Response to Comments

on the

Draft Environmental Analysis

Prepared for the

PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET



Released December 1, 2017
to be considered at the
December 14, 2017 Board Hearing

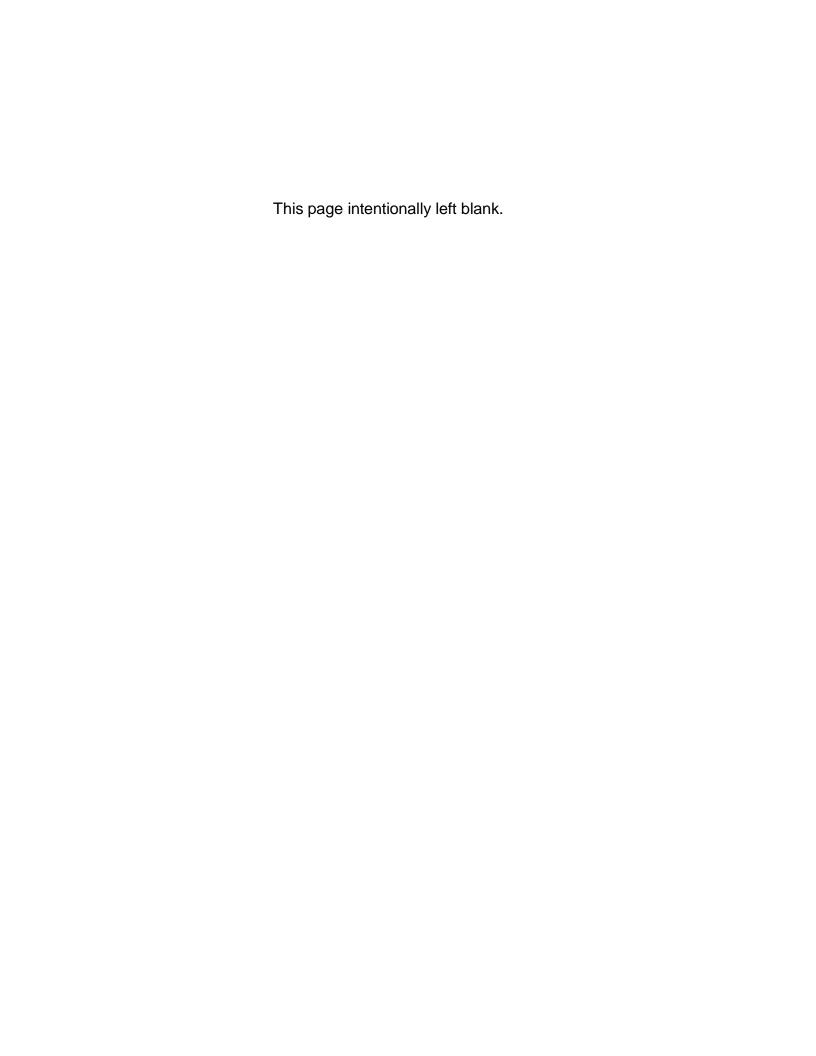


TABLE OF CONTENTS

PRE	FACE.		III
1.	INTR	ODUCTION	1-1
	1.1.	Requirements for Responses to Comments	1-1
	1.2.	Comments Requiring Substantive Responses	1-2
2.	RES	PONSES TO COMMENTS	2-1
Tabl	es		
		List of Comment Letters Requiring No Further ResponseList of Commenters	
	_		

This page intentionally left blank.

PREFACE

The California Air Resources Board (CARB) released a Draft Environmental Analysis (Draft EA) for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Scoping Plan) on January 20, 2017 for an 80-day public review and comment period that concluded April 10, 2017. A total of 223 comment letters were received on the Scoping Plan, 47 of which were determined to raise significant environmental issues related to the analysis in the Draft EA and are responded to in this document.

CARB staff made minor modifications to the Draft EA to create the Final EA. To facilitate identifying modifications to the document, modified text is presented in the Final EA with strike-through for deletions and <u>underline</u> for additions. None of the modifications alter any of the conclusions reached in the Draft EA, introduce new significant effects on the environment, or provide new information of substantial importance relative to the EA. As a result, these minor revisions do not require recirculation of the draft document pursuant to the California Environmental Quality Act (CEQA) Guidelines, California Code of Regulations, title 14, section 15088.5, before consideration by the Board.

This page intentionally left blank.

1. INTRODUCTION

The California Air Resources Board (CARB) released a Draft Environmental Analysis (EA) for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Scoping Plan) on January 20, 2017 for an 80-day public review and comment period that concluded April 10, 2017. CARB received numerous comment letters through the comment docket opened for the Scoping Plan, including the Draft EA, during that time. All of the comment letters are available for viewing on the comment docket on the CARB website at: https://www.arb.ca.gov/lispub/comm/bccommlog.php? listname=scopingplan2030.

CARB staff carefully reviewed all comment letters on the comment docket to determine which ones raised significant environmental issues related to the analysis in the Draft EA and require a written response under CARB's certified regulatory program implementing the California Environmental Quality Act (CEQA). This document includes CARB staff's written responses to that subset of comments, and it will be provided to the Board for consideration prior to it taking final action on the Scoping Plan.

The written responses include a brief summary of each comment, followed by the written response. The full comment letters from which the comments responded to were extracted are provided in Appendix A of this document. Although this document includes written responses only to those comments related to the Draft EA, all comment letters on the docket were considered by staff and provided to the Board members for their consideration.

Following consideration of the comments received on the Draft EA and during the preparation of the responses to those comments, CARB revised the Draft EA to prepare the Final EA released November 30, 2017 and presented as Appendix F to the final version of the Scoping Plan.

1.1. Requirements for Responses to Comments

These written responses to public comments on the Draft EA are prepared in accordance with CARB's certified regulatory program to comply with CEQA. CARB's certified regulations state:

California Code of Regulations, title 17 section 60007. Response to Environmental Assessment

(a) If comments are received during the evaluation process which raise significant environmental issues associated with the proposed action, the staff shall summarize and respond to the comments either orally or in a supplemental written report. Prior to taking final action on any proposal for which significant environmental issues have been raised, the decision maker shall approve a written response to each such issue.

Public Resources Code section 21091 also provides guidance on reviewing and responding to public comments in compliance with CEQA. While this section refers to environmental impact reports, proposed negative declarations, and mitigated negative

declarations, rather than an EA, it contains useful guidance for preparing a thorough and meaningful response to comments.

Public Resources Code section 21091, subdivision (d) states:

- (1) The lead agency shall consider comments it receives ... if those comments are received within the public review period.
- (2) (A) With respect to the consideration of comments received ..., the lead agency shall evaluate any comments on environmental issues that are received from persons who have reviewed the draft and shall prepare a written response pursuant to subparagraph (B). The lead agency may also respond to comments that are received after the close of the public review period.
- (B) The written response shall describe the disposition of each significant environmental issue that is raised by commenters. The responses shall be prepared consistent with section 15088 of Title 14 of the California Code of Regulations.

California Code of Regulations, title 14, section 15088 (CEQA Guidelines) also includes useful information and guidance for preparing a thorough and meaningful response to comments. It states, in relevant part, that specific comments and suggestions about the environmental analysis that are at variance from the lead agency's position must be addressed in detail with reasons why specific comments and suggestions were not accepted. Responses must reflect a good faith, reasoned analysis of the comments.

California Code of Regulations, title 14, section 15088 (a – c) states:

- (a) The lead agency shall evaluate comments on environmental issues received from persons who reviewed the draft EIR and shall prepare a written response. The Lead Agency shall respond to comments received during the noticed comment period and any extensions and may respond to late comments.
- (b) The lead agency shall provide a written proposed response to a public agency on comments made by that public agency at least 10 days prior to certifying an environmental impact report.
- (c) The written response shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the Lead Agency's position is at variance with recommendations and objections raised in the comments must be addressed in detail giving reasons why specific comments and suggestions were not accepted. There must be good faith, reasoned analysis in response. Conclusory statements unsupported by factual information will not suffice.

1.2. Comments Requiring Substantive Responses

CARB is required to prepare written responses only to those comments that raise "significant environmental issues" associated with the proposed action, as outlined in

California Code of Regulations, title 17, section 60007, subdivision (a). A total of 215 comment letters submitted on the one comment docket set up for the Scoping Plan and its appendices, including the Draft EA, an additional eight comment letters were received late after the close of the docket. Out of the 223 comments received, 47 comment letters were determined to include comments raising significant environmental issues related to the Draft EA and requiring a written response under CARB's certified regulatory program and CEQA. CARB staff was conservative and inclusive in determining which comments warranted a written response and even included comments that did not mention the Draft EA, but did raise an issue related to potential adverse impacts related to the Scoping Plan.

Below is a list of all the comment letters not responded to in this document. These comment letters were considered by CARB staff and provided to the Board members for their consideration. These comments are not responded to in this document because CARB staff determined they do not raise significant environmental issues related to the Draft EA and do not require a response under CARB's certified regulatory program and CEQA. Furthermore, the Scoping Plan is not subject to the requirements of the Administrative Procedures Act to prepare a Final Statement of Reasons with written responses to each issue, and there is no requirement in the Health and Safety Code, Assembly Bill (AB) 32, Senate Bill (SB) 32, or any other statute governing the preparation of the Scoping Plan that requires CARB to prepare written responses to each issue raised related to the Scoping Plan. Nonetheless, these comments are part of the record, were taken into consideration when CARB staff prepared the final Scoping Plan, and were provided to Board members for their full consideration before taking action on the Scoping Plan.

Tab	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
1	January 1, 2017	Walters, Damian,	Private Citizen	
2	January 21, 2017	Suhr, John,	Retired architect	
3	January 27, 2017	Mitrosky, Micah	IBEW Local 569	
4	January 29, 2017	Spraggins, Charles	4R Grandkids Campaign	
5	January 31, 2017	Davis, Al,	Private Citizen	
6	February 2, 2017	Wexler, Anthony	UC Davis	
7	February 7, 2017	Brennan, John,	Private Citizen	
8	February 7, 2017	Kauffman, Dr. George B.,	Fresno State	
10	February 7, 2017	Herring, Jason	Private Citizen	
11	February 7, 2017	Frost, Martin,	Stanford	
12	February 7, 2017	Miller, Don,	Private Citizen	
14	February 7, 2017	Gribben, Arthur,	Private Citizen	

Tab	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
15	February 7, 2017	Tischler, Jeffrey,	Private Citizen	
16	February 7, 2017	Forrest, Scott,	Private Citizen	
17	February 7, 2017	Mangels, Francis	UCS, Sierra, Audubon, NRDC,+20etc	
18	February 8, 2017	King, Kimberly	Out Think The Box	
19	February 8, 2017	Crass, Scott,	Private Citizen	
20	February 8, 2017	Baxel, Gary,	Private Citizen	
21	February 8, 2017	Blish, Richard	Spansion Sr Fellow, emeritus	
22	February 8, 2017	Nast, Carroll,	Private Citizen	
23	February 11, 2017	Solomon, PhD, Richard,	Retired	
25	February 16, 2017	Rosenberger Haider, Laura	Sierra Club, Fresnans Against Fracking	
26	February 16, 2017	Bourcier, William	Private citizen	
27	February 26, 2017	Silver, Dan	Endangered Habitats League	
28	March 1, 2017	Levine, Lloyd	CA Emerging Technology Fund	
29	March 3, 2017	Gavric, Jeli,	California Association of Realtors	
30	March 4, 2017	Cohen, Howard,	Private Citizen	
31	March 4, 2017	Booz, Martha,	Cal Natives	
32	March 5, 2017	Lewis, Sherman	Hayward Area Planning Association	
33	March 5, 2017	Levin, Julia	Bioenergy Association of California	
34	March 5, 2017	Lewis, Sherman	Hayward Area Planning Association	
35	March 6, 2017	Duncan, Mara,	Private Citizen	
36	March 6, 2017	Lane, Adam	Los Angeles Business Council	
37	March 6, 2017	Carland, Tristan Colban, Laura Bockman, Emily	Citizens Climate Lobby	
38	March 7, 2017	Clark, Margaret	Los Angeles County Waste Mgmt Task Force	

Tab	Table 1-1: List of Comment Letters Requiring No Further Response				
Comment Number	Date	Name	Affiliation		
39	March 8, 2017	Lewis, Sherman	Hayward Area Planning Association		
40	March 10, 2017	Bard, Jenny,	American Lunch Association, American Heart Association, Public Institute and Center for Climate Change and Health and California Public Health Association		
42	March 21, 2017	Brotman, Daniel,	Private Citizen		
43	March 21, 2017	Colban, Laura	Unitarian Universalist Fellowship of SD		
44	March 23, 2017	Kelly, Anne	Business for Innovative Climate and Energy Policy		
45	March 25, 2017	Piccinnno, Greg,	Private Citizen		
46	March 25, 2017	White, George,	Private Citizen		
47	March 26, 2017	Bohigian, Ronald	Private citizen		
48	March 28, 2017	Creasman, Mary	The Trust for Public Land		
49	March 28, 2017	Twight, Cedric	Sierra Pacific Industries		
50	March 30, 2017	Levine, Lloyd	Western Pavement Maintenance Assoc.		
51	April 2, 2017	London, Janelle	Menlo Park Environmental Quality Commission		
54	April 5, 2017	Townley, David	CTC Global Corporation		
55	April 5, 2017	Belden, David,	Private Citizen		
56	April 5, 2017	Pugsley, Arthur	Los Angeles Waterkeeper		
59	April 6, 2017	Kraus-Polk, Julian	Friends of the Earth - US		
61	April 7, 2017	Greene, Larry F.	Sacramento Metropolitan AQMD		
62	April 7, 2017	Hughes, Gary	Friends of the Earth - US		

Tab	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
63	April 7, 2017	Holmes-Gen, Bonnie, et al,	AMA, California ReLeaf, et al.	
64	April 7, 2017	Burns, Emily	Save the Redwoods League	
65	April 7, 2017	Mmagu, Amy	CalChamber	
66	April 7, 2017	Blacet, Danielle	California Municipal Utilities Association	
67	April 7, 2017	Zakreski, Sheldon	Climate Trust	
70	April 7, 2017	Anderson, Christa	Stanford University	
71	April 7, 2017	Hendrix, Michael, et al.	AEP Climate Change Committee	
72	April 7, 2017	Sullivan, Shelly	Climate Change Policy Coalition	
73	April 9, 2017	Scherzer, Dennis	East Palo Alto Sanitary District	
74	April 9, 2017	Trott, Chris	Yosemite Stanislaus Solutions (YSS)	
75	April 9, 2017	Larrea, John	CA League of Food Processors	
76	April 9, 2017	Silva-Send, Nilmini	Energy Policy Initiatives Center, USD	
77	April 10, 2017	Costantino, Jon	Ad Hoc Offsets Group	
78	April 10, 2017	Harlow, Robert	MVCAN Environmental Group	
79	April 10, 2017	Richards, Willard	Sonoma County Transportation & Land Use Coalition	
80	April 10, 2017	Passero, Michelle,	The Nature Conservancy	
81	April 10, 2017	Sedoryk, Carl G.	Monterey-Salinas Transit	
82	April 10, 2017	Mackenzie, Andrea	Open Space Authority, Santa Clara Valley	
83	April 10, 2017	Sommer, Wendy	StopWaste	
86	April 10, 2017	McRae, Tim	Silicon Valley Leadership Group	
87	April 10, 2017	Gordon, Deborah	Carnegie Endowment for International Peace	

Tab	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
88	April 10, 2017	Cohen, Jeff	EOS Climate	
90	April 10, 2017	Sandler, Mike	Carbon Share	
91	April 10, 2017	Franklin, Rebecca	Association of California Water Agencies	
92	April 10, 2017	Beaudin, Livia	Coast Law Group	
94	April 10, 2017	Phillips, Kathryn	Sierra Club California	
95	April 10, 2017	Schmelzer, Jason	Shaw / Yoder / Antwih, Inc.	
96	April 10, 2017	Hong, Suzy	USS-POSCO Industries	
97	April 10, 2017	Vesser, Barry	Center for Climate Protection	
98	April 10, 2017	Rastogi, Sanjeev	Honeywell International Inc.	
99	April 10, 2017	Marvin, David, et al.	Carnegie Institution for Science	
100	April 10, 2017	Meinzen, Stacey	Center for Climate Protection	
102	April 10, 2017	Rollins, Richard,	Private Citizen	
103	April 10, 2017	Samuelson, Paul	Mill Valley CAN	
106	April 10, 2017	Tutt, Eileen Wenger	CalETC	
107	April 10, 2017	Sirna, Tony	Californians for a Carbon Tax	
108	April 10, 2017	Mainland, Edward	Private Citizen	
110	April 10, 2017	McCoard, David, Mr.	Private Citizen	
111	April 10, 2017	Samuelsen, Scott	NATIONAL FUEL CELL RESEARCH CENTER	
113	April 10, 2017	Pfeffer, Nancy	Gateway Cities Council of Governments	
114	April 10, 2017	Fort, Jeffrey	Dentons US LLP	
115	April 10, 2017	Rege, Julia	Association of Global Automakers	
116	April 10, 2017	Hamilton, Katherine	Advanced Energy Management Alliance	
117	April 10, 2017	Parfrey, Jonathan	Climate Resolve	
118	April 10, 2017	Broome, Claire	Adjunct Professor Public Health, Emory	

Tab	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
			University School of Public Health	
119	April 10, 2017	Stoll, Charles "Muggs"	SANDAG	
124	April 10, 2017	Jones, Todd	Center for Resource Solutions (CRS)	
125	April 10, 2017	Vessels, Thomas	Vessels Coal Gas, Inc.	
126	April 10, 2017	Zimmerman, Bill	Western Placer Waste Management Authority	
127	April 10, 2017	Estrada, Torri	Carbon Cycle Institute	
128	April 10, 2017	Rai, Amisha	Advanced Energy Economy (AEE)	
129	April 10, 2017	Upadhyay, Deven N.	Metropolitan Water District of Southern California	
130	April 10, 2017	Holmes-Gen, Bonnie	American Lung Association in California	
131	April 10, 2017	Gentry, George,	CalForests, California Forestry Association	
132	April 10, 2017	McHugh, Jon,	McHugh Energy	
133	April 10, 2017	Sedlacek, Mark	LADWP	
134	April 10, 2017	Shaw, Joshua	California Transit Association	
135	April 10, 2017	Hooven, Cody	City of San Diego	
136	April 10, 2017	Paul, Iliana	Institute for Policy Integrity	
137	April 10, 2017	Stewart, PhD, Jim,	Private Citizen	
138	April 10, 2017	Wagoner, James	CAPCOA	
140	April 10, 2017	Stewart, PhD, Jim,	Private Citizen	
141	April 10, 2017	Moran, Ralph,	BP America, Inc.	
142	April 10, 2017	Stewart, PhD, Jim,	Private Citizen	
143	April 10, 2017	Mills, Laurel,	Private Citizen	
144	April 10, 2017	Stewart, PhD, Jim,	Private Citizen	
145	April 10, 2017	Bengtsson, Nathan	Pacific Gas and Electric Company	
146	April 10, 2017	White, Erik	Placer County APCD	

Tab	Table 1-1: List of Comment Letters Requiring No Further Response				
Comment Number	Date	Name	Affiliation		
148	April 10, 2017	Roy, Toby,	San Diego County Water Authority		
151	April 10, 2017	Lister, Elaine	City of Mission Viejo		
153	April 10, 2017	Zuretti, Steve	Brookfield Renewable		
154	April 10, 2017	Wayburn, Laurie	Pacific Forest Trust		
157	April 10, 2017	Madson, Diana	Sierra Business Council		
158	April 10, 2017	Smith, Steve,	San Bernardino COG/San Bernardino CTA		
159	April 10, 2017	Frisch, Steve	Sierra Business Council		
161	April 10, 2017	Welch, V,	Nest Labs., Inc/John Manville		
162	April 10, 2017	Stromberg, Janet	350 Bay Area		
163	April 10, 2017	Payne, Kenneth	El Dorado County Water Agency		
164	April 10, 2017	Giffen, Jason H,	Unified Port of San Diego		
165	April 10, 2017	Westerfield, William	SMUD		
168	April 10, 2017	Carmichael, Tim	SoCalGas		
169	April 10, 2017	Martin, Ronald, Fresnans against Fracking	Private Citizen		
170	April 10, 2017	Merrill, Jeanne	CA Climate & Agriculture Network (CalCAN)		
171	April 10, 2017	Taheri, Sarah	Southern Calif. Public Power Authority		
173	April 10, 2017	Rosenberger Haider, Laura	Fresnans Against Fracking		
174	April 10, 2017	Smith, Cherylyn	Fresnans Against Fracking		
176	April 10, 2017	Lindblad, Bryn	Climate Resolve		
177	April 10, 2017	Cullenward, Danny	Near Zero		
178	April 10, 2017	Peridas, George,	An Energy Policy Coalition (Shell, Stanford, OXY, Clean Air Task Force)		
179	April 10, 2017	Busch, Chris	Energy Innovation		

Tabl	Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation	
180	April 10, 2017	Deslauriers, Sarah	CA Association of Sanitation Agencies	
181	April 10, 2017	Schuchard, Ryan	CALSTART	
182	April 10, 2017	Lyon, Richard	Ca building Industry Assn	
183	April 10, 2017	Nowicki, Brian	Center for Biological Diversity	
184	April 10, 2017	Evans-Fudem, Erin	League of California Cities	
185	April 10, 2017	Nowicki, Brian	Center for Biological Diversity	
186	April 10, 2017	Nowicki, Brian	Center for Biological Diversity	
187	April 10, 2017	Berlin, Susie	Northern California Power Agency (NCPA)	
188	April 10, 2017	Carmichael, Tim	San Diego Gas & Electric Company	
189	April 10, 2017	Mortazavi, Kia	Orange County Transportation Authority	
193	April 10, 2017	Hopper, Martin	M-S-R Public Power Agency	
194	April 10, 2017	Purcell, Leslie,	Private Citizen	
195	April 10, 2017	Smalley, Ted	SJCOG	
196	April 10, 2017	Eder, Harvey	Public Solar Power Coalition	
197	April 10, 2017	Wick, John,	Marin Carbon Project	
198	April 10, 2017	Martin, Ronald	Fresnans against Fracking	
199	April 10, 2017	Dietrick, Jan	Dietrick Institute Applied Insect Ecology	
200	April 10, 2017	Eder, Harvey	Public Solar Power Coalition	
201	April 10, 2017	Fletcher, Chanell	ClimatePlan	
205	April 10, 2017	Aird, Sarah,	Pesticide Action Network	
206	April 10, 2017	Okuye, Jean	Valley Land Alliance	
207	April 10, 2017	Bettis, Rick	Private Citizen	

Table 1-1: List of Comment Letters Requiring No Further Response			
Comment Number	Date	Name	Affiliation
208	April 20, 2017	Broadbent, Jack	BAAQMD
Hearing-1	January 27, 2017	Arguello, Martha Dina	Environmental Justice Advisory Committee
Hearing-2	January 27, 2017	Bushnell, James	University of California, Davis
Hearing-3	February 3, 2017	Edgar, Evan	CA Compost Coalition
Hearing-4	February 3, 2017	Levine, Lloyd	CA Emergency Tech. Fund
Hearing-5	February 3, 2017	Chu, Betty	Calpine Corporation
Hearing-6	February 16, 2017	Hughes, Gary	Friends of the Earth
Hearing-7	February 16, 2017	Rynearson, Gary C	Green Diamond
Late-4	April 12, 2017	Tim Carmichael	San Diego Gas and Electric Company
Late-5	April 12, 2017	Timothy J. Haines	State Water Contractors
Late-6	April 14, 2017	Nigel Ravencroft	Owens Corning

California Air Resources Board – 2017 Scoping Pla	n
Response to Comments	

Introduction

This page intentionally left blank.

2. RESPONSES TO COMMENTS

The comment letters responded to in this document were coded by the order in which they were received. Table 2-1 provides the list of comment letters that contain substantive environmental comments. Responses to these comments are provided below. Comment letters, bracketed to indicate individual comments, are provided in Appendix A.

Table 2-1: List of Commenters			
Comment Number	Date	Name	Affiliation
9	February 7, 2017	Monroe, James	Private Citizen
13	February 7, 2017	Gray, Richard	350 Bay Area
24	February 15, 2017	Edgar, Evan W.R.	California Compost Coalition
41	March 15, 2017	Delaney, Tracy	Public Health Alliance of Southern CA
52	April 3, 2017	Afshari, Shari	County of Los Angeles, Department of Public Works
53	April 5, 2017	Gibson, Jamesine Rogers	Union of Concerned Scientists
57	April 6, 2017	DiPerna, Rob	EPIC
58	April 6, 2017	DiPerna, Rob	EPIC
60	April 6, 2017	Ikhrata, Hasan	SCAG
68	April 6, 2017	Shuman, Todd	WUMU
	April 7, 2017	Shuman, Todd	WUMU
69	April 7, 2017	Bayless, Samuel	CIOMA
84	April 10, 2017	Mork, Eric	EBR Development, LLC
85	April 6, 2016	McGaraghan	Energy Solutions
89	April 10, 2017	Scow, Adam	Food & Water Watch
93	April 10, 2017	Schonbrunn, David	Transportation Solutions Defense and Education Fund
101	April 10, 2017	Parfrey, Jonathan	Alliance of Regional Collaboratives for Climate Action
104	April 10, 2017	Clark, Margaret	LA County Solid Waste Management Committee
105	April 10, 2017	Reheis-Boyd, Catherine	Western States Petroleum Association
109	April 10, 2017	Kotlier, Bernie	IBEW-NECA

Table 2-1: List of Commenters				
Comment Number	Date	Name	Affiliation	
112	April 10, 2017	Bloom, John	Coalition for Sustainable Cement Manufacturing & Env.	
121	April 10, 2017	Koehler, Larissa	Environmental Defense Fund	
122	April 10, 2017	Vanderwarker, Amy	CA Environmental Justice Alliance	
123	April 10, 2017	Bullock, Mike	Private Citizen	
139	April 10, 2017	Golden, Rachel	Sierra Club	
147	April 10, 2017	May, Julia	Communities for a Better Environment	
149	April 10, 2017	Secundy, Jerry	CCEEB	
152	April 10, 2017	Bundy, Kevin	Center for Biological Diversity	
155	April 10, 2017	Arguello, Martha	Private Citizen	
156	April 10, 2017	Hughes, Gary	Friends of the Earth	
160	April 10, 2017	Rudolph, Linda	Center for Climate Change and Health	
166	April 10, 2017	Newell, Brent	Center on Race, Poverty & the Environment	
167	April 10, 2017	Weiskopf, David	Nextgen Climate America	
172	April 10, 2017	Martinson, Cara	California State Association of Counties	
175	April 10, 2017	O'Brien, Rachel	Agricultural Council of California	
190	April 10, 2017	Edgar, Evan	CA Compost Coalition	
191	April 10, 2017	Severson, Dan	Private Citizen	
192	April 10, 2017	Haya, Barbara	Berkeley Energy & Climate Institute	
202	April 10, 2017	Daryanani, Nikita	n/a	
203	April 10, 2017	Fletcher, Chanell	ClimatePlan	
204	April 10, 2017	Newell, Brent	Center on Race, Poverty & the Environment	
Late Comments				
Late 1	4/10/2017	Morgan, Ken	Tesla	
Late 2	4/10/2017	Jaktkar, Shrayas	Coalition for Clean Air	

Table 2-1: List of Commenters				
Comment Number	Date	Name	Affiliation	
Late 3	4/10/2017	Wilson, Dawn	Southern California Edison	
Late 7	10/17/2017	Clark, Margaret	LA County Solid Waste Management Committee	
Late 8	11/22/2017	Phillips, Kathryn	Sierra Club California	
Public Hearings				
EJAC Meeting	2/15/2017	N/A	N/A	

Master Response 1: Response to Comments Raising Cap-and-Trade Measure Related Environmental Justice Concerns

Comment:

Several commenters express concern about the impact of the Cap-and-Trade measure on environmental justice communities. Some comments assert that many industrial facilities covered by the Cap-and-Trade program have had increases in localized GHG emissions and that the Cap-and-Trade program is likely to push emissions toward disadvantaged areas because it does not provide limits on individual facilities or areas. Commenters are also concerned that the Cap-and-Trade Program could allow for increases in toxic emissions to be disproportionately distributed toward already disproportionately impacted communities. Commenters cite a 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) Some comments state that the Proposed Plan fails to discuss this report, and that the report demonstrates that the Cap-and-Trade Program disparately affects communities of color and denies communities the benefits of on-site reductions, and that GHG reductions attributed to Cap-and-Trade occur primarily outside of California.

This response is a "master response" to these comments since several commenters expressed similar concerns. Those comments are also individually addressed, as appropriate, below.

Response:

Introduction

These comments are regarding concerns about potential air quality impacts to disadvantaged communities regarding one particular recommended measure within the Scoping Plan and not regarding the impacts of the Scoping Plan as a whole. The post 2020 Cap-and-Trade measure underwent its own more detailed process under the Administrative Procedures Act and under CARB's certified regulatory program, which included a more focused environmental document. The Board approved amendments to the Cap-and-Trade Regulation on July 27, 2017, which established a framework for a post-2020 Cap-and-Trade Program, among other changes. CARB also included, as part of its approval, a recognition that additional regulatory amendments will be required through a new rulemaking process to implement the requirements of recently enacted Assembly Bill 398 (AB 398, Chapter 135, Statutes of 2017) for the post-2020 Cap-and-Trade Program. Any future changes to that regulation would undergo the same rigorous and open process that includes technical, environmental, and economic analyses, and public review and input specific to that proposal.

The level of detail in the Draft EA prepared for the Scoping Plan reflects that it is a broad statewide-level planning document. The Draft EA analysis, summarized below, is at a programmatic level and does not provide the level of detail presented in subsequent environmental documents prepared for specific regulatory actions that

CARB or other agencies pursue or for specific construction projects by various entities to comply with regulations or policies in the plan. (Cal. Code Regs., tit. 14, § 15168.)

Draft EA Analysis

The Draft EA in section 3.b discusses the longer term operational impacts to air quality reasonably foreseeable from implementation of the Scoping Plan. That section of the Draft EA points to the AB 197 estimated ranges for potential GHG, criteria, and toxics emissions evaluated in developing the Scoping Plan. As stated in the Draft EA, the modeling estimates for the AB 197 emissions show that the Scoping Plan measures reduce GHG, NOx, VOC, and PM_{2.5} emissions as part of long-term operations in 2030. The Draft EA explains that the overall Scoping Plan air quality impact, looking at the measures as a whole, is substantially driven by the fact that reducing GHGs from across the economy also results in significant co-pollutant reductions. It further states on page 69: "The AB 197 estimates for the specific measures, included in the Proposed [Scoping] Plan, all show that directionally there will be decreases in criteria air pollutants and [toxic air contaminants (TACs)] in the year 2030. Since each measure is expected to result in GHG reductions each year between 2021 and 2030, each year should also see a reduction in criteria air pollutants and TACs even though not explicitly estimated in the plan."

The Draft EA also includes a summary analysis of the air quality impacts associated with the compliance responses for each of the proposed measures, including the Capand-Trade measure. Section 3.b.vi states in part: "The 2010 FED considered the possibility that some covered entities might increase operation of specific equipment, which could increase local emissions. Compliance obligations under the Cap-and-Trade program have only been effective since January 1, 2013. Because ARB has received so few years of reported data to date, ARB lacks sufficient information to conclude with certainty that localized emissions increases have not occurred. While ARB continues to believe, in part based on its analysis detailed below, that resulting localized air impacts are extremely unlikely..." After the summary discussion for each measure, the Draft EA concludes that overall the Scoping Plan measures would result in a beneficial impact to air quality through overall reductions in emissions of criteria air pollutants and TACs from the measures. The Draft EA states the potential for some adverse air quality impacts associated with some specific individual measures in isolation is conservatively disclosed at the Draft EA programmatic level. The Draft EA explains that pending further design of particular measures, which would and should reduce these potential impacts to a less-than-significant level, is part of the process of the later implementation phase for measures developed. It also states: "Further, though the programmatic level of this analysis necessarily limits source-specific or fine-grained regional analyses, it is important to note that the measures identified here would be implemented, as appropriate, only after further regulatory, permitting, and or other evaluation processes. Future measure-specific CEQA analyses and mitigation requirements, along with the substantive requirements of state and federal air pollution law will require these measures to be implemented in ways consistent with the local, state, and federal mandates that ensure compliance with ambient air quality and TAC programs statewide, and in each region of the state."

The comments related to air quality and disadvantaged communities are more directed at the Cap-and-Trade measure and not the Scoping Plan air quality analysis, and although the Cap-and-Trade measure has undergone its own separate environmental review process specific to that regulation, a summary response to those concerns is provided below for completeness.

Additional details regarding the Cap-and-Trade rulemaking process may be found on the Cap-and-Trade rulemaking page at https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm, including more detailed responses to environmental comments raised regarding that regulatory proposal.

Cap-and-Trade Measure

Several commenters contend that the Cap-and-Trade Program either causes or has the potential to cause localized emissions increases that impact disadvantaged communities. CARB disagrees with commenters' contentions regarding localized emissions increases potentially caused by the Cap-and-Trade Program. As explained in greater detail in the Environmental Analysis prepared for the Cap-and-Trade Regulation, incorporated by reference herein, continuing the Cap-and-Trade Program after 2020 involves more ambitious emissions reduction mandates, which are expected to produce dramatic reductions in GHG emissions and likely criteria pollutant emissions across industrial, energy and transportation sectors covered by the Cap-and-Trade Program.

Several comments reference a September 2016 paper entitled "A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program" (Research Brief)³ to support their contentions. CARB disagrees that this Research Brief supports these contentions. First, the Research Brief is a preliminary research effort with initial conclusions. The "Overview" section on page 1 of the Research Brief states: "[f]urther research is needed before firm policy conclusions can be drawn from this preliminary analysis." Second, the Research Brief states: "[a]s regulated industries adapt to future reductions in the emissions cap, California is likely to see more reductions in localized GHG and co-pollutant emissions." (Research Brief at 10.) The Research Brief does not conclude that localized emissions in disadvantaged communities are *increasing due to the Cap-and-Trade Program*. Thus, the Research Brief does not adequately explain how changes in GHG emissions at covered sources result in local exposure to any co-

¹ Available at https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm,

² "Criteria pollutants" refers to the pollutants for which U.S. EPA has established national ambient air quality standards, which are ground-level ozone, carbon monoxide (CO), particulate matter (PM), lead, sulfur dioxide (SOx), and nitrogen dioxide (NOx).

³ Lara J. Cushing, Madeline Wander, Rachel Morello-Frosch, Manuel Pastor, Allen Zhu, and James Sadd, Research Brief: A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (September 2016), available at

http://dornsife.usc.edu/assets/sites/242/docs/Climate Equity Brief CA Cap and Trade Sept2016 FINA L2.pdf.

pollutant increases. The overall thrust of the Research Brief is that more can be done through modifications to the Cap-and-Trade Program to enhance benefits to disadvantaged communities.

Fourth, the Research Brief does not identify adverse environmental impacts resulting from the Cap-and-Trade Program as claimed by some commenters. A CEQA analysis must identify and focus on the "significant environmental effects" of the proposed project. (Pub. Resources Code § 21100(b)(1); 14 CCR § 15126(a), 15143.) A significant effect on the environment is defined as "a substantial, or potentially substantial, adverse change in the environment." (Pub. Resources Code § 21068 [italics added].) A proposed project that foregoes potential air quality benefits, but causes no significant increase in emissions above the environmental baseline, is not a CEQA impact because the project does nothing to adversely change the existing environmental conditions.

Finally, the Research Brief does not account for several important macroeconomic and electricity sector factors that could explain emissions increases independent of the Capand-Trade Program. For example, in 2011-2012, the economy was still under the influence of the recession and production was lower compared to the 2013-2014 period. The emissions increases in 2013-2014 were likely due to production returning to prerecession levels. Further, electricity sector emissions may have increased in 2013-2014, compared to 2011-2012, because of the increased dispatch of natural gas-fired power plants due to: (1) decreased hydroelectricity production because of California's historic drought, which started after 2011; and (2) the closure of the San Onofre Nuclear Generating Station (SONGS) in 2012. Given these factors that could be driving emissions increases, it is too early to draw conclusions regarding the specific effect of the Cap-and-Trade Program on criteria pollutant emissions at any specific source.

The other report referenced by some commenters was prepared by the Office of Environmental Health and Hazard Assessment (OEHHA). In December 2015, the Governor issued a directive that OEHHA issue a report analyzing the benefits and impacts within disadvantaged communities of the GHG emissions limits adopted by CARB and to continue updating that report every three years. In February 2017, OEHHA issued its initial report in response to this directive titled "Initial Report on Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities" (OEHHA Initial Report). The report concluded there is not enough emissions data available yet to allow for a comprehensive and conclusive analysis. OEHHA's preliminary findings confirm that a disproportionate number of large industrial facilities are in or close to disadvantaged communities, and it identified paths forward to acquire a range of data to identify and track any emissions increases that could be attributable to the Cap-and-Trade Program. Consistent with the Governor's directive, OEHHA indicates that it will also evaluate other AB 32 programs besides the Cap-and-Trade Program.

⁴ Available at https://oehha.ca.gov/environmental-justice/report/ab32-benefits.

Several commenters also claim that emissions reductions under the Cap-and-Trade Program are mostly from offsets, and particularly out-of-state offsets. CARB staff notes that the CARB GHG Inventory, which is the critical tool used to track reductions that meet the statewide GHG target, includes in-state smokestack, tailpipe, and emissions associated with imported power to serve California load. Use of offsets (in-state or outof-state) in the Cap-and-Trade Program is not used to track the State's progress towards achieving its statewide GHG target. When comparing the actual GHG emissions that are covered under the Cap-and-Trade Program, without any adjustments for offsets, covered entity emissions are under the caps in the program. And, as the Cap-and-Trade Program covers approximately 85 percent of the GHG emissions in the State and given that the caps decline annually, there will be direct emissions reductions from those sources. These covered sources include large stationary facilities (manufacturing, refineries, power plants, and cement plants), mobile sources, and emissions associated with imported electricity to serve California load. Additionally, recently enacted AB 398 is pertinent to the concerns raised by commenters. AB 398 requires CARB to develop regulations reducing the quantitative usage limit for offsets, and requires one half of offsets within that limit to confer direct environmental benefits to the state, from the period of January 1, 2021 to December 31, 2030. AB 398 also establishes a Compliance Offsets Protocol Task Force to provide guidance to CARB in approving new offset protocols for the purpose of increasing offset projects with direct benefits within the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions.

In addition, and contrary to several commenters' claims, all offsets utilized as part of the Cap-and-Trade Program are real, additional, permanent, verifiable, quantifiable, and enforceable, as required by AB 32. CARB has developed rigorous offset quantification methods that incorporate the AB 32 criteria and ensure any offset issued and used in the Program meets these criteria. Importantly, CARB's method of implementing the statute with respect to offsets was upheld by the First District Court of Appeals in *Our Children's Earth Foundation v. ARB* (2015) 234 Cal. App. 4th 870.

An important context to remember regarding these comments is that the Cap-and-Trade Program is designed to primarily address GHGs, not criteria and toxics air pollutants. However, to the extent actions are taken to improve onsite efficiency and reduce the combustion of fossil fuels, the Cap-and-Trade Program will likely drive GHG and criteria and toxic emission reductions co-benefits. CARB has also tried to ensure that the program does not lead to any unanticipated localized air quality impacts and it continues to satisfy AB 32 requirements. In 2011, as part of the original Cap-and-Trade Program rulemaking, CARB adopted an Adaptive Management Plan to help assess and address unlikely but potential localized air quality impacts resulting from the Cap-and-Trade Program. With Assembly Bill 197, CARB will continue to assess greenhouse gas reduction measures, including the Cap-and-Trade Program, and any potential impact on criteria pollutants or toxic air contaminant emissions. To ensure transparency in how emissions are changing at the covered entities, CARB provides annually reported and verified GHG emissions data, issuance data for offsets that includes location and offset type, and how entities comply with the program with allowances and the use of offsets.

This data will continue to be made publicly available as the program continues, fostering more informed analysis regarding emissions changes at both facility and regional levels.

State Air Quality Programs

Although the Cap-and-Trade Program's potential effects on criteria pollutant and toxics emissions were considered during the design of the regulation, that program does not directly regulate criteria pollutant and toxic emissions from specific stationary sources.⁵

Facilities covered by the Cap-and-Trade Program are required to hold permits to construct and to operate issued by the local air districts consistent with state and federal criteria and toxic pollution standards. These permit limits, which must also be consistent with attainment planning needs for state and federal ambient air quality standards, are designed to ensure that sources cannot emit above levels protective of public health. Any significant emissions increases at these facilities beyond permit levels must be authorized under the permits issued by the local air districts. CARB does not and cannot permit higher emissions at any facility, and cannot cause emissions to exceed permit limits. CARB also does not revise these permits to decrease emissions of toxics and criteria pollutants. Only the air districts have the authority to directly issue permits addressing a facility's criteria pollutant and toxics emissions levels. These levels are set after careful permit review, under district regulation and statute. Major stationary sources, of the sort covered by the Cap-and-Trade Program, generally must control permitted levels of criteria pollutant emissions consistent with at least the Best Available Control Technology (BACT), as defined in permitting regulations. This BACT analysis, and related analyses, are designed to ensure continued public health protection. Similarly, these major sources are subject to stringent air toxics permitting requirements as well, which generally require Maximum Achievable Control Technology (MACT) for toxics. CEQA review also may apply to these permits, and the air districts may require certain high priority facilities to prepare health risk assessments regarding hazardous substances. If a health risk assessment indicates a significant risk associated with the facility's emissions, the facility must conduct an airborne toxic risk reduction audit and develop a plan to implement airborne toxic risk reduction measures that will cause the reduction of emissions from the facility to a level below the significant risk level within five years. Moreover, recently enacted AB 617 also requires districts, via a public process, to adopt an expedited schedule for implementing best available retrofit control technology (BARCT) for sources subject to the Cap-and-Trade Program by January 1, 2019. This schedule will give the highest priority to those emission units that have not had the emissions-related conditions in their permits modified for the greatest period of time.

⁵ AB 32 requires ARB to satisfy several requirements in adopting regulations under AB 32, including ensuring that activities undertaken to comply with the regulations do not disproportionately impact low-income communities; ensuring that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions; and considering overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health. (See Health & Safety Code § 38562(b).)

Besides local air district permitting, criteria and toxic emissions controls are regulated under the State's traditional air pollution regulations. For many decades, the State has implemented numerous policies and programs to address and reduce criteria and toxic air pollutants and significant progress has been made in reducing diesel particulate matter (PM) and many other hazardous air pollutants. The key air quality strategies being implemented and included in the Scoping Plan include the State Implementation and Strategy, Sustainable Freight Action Plan. There is also the Diesel Risk Reduction Plan and AB 1807 (which requires CARB to use certain criteria in prioritizing the identification and control of air toxics), and the AB 2588 Air Toxics "Hot Spots" Program. To support efforts to advance the State's toxics program, OEHHA finalized a new health risk assessment methodology on March 6, 2015 and CARB is collaborating with air districts in the review of the existing toxics program under AB 2588 to strengthen the program.

Additionally, newly-enacted AB 617 directs and authorizes CARB to take several actions to improve data reporting from facilities, air quality monitoring, and pollution reduction planning for communities affected by a high cumulative exposure burden. With regard to reporting, it requires CARB to develop a uniform statewide annual reporting system of criteria pollutants and toxic air contaminants for certain categories of stationary sources. As for monitoring, it requires CARB to prepare a monitoring plan by October 1, 2018. Via a public process, this plan would identify the highest priority locations around the state to deploy community air monitoring systems. By July 1, 2019, any district containing a high priority location would need to deploy a community air monitoring system for that location or locations. The districts would also have authority to require nearby facilities to deploy a fenceline monitoring system under certain conditions. These efforts will help better understand the complex emissions interrelations between the Cap-and-Trade Program and air district criteria and toxics programs.

Finally, with regard to planning, AB 617 also requires CARB to prepare, in consultation with numerous stakeholders (including environmental justice organizations), a statewide strategy to reduce emissions of toxic air contaminants and criteria air pollutants in communities affected by a high cumulative exposure burden. This strategy must be prepared by October 1, 2018. The strategy would select locations around the state for preparation of community emissions reduction programs, which would then be adopted by the air districts and implemented after CARB review.

Conclusion

As summarized above, the Draft EA's conclusion that overall the Scoping Plan will lead to beneficial air quality impacts is appropriate, reasonable, and supported by substantial evidence in the record. The overall decline in greenhouse gas emissions that will be associated with the programmatic project discussed in the Draft EA will be accompanied with co-benefit reductions in criteria and toxic pollutants. Moreover, with regard to the Cap-and-Trade measure specifically – although measure-specific analysis is not required at the programmatic level of this analysis – the record and the structure of state air pollution law support a conclusion that this measure will not adversely affect air

California Air Resources Board – 2017 Scoping Plan Response to Comments

Responses to Comments

quality. Nonetheless, CARB conservatively assessed such impacts in the separate CEQA process for amendments to that measure. For the purposes of this programmatic analysis, there is substantial evidence that overall air pollution benefits will result from implementation of the Scoping Plan project as a whole. No changes to the Draft EA are required in response to these comments.

Comment Letter 9	Monroe, James
2/7/2017	

9-1

The commenter expresses concern related to emission rates from autonomous vehicles (AVs). Autonomous vehicles are currently undergoing testing and development, but are rarely used throughout the State. While they are mentioned as part of the Mobile Sources Strategy, which is discussed programmatically in the Draft EA, the extent and type of future AV use and their potential effect on emissions are currently not known and therefore too speculative to be discussed in the Draft EA.

Please also see response to comment 53-1.

This comment does not address the adequacy, accuracy, or completeness of the Draft EA and no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter 13	Gray, Richard
2/7/2017	350 Bay Area

13-1

The comment states that refineries must have their emissions capped and that operation, expansion, or production capacity increases should not be permitted.

Please see response to comment 105-4.

The impacts on air quality of operation, expansion, or production capacity increases are addressed in the Draft EA as discussed on page 66 of the Draft EA:

"In addition, stationary source emissions associated with transportation fuel production would be subject to local rules and regulations (e.g., authority to construct and permit to operate requirements) and, consequently, would not be approved by local air districts if emissions were to exceed designated levels for attaining and maintaining ambient air quality standards, and/or exceed acceptable risk levels for toxic exposure."

This comment does not address the adequacy, accuracy, or completeness of the Draft EA and no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter 24	Edgar, Evan W.R.
2/6/2017	California Compost Coalition

Overall, this commenter supports the Scoping Plan and expresses support for composting and anaerobic digestion to achieve the goals of the Scoping Plan and the Short-Lived Climate Pollutant Strategy. Specific sections of the letter mentioning the Draft EA are responded to below.

24-1

This portion of the comment contains a quote of a Draft EA section that discusses the reasonably foreseeable compliance responses for the Cap-and-Trade measure within the impacts discussion for Agricultural and Forest Resources. The comment includes a quote from a Draft EA section, but does not include any specific comments regarding the adequacy of the Draft EA related to the quoted text. It appears the commenter extracted this Draft EA section to suggest that compost use and biochar use should be developed as a Cap-and-Trade Offset Protocol. This comment is noted as a suggestion regarding the future development of a particular measure within the Scoping Plan as it does not otherwise raise any issues pertaining to the adequacy of the Draft EA. Any future rulemaking to amend the Cap-and-Trade Regulation would include its own more detailed process under the Administrative Procedures Act and under CARB's certified regulatory program, which includes a more focused environmental document where required. . Comments related to the design of that regulation, including the potential for new offset protocols is more appropriately addressed in that rulemaking process. Additional details on the most recently approved amendments to the Cap-and-Trade Regulation are available at the Cap-and-Trade rulemaking page at https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

24-2

The comment contains a quote from a Draft EA section that discusses the significance of impacts to agricultural and forest resources, but the comment does not include any specific comments regarding the adequacy of the Draft EA related to the quoted text. The comment appears to have included this section of the Draft EA to support the commenter's recommendation for CARB to develop an offset protocol for compost use within the post-2020 Cap-and-Trade Program. Please refer to response to comment 24-1. No changes to the Draft EA are required in response to this comment.

24-3

This comment includes an extracted section of the Draft EA related to the Short-Lived Climate Pollutant (SLCP) measure, and states that the Draft EA needs to recognize baseline conditions for organic waste practices such as landfilling when assessing the emissions from composting and anaerobic digestion facilities. As discussed in the Draft EA, the reasonably foreseeable compliance responses associated with the SLCP measures include development of expanded organic material composting and/or digesting facilities. As noted by the commenter, Impact 3.b discusses at a broad

Responses to Comments

programmatic level the potential for air quality impacts related to these facilities against the backdrop of existing conditions. CARB staff notes that the SLCP Strategy approved by the Board included its own environmental document. Please refer to this page for more information on that document and its findings: https://www.arb.ca.gov/cc/shortlived/shortlived.htm.

The analysis of the potential adverse environmental impacts in the Draft EA reflects that the Scoping Plan is a broad statewide-level planning document, and the Draft EA looks at all the proposed measures in the Scoping Plan cumulatively. The Draft EA cannot predict the specifics of particular measures to be developed if the plan is adopted, provide the project level type analysis for potential new composting facilities that may be built in response to a particular measure, or compare the net benefits for criteria pollutants compared to existing landfills in particular areas of the state for particular facilities. The Scoping Plan, and the Draft EA, do recognize the net benefits to GHG reductions because the SLCP measures are included in the Scoping Plan. But because the specific location for potential new composting facilities cannot be known at this stage, baseline emissions and the comparative benefits to criteria pollutants are too speculative to be analyzed in this Draft EA. The Draft EA takes a conservative approach and discloses the potential for criteria pollutant emissions increases at a programmatic level to avoid any risk of understating potential impacts. It is expected that many of these impacts can be avoided or mitigated to less that significant levels during review of specific development projects undertaken to implement recommended measures in the Scoping Plan, including the SLCP measures. No changes to the Draft EA are required in response to this comment.

24-4

The comment states that the Draft EA needs to recognize the net benefit of both GHG reductions and criteria pollutants could be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities. Please see response to comment 24-3.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter 41	Delaney,Tracy
3/10/2017	Public Health Alliance of Southern CA

41-1

The comment recommends an analysis of public health impacts of the Scoping Plan and states that CEQA requires that public projects that may cause substantial adverse effects on human beings directly or indirectly, must prepare an EA that discusses health and safety problems caused by the physical changes. The CEQA Guidelines require that a "lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions may occur:

- 1) The project has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory.
- 2) The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- 3) The project has possible environmental effects that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.
- 4) The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly (Cal. Code Regs., tit. 14, § 15065)."

These mandatory findings of significance are provided in chapter 6 of the EA. The discussion includes effects on human beings, stating as follows:

CEQA requires a lead agency to find that a project may have a significant impact on the environment where there is substantial evidence that the project has the potential to cause substantial adverse impacts on human beings, either directly or indirectly (Cal. Code Regs., tit. 14, § 15065, subd. (a)(4)). Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to impacts on certain individuals. While changes to the environment that could indirectly affect human beings would be represented by all the designated CEQA issue areas, those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, hydrology and water

quality, noise, population and housing, public services, transportation/traffic, and utilities, which are addressed in chapter 4 of this Draft EA.

In addition, the cumulative effects associated with air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, population and housing, public services, transportation/traffic, and utilities are discussed in chapter 5 of the Draft EA. The comment does not describe specific pieces of information that are missing or how human health could be affected in addition to topic areas discussed above. Thus, no further response can be provided and no changes to the Draft EA are required.

CARB staff notes that the Scoping Plan does include a health analyses prepared separately from the requirements to analyze adverse impacts under CEQA as described above. That section of the Scoping Plan has been expanded with more information in the final version. Please refer to the Scoping Plan for more details.

41-2

The comment states that the project description in the Draft EA does not include adequate detail, specifically numerical targets for SB 375, to accurately determine environmental impacts of this proposed measure. The project description in the Draft EA describes the reasonably foreseeable compliance responses related to SB 375 target updates. As discussed on page 28 of the Draft EA:

"Reasonably foreseeable compliance responses related to SB 375 target updates could include changes to land use strategies, such as planning and construction of new housing, commercial and industrial development focused in urban areas, and preservation of open space. Reasonably foreseeable compliance responses to the implementation of transportation strategies associated with the SB 375 target updates could also include a variety of improvements to roadways and new infrastructure. Roadway improvements could include construction of bicycle and pedestrian lanes and facilities, high occupancy vehicle lanes, traffic calming infrastructure (e.g., roundabouts, ramp metering), and increased maintenance activities. New infrastructure associated with approved SCSs could include commuter rail lines, electric charging and hydrogen fueling infrastructure, and new manufacturing or modified facilities to accommodate increased use of ZEVs and PHEVs."

These are the types of actions expected to be carried out by Metropolitan Planning Organizations (MPOs) and others in response to new more stringent SB 375 targets. Identifying the exact level of stringency of the targets does not affect the conclusions of this programmatic level of analysis provided for all measures, as a whole, for the Scoping Plan. Though not necessary for the analysis completed in the Draft EA, the Scoping Plan, which is incorporated by reference into the Draft EA, provides a recommended numerical SB 375 target. However, the proposed SB 375 target update is undergoing its own separate more in-depth public process, including a staff report with proposed numeric targets and a more detailed SB 375 target update specific EA. Please refer to the SB 375 webpage for more information:

Responses to Comments

https://www.arb.ca.gov/cc/sb375/sb375.htm. No changes to the Draft EA are required in response to this comment.

The comment indicates that the Scoping Plan relied on information provided in Appendix C of the Scoping Plan, "Vibrant Communities and Landscapes and Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT)," and; therefore, should be included in the project description of the Draft EA. Appendix C of the Scoping Plan contains a discussion of strategies to reduce VMT, such as methods to promote transit, biking, walking, ride sharing, and infill development (first paragraph, page 1, Appendix C of the Scoping Plan). The Scoping Plan, as a long-term statewide planning document, broadly discusses climate policy efforts underway or being contemplated, as well as strategic options and complementary and supporting measures that support the measures proposed to achieve the 2030 target. As described in chapter 2.0, section A. of the Draft EA, the "project" for purposes of the CEQA analysis, are the measures recommended in chapter II of the Scoping Plan to achieve the 2030 target. Accordingly, Appendix C is not a part of the "project" and not analyzed in any detail in the Draft EA. Nonetheless, it should be noted that the types of impacts associated with the VMT strategies discussed in Appendix C are generally consistent with the reasonably foreseeable compliance responses and impacts discussed for SB 375 throughout the Draft EA. No changes to the Draft EA are required in response to this comment.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter 52	Afshari, Shari
3/30/2017	County of Los Angeles, Department of Public Works

The comment recommends adding actual total energy use and GHG production values for the water sector, similar to what has been provided for other sectors in Figure 1-3 of the Scoping Plan.

The Scoping Plan acknowledges the principal source of GHG emissions from the water sector comes from the fossil fuel-based energy used to produce water and the fossil fuel-based energy consumed for water end uses. The Scoping Plan states that it is estimated that around 12 percent of the total energy used in the State is related to water, with about 10 percent for end-customer uses (heating, cooling, pressurizing, and industrial processes) and about 2 percent for conveyance, treatment, and distribution (see California Department of Water Resources Water-Energy Nexus information on their website at: www.water.ca.gov/climatechange/WaterEnergyStatewide.cfm). This comment does not address the adequacy, accuracy, or completeness of the Draft EA and no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter 53	Gibson, Jamesine Rogers
12/16/2016	Union of Concerned Scientists

The comment states that promotion of autonomous vehicles (AVs) should also include a commitment to actions preventing potential future emissions increases as a result of autonomous vehicle deployment. Please see response to comment 9-1 regarding future speculation.

This comment does not address the adequacy, accuracy, or completeness of the Draft EA and no changes to the Draft EA are required in response to this comment. Nonetheless, the commenter's point is well taken and language has been added to the Scoping Plan to clarify that promotion and use of automated transportation systems should also minimize increases in VMT, fossil fuel use, and emissions.

Comment Letter	DiPerna, Rob
57	EPIC
3/17/2017	

This comment letter is addressed to the Forest Climate Action Team and states it is regarding the Draft California Forest Carbon Plan. Comments within the letter that relate to the Draft EA prepared by CARB for the Scoping Plan are extracted for responses below even though the comment letter was not directed at CARB's CEQA analysis prepared for the Scoping Plan.

57-1

This comment states the Draft Forest Carbon Plan is not accompanied by a required analysis under CEQA. CARB is not the lead agency for the Forest Carbon Plan and is not responsible for making determinations regarding the applicability of CEQA to the Forest Carbon Plan. This concern should be directed to the appropriate lead agency for the Forest Carbon Plan as this is beyond the legal authority and jurisdiction of CARB in its role in preparing the Scoping Plan. No changes to the Draft EA are required in response to this comment.

57-2

The comment states that the Forest Carbon Plan must be evaluated under CEQA. See response to comment 57-1. The comment further states that to the degree the Forest Carbon Plan is intended to be a component of the Scoping Plan, then it should be evaluated in the Draft EA prepared for the Scoping Plan. As explained in chapter 2.0, section A. of the Draft EA, although the Scoping Plan broadly discusses climate policy efforts underway or being contemplated across state government, the Draft EA is focused on those core measures recommended in the proposed scenario in chapter II of the Scoping Plan to achieve the 2030 target. As explained further in the Draft EA, those measures in chapter II are the "project" for purposes of CEQA. The Forest Carbon Plan, as an element of Natural and Working Lands sector, is discussed in chapter IV of the Scoping Plan, along with other broad strategic options and complementary and supporting measures being contemplated or undertaken within the State to support the state's long-term GHG reduction goals and support the specific measures recommended in chapter II of the Scoping Plan. Therefore, it is not evaluated in the Draft EA prepared by CARB for the Scoping Plan. Development of a Forest Carbon Plan, as a recommendation in the 2014 Scoping Plan Update, was discussed at a programmatic level in the EA certified for that update. Please refer to that EA, included as Appendix F to the 2014 Scoping Plan available on CARB's webpage at: https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. No changes to the Draft EA are required in response to this comment.

Comment Letter	DiPerna, Rob
58	EPIC
4/7/2017	

The comment makes a general statement questioning the relationship between the Forest Carbon Plan and the Scoping Plan and its Draft EA. Please see responses to comment letter 57. No changes to the Draft EA are required in response to this comment.

58-2

The comment states that to the extent that the Scoping Plan relies on carbon sequestration from California forests, it must be analyzed in the Draft EA prepared for the Scoping Plan. Please see responses to comment letter 57. No changes to the Draft EA are required in response to this comment.

58-3

The comment generally states the Cap-and-Trade program presents environmental injustices. Without any further detailed comments regarding specific impacts, no further response can be provided.

The comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA therefore, no changes to the Draft EA are required in response to this comment.

Comment Letter	Ikhrata, Hasan
60	SCAG
4/6/2017	

The comment pertains to a statement in the waste management section of chapter IV of the Scoping Plan that the production and use of bioenergy in the form of biofuels and renewable natural gas (RNG) has the potential to reduce dependency on fossil fuels. The comment states that production of biofuels that result in land use change can potentially cause more emissions than using fossil fuels alone. The commenter asks if organic waste diversion and fuel conversion would entail diverting material to a nearby facility or the breakdown occur on-site within the landfill.

The Scoping Plan discusses production and use of biofuels and RNG as options to support landfill organic waste diversion requirements by viewing the waste as a resource for bioenergy, in addition to other options such as composting. The types of facilities that could be developed and the impacts on air quality from bioenergy and composting are addressed in the Draft EA starting on p.55, and more specifically starting on p.61 under the SLCP Measures:

"Reasonably foreseeable compliance responses that could result from implementation of the methane reduction measures under the SLCP Strategy could include: operation of new modified digesters, either on-site or centralizes for dairies, landfills and wastewater treatment plants to convert manure, organic wastes, and solid wastes to biogas (which may include electricity generator sets, biogas storage tanks and compression and cleaning equipment, above ground pipeline systems, transmission poles and wires, and vehicle fueling stations;...

Because the implementation details of many of the methane measures identified in the SLCP Strategy depend substantially on the design of future inventive and regulatory programs, and upon local permitting decisions, long-term air quality impacts at this point are difficult to characterize with certainty...there are methods available to implement the identified measures that may have beneficial impacts on long-term air quality through the replacement of more-polluting emissions sources and fuels. Indeed, as a statutory matter, per SB 605, SB 1383, and AB 32, along with existing Health and Safety Code mandates for criteria pollutant planning, CARB will ultimately need to develop approaches to addressing these issues that ensure that air quality goals are achieved."

The comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA therefore, no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Shuman, Todd
68	WUMU
4/7/2017	

The comment states that the CEQA analysis failed to explore a Cap-and-Tax system. The comment is incorrect. Alternative 5, presented on page 184 – 185 of the Draft EA, discusses a Cap-and-Tax system. Please refer to the Draft EA chapter 7 for more details regarding the requirements for a CEQA analysis under CARB certified regulatory program and the specifics analysis for each of the five alternatives analyzed.

The comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA; therefore, no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Bayless, Samuel
69	CIÓMA
4/3/2017	

The comment quotes a section of the Draft EA under the resource area "Population, Employment, and Housing" and states that this text contradicts statements in the Executive Summary of the Scoping Plan. The commenter correctly states that the Executive Summary of the Scoping Plan discusses opportunities for businesses and investors. This does not contradict statements in the Draft EA, which are focused on whether the project would induce substantial population growth, displace substantial numbers of existing housing, or displace substantial numbers of people necessitating construction elsewhere. (See the CEQA Guidelines, Appendix G, Environmental Checklist Form, section XIII.) The economic opportunities discussed in the Executive Summary would be due to a shift in the California economy away from dependence on fossil fuels to more sustainable energy supplies. This is stated clearly in the Draft EA in the second paragraph of Impact 14.b, as follows:

"Overall, the Proposed [Scoping] Plan would decrease reliance on fossil fuels, while increasing renewable energy supplies, reducing the carbon intensity of fuels, and reducing GHG emissions from various sources (e.g., dairies, fireplaces, transportation, and refineries). As described in Appendix E of the Proposed [Scoping] Plan, while some sectors of the economy could see job growth, particularly in the clean energy sector because of implementation of measures in the Proposed [Scoping] Plan, this would not result in substantial increases in employment opportunities or otherwise induce substantial population growth in the State."

The EA section is focused on the impact expected economic growth within the State and whether it would induce substantial population growth, displace substantial numbers of existing housing, or displace substantial numbers of people necessitating construction elsewhere.

In the Scoping Plan, the economic effects of the plan are summarized as follows:

"The Scoping Plan outlines a path to achieve the SB 32 target that requires less reliance on fossil fuels and increased investment in low carbon fuels and clean energy technologies. Through this shift, California can lead the world in developing the technologies needed to reduce the global risks of climate change. This builds on California's current successes of reducing GHG emissions while also developing a cleaner, resilient economy that uses less energy and generates less pollution. Innovation in low-carbon technologies will continue to open growth opportunities for investors and businesses in California. As modeled, the analysis in this Scoping Plan suggests that the costs of transitioning to this lower carbon economy are small, even without counting the potential opportunities for new industries and innovation in California. Under the

Responses to Comments

Scoping Plan, the California economy, employment, and personal income will continue to grow as California businesses and consumers make clean energy investments and improve efficiency and productivity to reduce energy costs. In 2030, the California economy is projected to grow to \$3.4 trillion, an average growth rate of 2.2 percent per year from 2021 to 2030."

Because the economic growth is due to shifts in the economy and would not induce substantial population growth, the Draft EA correctly characterizes the effects of the Scoping Plan on population and housing for purposes of CEQA. Additional information is available in Appendix E, Economic Analysis, of the Scoping Plan.

The comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA therefore, no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Mork, Eric
84	EBR Development, LLC
4/10/2017	·

The comment states incorrectly that the Fifth Circuit Court of Appeals ruled in March 2017 that CARB must find avenues to reduce NOx. The commenter's premise regarding a March 2017 ruling from the Fifth Circuit Court of Appeals likely refers to proceedings in California's Fifth District Court of Appeal regarding a 2009 CEQA challenge to CARB's Low Carbon Fuel Standard (LCFS) regulation. That Court did initially issue an order on April 10, 2017 (subsequently vacated and reissued with modifications on May 30, 2017) directing CARB to conduct further analysis regarding potential NOx emissions impacts related to increased use of biodiesel within the state of California that may have been caused by the LCFS. That court has not ordered CARB to find additional avenues to reduce NOx.

The commenter states that ethanol could be a NOx-reduction solution. The commenter cites an article from *Ethanol Across America* that indicates aromatics are three times more reactive to form ozone, which could be reduced through higher ethanol blends beyond the 10 percent in today's gasoline. In addition, the comment cites a decrease in Step Reid Vapor Pressure from increased ethanol concentration as a benefit, along with the NOx emission reductions. This comment raises an issue that is outside the framework of the Scoping Plan and the Draft EA. Nevertheless, the Draft EA does acknowledge use of ethanol as part of the LCFS Measure (p.53). In addition, the impact determination section provides examples to support the statement that the increased proposed LCFS measure, along with other local, State, and federal policies to support alternative fuel adoption, would be anticipated to result in reductions for several criteria air pollutants and toxic air contaminants (TACs) (see discussion starting on p.65).

The comment is noted, but with no further detailed comments regarding specific impacts or regarding the adequacy, accuracy, or completeness of the Draft EA prepared for the Scoping Plan, no further response and no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	McGaraghan
85	Energy Solutions
4/6/2016	

The comment recommends adding fuel-efficient passenger vehicle replacement tires to the list of transportation measures and to the Draft EA. This comment is a suggestion for an additional measure to be added to Scoping Plan and does not specifically address significant adverse environmental impacts or the adequacy of the Draft EA. The recommendation is noted and will be provided to Board members for their consideration. No further response to this comment is required and no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA, so no further response to this letter is required.

Comment Letter	Scow, Adam
89	Food & Water Watch
4/10/2017	

The comment states that Cap-and-Trade should not be relied upon to achieve emissions reductions, and recommends command-and-control regulation be the recommended action. This comment is a recommendation for a different alternative than the scenario proposed in the Scoping Plan and does not raise any specific issues related to the alternatives analysis in the Draft EA. The Draft EA did include a discussion of alternatives as required by CARB's certified regulatory program, including a no Cap-and-Trade alternative. That CEQA discussion regarding Alternative 2 on pages 180-181 of the Draft EA states:

"It is unclear if Alternative 2 would meet 2030 GHG emission reduction targets (Objectives 1 and 2). To achieve the 2030 GHG emissions reduction target without the Cap-and-Trade Program, significant additional actions beyond the known commitments would have to be put in place, many of which may currently face implementation, technology, and cost barriers that must be overcome to ensure the target can be achieved. If any measures are unable to be implemented or fail to perform, as needed, new measures would need to be identified, designed, and implemented. The time required to design and implement new measures could impede the State's ability to achieve its 2030 GHG target. Under Alternative 2, the Scoping Plan would exceed objectives related to 50 percent renewable and the doubling of energy efficiency at existing buildings (Objective 3). This alternative would increase energy efficiency in existing buildings and make heating fuels cleaner, and reduce the release of methane, black carbon, and other short-lived climate pollutants; however, it is unknown if measures would be stringent enough to meet the goals associated with Objectives 4 and 5. This Alternative would generally meet the remainder of the project objectives, as it would pursue emission reductions that are real, permanent, quantifiable, verifiable and enforceable (Objectives 6), and is consistent with other requirements set forth under the California Health and Safety Code (Objectives 7 and 9 through 15). To be consistent with AB 32, this alternative would minimize, to the extent feasible, leakage of emissions outside of the State (Objective 8)."

The comment related to the content of the Scoping Plan is noted and will be provided to Board members for their consideration. Absent any specific comments related to specifics of the Draft EA, no further response can be provided to this comment.

89-2

The commenter expresses concern about the impact of the Cap-and-Trade Regulation in environmental justice communities and asserts the many industrial facilities covered by the Cap-and-Trade program have had increases in local GHG emissions. The

commenter cites a 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) and states a conclusion from the report that industrial facilities are more often located in low-income communities and communities of color, and that many of these industrial polluters have increased localized GHG emissions since cap-and-trade was implemented. Please refer to Master Response No. 1.

89-3

The comment states that offsets, which are part of the Cap-and-Trade measure in the preferred scenario for the Scoping Plan, are a threat to achieving real, additional, or permanent emissions reductions. CARB staff strongly disagrees with commenter's assertion. As required by AB 32, all offsets utilized as part of the Cap-and-Trade Program must be real, additional, permanent, verifiable, quantifiable, and enforceable. CARB has developed rigorous offset quantification methods that incorporate the AB 32 criteria and ensure any offset issued and used in the Program meets these criteria. Specifically, the Compliance Offset Protocols, in conjunction with all of the strict and thorough requirements in the Cap-and-Trade Regulation regarding offsets, meet the requirements of AB 32. The Compliance Offset Protocols adopted under the Cap-and-Trade Regulation have been established with multiple levels of review, use conservative methods to account for uncertainty and emissions leakage, and to establish the additionality of offset projects in setting project baselines. In addition, processes are taken to ensure that the greenhouse gas reductions and greenhouse gas removal enhancements being credited as offsets are real, additional, quantifiable, permanent, verifiable, and enforceable. Importantly, CARB's method of implementing the statute with respect to offsets was upheld by the First District Court of Appeals in *Our Children's* Earth Foundation v. ARB (2015) 234 Cal. App. 4th 870. This comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA, and no further response is required.

89-4

The comment states that use of renewable natural gas (RNG) will perpetuate significant health risks to Californians and the environment, because RNG releases carbon dioxide (CO₂) when combusted or flared and methane from any source is not neutral or clean.

Please see response to Comment 60-1 regarding RNG and potential compliance responses and air quality impacts. This comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA, and no further response is required.

89-5

The comment states that methane digesters do little to mitigate the water pollution caused by animal waste from industrial dairies. After detailing some of those existing impacts, the comment recommends CARB regulate existing factory farms while incentivizing conversion to pasture based production. The SLCP Strategy is identified

as one of the "known commitments" in the proposed scenario, and that strategy includes methane measures for existing dairies. (See the Draft EA, chapter 2, section 1. (d). The Draft EA for the Scoping Plan does discuss these dairy measures at a programmatic level, including the potential for impacts to ground water. (See page 109 of the Draft EA). The SLCP Strategy has more specific details regarding potential dairy measures and is supportive of converting flush-water lagoon manure management systems to solid manure management systems, including pasture-based management. A more specific EA for the SLCP Strategy was certified by the Board when the SLCP was approved in March 2017. Please refer to the webpage for the SLCP on CARB's website at: https://www.arb.ca.gov/cc/shortlived/shortlived.htm. Absent any specific comments related to specifics of the analysis in the Draft EA, no further response can be provided to this comment.

89-6

The comment makes recommendations related to carbon sequestration in natural environments and working lands. Carbon sequestration of natural environments and working lands is not used to calculate GHG reduction targets and is not subject to analysis in the Draft EA. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA, no further response is required, and no changes to the Draft EA are required.

Comment Letter	Schonbrunn, David
93	Transportation Solutions Defense and Education Fund
4/10/2017	·

The comment refers to two sentences from the Draft EA Introduction and Background section and alleges these extracts demonstrate the Proposed Plan is inadequate because neither the Draft EA nor the Scoping Plan included a quantified demonstration that the reduction measures will achieve the 2030 target.

This comment does not address the adequacy of the Draft EA prepared for the Scoping Plan, but instead points to the Draft EA to make a comment about the alleged inadequacy of the Scoping Plan itself. Because this comment does not raise a significant environmental issue regarding adverse impacts of the proposed project or the adequacy of the Draft EA analysis of those impacts, no further response is required. Nonetheless, CARB staff notes that the Scoping Plan does include details about the development of the proposed scenario to achieve the 2030 target. Please refer to chapter II of the Scoping Plan, which discusses the proposed scenario and details about the modeling conducted for both the Reference Scenario (BAU) and the proposed scenario. Please refer to the figures and tables within chapter II for the quantification of the proposed scenario measures, including Figure II-2, which provides a table with the quantified reductions for each of the measures included in the proposed scenario. As explained in chapter II, more details about the modeling for the Reference Scenario and Proposed Scenario, including details about the Pathways modeling to achieve the 2030 target, can be found in Appendices D and E to the Proposed Plan.

93-2

This comment states that the absence of a demonstration that the Scoping Plan would achieve the targets in AB 32 and SB 32 is a violation of those statutes and that "separate CEQA thresholds of significance should be set for failure to achieve the GHG targets mandated by AB 32 and SB 32." Please see response to comment 93-1 for CARB's response regarding how the Scoping Plan demonstrates achieving the 2030 target. With regard to the suggestion to develop "separate CEQA thresholds of significance," CARB staff does not understand this comment. Under CEQA, lead agencies are encouraged to develop thresholds that the agency uses to determine the significance of an environmental effect within a CEQA document. (CCR, tit. 14, §15064.7.) SB 32 and AB 32 are separate statutes with separate purposes from CEQA. It is not clear to CARB staff what the comment suggests be done by CARB with regard to this comment, and it does not appear to be a comment on the adequacy of the Draft EA, so no further response can be provided.

93-3

The comment states that the Scoping Plan and the Draft EA do not reference Transdef's legal challenge to the 2014 Scoping Plan Update regarding its inclusion of

High Speed Rail (HSR), and states the Scoping Plan makes no showing that the HSR will achieve the "maximum technologically feasible and cost-effective GHG emission reductions by 2020." (Health & Saf. Code, § 38561, subd. (a).)

There is no requirement under CARB's certified regulatory program or CEQA for the Draft EA prepared for the Scoping Plan to reference any ongoing or prior legal challenges related to the proposed project. No changes to the Draft EA are required in response to this comment. Nonetheless, CARB notes that Transdef's legal challenge against the 2014 Scoping Plan Update was fully litigated and the Sacramento County Superior Court issued a final decision on May 15, 2017 denying Transdef's challenge in its entirety. The final decision denied Transdef's claim that the 2014 Update improperly included the HSR based on Health and Safety Code section 38561 as repeated in this comment and also Transdef's claims regarding the adequacy of the EA prepared for the 2014 Scoping Plan Update. (Transportation Solutions Defense and Education Fund v. California Air Resources Board, Sacramento County Superior Court, Case No. 34-2014-8000-1974-CU-WM-GDS.) In terms of the current Scoping Plan, CARB staff further notes that the HSR is part of the "reference scenario," or in other words, it was modeled as part of the BAU and is not a new measure proposed in this current plan to achieve the 2030 target. The current Draft EA is focused on analyzing the proposed project. which is those measures proposed in chapter II of the Scoping Plan to achieve the 2030 target. HSR is not a measure proposed in chapter II. The 2014 Scoping Plan has a final certified environmental document that covered the inclusion of the HSR, and that document remains valid after Transdef's legal challenge to it. Because HSR is part of the reference scenario and not a new proposed measure, there is no requirement to revisit that measure, or any of the other measures included in the previous plans. because CEQA limits the circumstances of subsequent review because of the interest in finality and efficiency in the environmental review process. (See Pub. Resources Code §21166 and Cal. Code Regs., tit. 14, §15162; Friends of the Coll. of San Mateo Gardens v. San Mateo Cty. Cmty. Coll. Dist. (2016) 1 Cal.5th 937, 949.) The purpose of the current Draft EA is to explore changes to the project (e.g. new measures proposed to achieve the 2030 target discussed in chapter II of the Scoping Plan) and impacts not considered in the previous certified environmental documents. "The event of a change in a project is not an occasion to revisit environmental concerns laid to rest in the original analysis. Only changed circumstances ... are at issue." (Id. at p. 949 quoting Save Our Neighborhood v. Lishman (2006) 140 Cal. App. 4th 1288.) No changes to the Draft EA are required in response to this comment.

93-4 through 93-8 General Response

These five comments reference sections of the Draft EA, but make suggestions regarding the contents of the Scoping Plan and no comments regarding the Draft EA. It is not clear why the commenter did not reference the Scoping Plan directly because the commenter is not commenting on the adequacy, accuracy, or completeness of the Draft EA. For example, comment 93-4 states that there needs to be an overall top-down emissions reduction expectation for SB 375 regional target that are quantified in the Scoping Plan. This is not a comment on the impacts analysis prepared for the Scoping Plan or the adequacy of the Draft EA and no further response is required under CARB's

certified regulatory program or CEQA. Please refer to the Introduction to this RTC for an explanation about the requirement to respond to comments and what type of comment require substantive responses. Although no further response or changes to the Draft EA are required in response to these suggestions for changes to the Scoping Plan, these suggestions are noted and being provided to Board members for their consideration, and CARB staff is providing a short response to each suggestion below.

93-4

The comment states that there needs to be an overall top-down emissions reduction expectation for SB 375 regional targets that are quantified in the Scoping Plan. The proposed SB 375 target update is undergoing its own separate more in-depth public process, including a staff report with the proposed numeric targets and a more detailed SB 375 target update specific EA. Please refer to the SB 375 webpage for more information: https://www.arb.ca.gov/cc/sb375/sb375.htm. Additional information regarding the updated targets, including a recommended numerical SB 375 target, has been added to the final Scoping Plan since the January release, including the GHG reductions expected from this measure. Please refer to chapter II of the final Scoping Plan for more details.

93-5

The comment expresses concerns related to the transit industry's ability to reduce GHG emissions through CARB's focus on the motive power of transit vehicles. Innovative Clean Transit is included as an action in CARB's *Revised Proposed 2016 State Strategy for the SIP*, which is considered a "known commitment" in the proposed scenario. The *Revised Proposed 2016 State Strategy for the SIP* (SIP Strategy) underwent a separate more in-depth public process, including a staff report and a more detailed EA. Please refer to the SIP Strategy webpage for more details regarding that plan and its measures: https://www.arb.ca.gov/planning/sip/2016sip/2016sip.htm. The SIP Strategy is also described at a higher programmatic level in the Draft EA prepared for the Scoping Plan on page 16 through 23, and is also included in the impacts analysis and mitigation measures throughout each resource are in the Draft EA.

93-6

The comment states there is no longer any justification for the U.S. Environmental Protection Agency (U.S. EPA) to allow full locomotive remanufacturing to Tier 0 standards because some technicality has been met, such as the preservation of the chassis of an outdated locomotive. This is a comment on another element of the SIP Strategy included as a "known commitment" in the proposed scenario in the Scoping Plan. Please refer to the response to comment 93-5 for more information on the SIP Strategy and its analysis in the current Draft EA.

Responses to Comments

93-7

The comment states that CARB should support a different metric for transit oriented development than the one that is currently legislatively mandated. The metric mentioned in the Draft EA is a descriptor of transit oriented development, which is a potential land use strategy that could support the SB 375 objective of reducing greenhouse gas emissions.

93-8

The commenter disagrees that Cap-and-Trade provides certainty and states that if the Cap-and-Trade system is itself flawed, or if it is gamed, it will not achieve its goal. The commenter refers to uncertainty that results from exogenous factors, which could impact all scenarios evaluated. The commenter also conflates disappointing Cap-and-Trade auction results with environmental certainty. The cap determines environmental certainty, whereas auction results relate to proceeds raised.

93-9

The comment states that the Draft EA "lacks a chart listing the VMT projections of all of its various county and regional jurisdictions, along with a statewide aggregation, and comparing that to the Vision Scenario plans in the Mobile Source Strategy." It also states the VMT reduction strategies that are discussed in Appendix C of the Scoping Plan, "Vibrant Communities and Landscapes and Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce VMT" are not included in the Project Description section of the Draft EA and cannot be considered "environmentally cleared" or part of the Scoping Plan.

First, there is no requirement under CARB's certified regulatory program or CEQA for the Draft EA to include a chart listing the VMT projections for county and regional jurisdictions within the State, a statewide aggregation, or a comparison of those to the Mobile Source Strategy. This appears to be a suggestion for additional details in the Scoping Plan for measures to achieve the VMT reduction included in the proposed scenario. This suggestion for the Scoping Plan is noted and is being provided to Board members for their consideration. Without additional information about how this relates to the adequacy of the Draft EA no further response can be provided. Please also refer to response to comment 93-4 above.

With regard to the comment regarding Appendix C of the Scoping Plan: Appendix C of the Scoping Plan contains a discussion of strategies to reduce VMT, such as methods to promote transit, biking, walking, ride sharing, and infill development (first paragraph, page 1, Appendix C of the Scoping Plan). The Scoping Plan, as a long-term statewide planning document, broadly discusses climate policy efforts underway or being contemplated, as well as strategic options and complementary and supporting measures that support the measures proposed to achieve the 2030 target. As described in chapter 2.0, section A. of the Draft EA, the "project" for purposes of the CEQA analysis, are the measures recommended in chapter II of the Scoping Plan to achieve

the 2030 target. Accordingly, Appendix C is not a part of the "project" and not analyzed in any detail in the Draft EA. Appendix C of the Scoping Plan is intended to spur discussion rather than to commit to any specific action as indicated by the title of the document "Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce VMT -- for Discussion" (emphasis added) and by the description on page 1 of Appendix C. It further states "Below is a list of potential additional strategies that the State could pursue to help achieve further VMT reduction, support local and regional actions already underway, and advance multiple additional goals. Each of these strategies would require further study, evaluation, and public comment. They are presented here for the purpose of soliciting public discussion and input." CARB also notes that these strategies are generally consistent with the reasonably foreseeable compliance responses related to SB 375 target updates. As discussed on page 28 of the Draft EA:

"Reasonably foreseeable compliance responses related to SB 375 target updates could include changes to land use strategies, such as planning and construction of new housing, commercial and industrial development focused in urban areas, and preservation of open space. Reasonably foreseeable compliance responses to the implementation of transportation strategies associated with the SB 375 target updates could also include a variety of improvements to roadways and new infrastructure. Roadway improvements could include construction of bicycle and pedestrian lanes and facilities, high occupancy vehicle lanes, traffic calming infrastructure (e.g., roundabouts, ramp metering), and increased maintenance activities. New infrastructure associated with approved Sustainable Community Strategies (SCSs) could include commuter rail lines, electric charging and hydrogen fueling infrastructure, and new manufacturing or modified facilities to accommodate increased use of ZEVs and PHEVs."

The types of impacts associated with the VMT strategies discussed in Appendix C are generally consistent with the reasonably foreseeable compliance responses and impacts discussed for SB 375 throughout the Draft EA. Please see response to comment 41-2. No changes to the Draft EA are required in response to this comment.

93-10

The comment states the Draft EA under Impact 8.a failed to identify GHG emissions resulting from the construction of the HSR. Please refer to response to comment 93-3 above. HSR was already adequately analyzed in two previous certified EAs prepared for prior Scoping Plans (2008 and 2014 Update) and no further analysis of HSR is required in this Draft EA. Furthermore, this exact issue was raised in Transdef's challenge to the 2014 Scoping Plan Update in *Transportation Solutions Defense and Education Fund v. California Air Resources Board* (Sacramento County Superior Court, Case No. 34-2014-8000-1974-CU-WM-GDS) and fully considered by the Sacramento County Superior Court. The court found no merit to this claim, finding CARB's programmatic level environmental document that examined measures at the "first tier" was not required to examine the level of detail that would be examined in project-

specific EIRs, such as those that the High Speed Rail Authority prepared for segments of construction of the HSR. (See Final Decision issued May 15, 2017 at pages 6-13.) Program EIRs for planning documents analyze environmental effects at the "first-tier" of review and need not provide detailed, project-specific analyses. (Town of Atherton v. California High Speed Rail Authority (2014) 228 Cal. App. 4th 344, 347; Rio Vista Farm Bur. Center v. County of Solano (1992) 5 Cal. App. 4th 351, 375 [programmatic review of waste disposal plan upheld]; see also, In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings (2008) 43 Cal.4th 1143, 1169 [programmatic review of CalFed plan to restore Bay-Delta].) In Town of Atherton, petitioners, including Transdef, challenged the programmatic EIR for the high speed rail segment from the Central Valley to the Bay Area alleging the impacts from the precise elevated alignment of the tracks on the Peninsula were not analyzed in sufficient detail. The Third District Court of Appeal rejected this challenge holding that the "precise vertical alignment...at specific locations is the type of site-specific consideration that must be examined in detail in a project EIR." (Town of Atherton, supra, 228 Cal.App.4th 314,346.) The Court reasoned that "because the primary decisions ripe for review in the first-tier program EIR were the general alignment and choice of routes...and did not include the specific vertical alignment at a certain portion of the...route." (Ibid.) "Requiring a first-tier program EIR to provide greater detail as revealed by project-level analyses 'undermines the purpose of tiering and burdens the program EIR with detail that would be more feasibly given and more useful at the second tier stage." (Ibid. [quoting In re Bay-Delta, supra, 43 Cal.4th at p. 1173].) The Court concluded that the High Speed Rail Authority had "properly deferred analysis of environmental impacts and mitigation measures for the vertical alignments at certain portions of the...system's route to later project EIRs." (Id. at p. 347.) The Scoping Plan process is even one more step removed in the HSR process than the programmatic documents prepared for the HSR. The certified EAs for the 2008 and 2014 Updated Scoping Plans adequately identified impacts, mitigation, and alternatives associated with the entire group of measures in the plans, including the HSR, and appropriately deferred specific discussion of project-level impacts, mitigation measures, and alternatives to the subsequent project EIRs developed by the agency that would carry out that particular measure development. HSR is a project approved by and being implemented by the California High Speed Rail Authority, and CARB has no discretionary approval authority over that project. Requiring CARB to examine the level of detail the comment requests for HSR (and presumably also for every other measure in each scoping plan) would "undermine the purpose of tiering and burden the program EIR with detail that would be more feasibly given and more useful at the second tier stage." (In re Bay-Delta, supra, 43 Cal.4th at p. 1173.) CARB complied with its obligations in conducting a programmatic review of the HSR in the previous certified EAs as part of the programmatic Scoping Plan environmental analyses in 2008 and 2014 and no further analysis is required as part of the current Scoping Plan. No changes to the Draft EA are required in response to this comment.

93-11

The comment states that after identifying a significant impact of construction GHG emissions in section 8a. based on the comment in 93-10, the appropriate mitigation measure to reduce the impact is elimination of the HSR as a measure in the Scoping

Plan. CARB disagrees that this section of the Draft EA should find a significant GHG emissions impact and identify any mitigation measures. Please see response to comment 93-10 and 93-3 above. No changes to the Draft EA are required in response to this comment.

93-12

The comment states that the Draft EA fails to acknowledge GHG impacts from induced demand caused by strategies in Regional Transportation Plans (RTPs)/SCS developed by MPOs on page 65 of the Draft EA. The references section of the Draft EA is within the Air Quality section discussing potential operational impacts of the measures to air quality. The comment quotes a section regarding potential local impacts from increases in TACs. This section should not be revised to include any GHG impacts from SB 375 as a measure (which includes actions in RTP/SCSs as programmatic level). Section 8 of the Draft EA discusses GHG impacts of the measures both for construction and operational phases. The level of detail in that section of the Draft EA is appropriate for this level of environmental document. Please see response to comment 93-10 regarding the level of detail appropriate for a programmatic level analysis and one superior court's finding on the EA prepared for the 2014 Scoping Plan Update that included the same level of analysis as provided in this document. Furthermore, it should be noted that MPOs would only include those strategies in an SCS that lead to VMT reductions because that is the entire purpose of an SCS (e.g. to demonstrate GHG reductions sufficient to achieve the MPO target set by CARB). Thus, if an MPO action led to GHG increases (e.g., road widening, which the commenter suggests leads to GHG increases) then that action would not be a strategy in an SCS included to achieve the MPO's SB 375 target and; thus, any increases in GHGs would not be a result of SB 375.

The rest of this comment states the Draft EA failed to include an analysis of GHG impacts from certain proposals in Appendix C of the Scoping Plan. Please see response to comment 93-9 for more information regarding Appendix C.

93-13

The comment states that AVs may not provide emission benefits. See response to comment 53-1.

93-14

The comment states that AVs cannot provide VMT reductions. See response to comment 53-1.

93-15

The comment states that mitigation measures listed for traffic can be implemented by CARB. The mitigation measures referred to in this comment addresses traffic impacts related to construction-related activities. Mitigation measures to reduce construction related traffic impacts are included in the Draft EA, and listed as follows (page 145-146):

- Minimize the number and length of access, internal, service, and maintenance roads and use existing roads when feasible.
- Provide for safe ingress and egress to/from the proposed project site.
- Identify road design requirements for any proposed roads, and related road improvements.
- If new roads are necessary, prepare a road siting plan and consult standards contained in federal, State, or local requirements. The plans should include design and construction protocols to meet the appropriate roadway standards and be no larger than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Access roads should be located to avoid or minimize impacts to washes and stream crossings, follow natural contours and minimize side-hill cuts. Roads internal to a project site should be designed to minimize ground disturbance. Excessive grades on roads, road embankments, ditches, and drainages should be avoided, especially in areas with erodible soils.
- Prepare a Construction Traffic Control Plan and a Traffic Management Plan.

The Draft EA is a programmatic level document providing a broad analysis of what is reasonably foreseeable with implementation of all the measures in the Scoping Plan. Please refer to response to comment 93-10 for information about level of detail appropriate for a programmatic level document. CARB is not approving or carrying out the particular project level activities that could lead to these types of traffic impacts. CARB cannot require mitigation to be implemented nor can CARB enforce these measures because CARB is not a lead agency over these types of projects and has no legal authority over state or local agencies that would carry out these types of projects. The comment states CARB has authority to mitigate these traffic impacts by limiting eligibility for grants of Greenhouse Gas Reduction Fund (GGRF) funds "to only those jurisdictions that fully mitigate their climate impacts." First, the section of the Draft EA which the comment addresses is about traffic impacts, not climate impacts, so the suggestion to limit funds to projects that fully mitigate climate impacts would not address traffic impacts as those are two different types of impacts addressed in EIRs and cannot be presumed to always be directly correlated. Secondly, the Legislature appropriates GGRF funds to jurisdictions, and CARB does not have authority to restrict how the Legislature appropriates money. As to any other grant programs that CARB administers, if a particular grant action is subject to CEQA, then CARB would carry out the appropriate level of environmental review as required by CEQA, and if traffic or GHG impacts are identified, require the enforceable mitigation as required for that particular project. No changes to the Draft EA are required in response to this comment.

93-16

The comment states "ARB has the authority to enact Indirect Source Mitigation Fees" for "VMT-increasing impacts of greenfield development, which lead to increased GHG emissions and regional traffic congestion." It is not clear to CARB staff what statute

Transdef believes authorizes CARB to require an "Indirect Source Mitigation Fee" for land-use development as no statutory authority is cited in the comment. CARB does not authorize, entitle, or otherwise approve land-use developments, so it is unclear how CARB would require mitigation under CEQA for projects for which it is neither a lead agency nor responsible agency. This is typically within the purview of local counties and cities with authority over land-use planning and entitlements. No changes to the Draft EA are required in response to this comment.

93-17

The comment states that the Mandatory Findings of Significance are not adequate because the text refers to other chapters in the Draft EA. The Mandatory Findings of Significance are presented as three topics: impacts on species and historic resources; impacts that may be cumulatively significant; and, environmental effects that could cause substantial adverse effects on human beings. As noted in chapter 6, chapter 4 of the Draft EA addresses impacts that could occur to biological resources, including the reduction of fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species; and impacts that could occur related to California history and prehistory, historic resources, archaeological resources, and paleontological resources (page 170 of the Draft EA). Cumulative impacts are addressed for each of the environmental topics listed above and are provided in chapter 5, "Cumulative and Growth-Inducing Impacts," in the Draft EA (page 170 of the Draft EA). And, changes to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to impacts on certain individuals. While changes to the environment that could indirectly affect human beings would be represented by all the designated CEQA issue areas, those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, population and housing, public services, transportation/traffic, and utilities, which are addressed in chapter 4 of the Draft EA (page 171 of the Draft EA). Thus, all topics required under the Mandatory Findings of Significance are described in the Draft EA and are referenced in chapter 6 of the Draft EA. No changes to the Draft EA are required in response to this comment.

93-18

The comment states that the Table of Contents should be more detailed. CEQA Guidelines Section 15122 states that "An EIR shall contain at least a table of contents or an index to assist readers in findings the analysis of different subjects and issues." The table of contents in the Draft EA lists the chapter title and secondary heading. It provides clear direction on where several important topics are located, including: the project description, impact analysis and mitigation measures, cumulative and growth-inducing impacts, mandatory findings of significance, and alternatives. Furthermore, the document was made available online in a searchable PDF, which allows readers to easily locate specific topics. Indeed, searching through a PDF would allow for easier

Responses to Comments

access to specific terms and topics than even a very lengthy table of contents. No changes to the Draft EA are required in response to this comment.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Parfrey, Jonathan
101	Alliance of Regional Collaboratives for Climate Action
4/10/2017	

The comment recommends conducting a health impact assessment of the full range of emission reduction strategies in the Scoping Plan. Please see response to comment 41-1.

Comment Letter	Clark, Margaret
104	LA County Solid Waste Management Committee
4/10/2017	

The comment recommends that the Scoping Plan or Draft EA quantify and compare the emissions, health, and economic impacts of different end uses of organic waste, including biofuels, electricity, pipeline biogas, and compost. The Draft EA analyzes elements in the Scoping Plan and contains a list of reasonably foreseeable compliance responses for the recommended measures. These reasonably foreseeable compliance responses are compared to existing conditions, which meets CEQA requirements. Without more detail related to how different end uses of organic waste, including biofuels, electricity, pipeline biogas, and compost should be evaluated, no further response can be provided and no changes to the document are necessary.

104-2

The comment states that the Final EA should compare the environmental impacts of the use of low carbon fuels as part of the LCFS with the use of zero emission vehicles as part of the Mobile Sources Strategy and Sustainable Freight Strategy. Consistent with CEQA, the Draft EA addresses the environmental impacts resulting from implementing the Scoping Plan compared to a baseline consisting of existing conditions. There are no requirements to compare and contrast the measures included in the Scoping Plan. No changes to the document are necessary.

104-3

The comment states that the Final EA should include a description of the benefits of using low- NOx engines for vehicles such as on-road heavy-duty vehicles. This comment pertains to the contents of the Scoping Plan and does not address the adequacy, accuracy, or completeness of the Draft EA. This recommendation is noted and will be provided to the Board members for their consideration. No changes to the Draft EA are necessary in response to this comment.

104-4

The comment states that the Draft EA should include thermal conversion technologies under methane reduction measures in the SLCP Strategy. This comment provides a recommendation for the contents of a particular measure within the Scoping Plan and does not address the adequacy, accuracy, or completeness of the Draft EA. The SLCP Strategy, included as a "known commitment" in the Scoping Plan, was approved by the Board in March 2017. The SLCP had its own more detailed environmental document. Please refer to this page for more information on that document and its findings: https://www.arb.ca.gov/cc/shortlived/shortlived.htm.

This recommendation is noted and will be provided to Board members for their consideration. No changes to the Draft EA are necessary in response to this comment.

Responses to Comments

104-5

The comment states that the Final EA should include a statement that the use of renewable natural gas (RNG) produced from solid waste would result in greater GHG reductions and produce less waste from existing fleets being replaced by zero emission vehicles (ZEVs). Consistent with CEQA, the EA programmatically addresses the potential for adverse environmental impacts resulting from implementing the Scoping Plan compared to a baseline consisting of existing conditions. There are no requirements to compare and contrast the measures included in the Scoping Plan or discuss ways to result in greater GHG reductions. No changes to the Draft EA are necessary in response to this comment.

104-6

The comment states that the Final EA should include thermal conversion technologies under methane reduction measures in the SLCP Strategy. See response to comment 104-4.

104-7

The comment states that the Final EA should analyze the impacts of increasing organics markets throughout the State. The comment references the goal on page 120 of the Scoping Plan released in January 2017. The Scoping Plan, as a long-term statewide planning document, broadly discusses climate policy efforts underway or being contemplated, as well as strategic options and complementary and supporting measures that support the measures proposed to achieve the 2030 target. As described in chapter 2.0, section A. of the Draft EA, the "project" for purposes of the CEQA analysis, are the measures recommended in chapter II of the Scoping Plan to achieve the 2030 target. Not all efforts or goals identified in the Scoping Plan, including the goal referenced by the commenter on page 120, are part of the "project" for purposes of CEQA. Therefore, issues pertaining to the goal of increasing organic markets is not included in the Draft EA. No changes to the Draft EA are necessary in response to this comment.

Comment Letter	Reheis-Boyd, Catherine
105	Western States Petroleum Association
4/10/2017	

The comment states that the Refinery Measure increases the risk of emissions leakage compared to the All Cap-and-Trade alternative.

AB 398 specifically designates the Cap-and-Trade Program as the control measure for combustion CO₂ emissions from refineries and the oil and gas sector. As such, the refinery measure included in the January Scoping Plan document has been removed from the final Scoping Plan. The Final EA also reflects this change.

Moreover, the Draft EA, which analyzed the proposed scenario at a programmatic level, includes a discussion about leakage prevention in the Scoping Plan, which includes extension of allowance allocation beyond 2020 under the Cap-and-Trade Regulation, which is designed to protect against emissions leakage. As noted on page 2-24 of the July 27, 2017 Board approved response to comments on the Draft EA to the Cap-and-Trade rulemaking, "[s]taff remains committed to continuing to provide industrial allowance allocation post-2020 at levels sufficient to minimize emissions leakage (per the AB 32 requirement). This industrial allocation will continue to be in the form of output-based updating allocation based on emissions intensity product benchmarks where feasible and allocation based on energy benchmarks where not. Recently enacted AB 398 provides specific direction to CARB on what the post-2020 assistance factors will be."

105-2

The comment states protection of public health at the regional and local level is achieved predominantly through existing criteria and toxic regulatory mechanisms unrelated to climate programs. The comment also states that the Scoping Plan scenario will not result in better public health outcomes than the All Cap-And-Trade Alternative.

This comment does not relate directly to the Draft EA, but CARB staff notes that the All Cap-and-Trade Alternative is discussed on page 184 of the Draft EA and compared for purposes of CEQA to the Scoping Plan scenario. The comment does not otherwise address the adequacy, accuracy, or completeness of the Draft EA and no further response is required.

105-3

The comment states that CARB does not incorporate safeguards to prevent emissions leakage and economic dislocation in the event of future uncertainty.

Please see response to comment 105-1 for a discussion about safeguards to prevent emissions leakage and economic dislocation. The comment does not otherwise address

Responses to Comments

the adequacy, accuracy, or completeness of the Draft EA and no further response is required.

105-4

The comment states that the refinery measure is unlikely to reduce criteria pollutants or TACs and would not provide additional GHG reductions.

This comment does not address the adequacy, accuracy, or completeness of the Draft EA. No further response and no changes to the Draft EA are required in response to this comment. Moreover, since AB 398 designates the Cap-and-Trade Program as the control measure for combustion CO₂ emissions from refineries and the oil and gas sector, the refinery measure included in the January 2017 draft Scoping Plan document has been removed from the final Scoping Plan. Nonetheless, CARB staff notes that analysis of the air quality impacts of the refinery measure were included in the Draft EA on page 67.

See also response to comment 105-1.

105-5

The comment cites a 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) and suggestions from the report that the Cap-and-Trade program has resulted in in-State GHG emissions increases for several regulated sectors while significant program-level emissions reductions are associated with offset projects located outside of California. The comment expressed concern that the report has been cited as the basis for assertions that facilities using the Cap-and-Trade system are adversely impacting environmental justice communities. The comment lists deficiencies in the report, including: criteria pollutants such as respirable particulate matter (PM₁₀), directly emitted from large GHG sources, do not cause the elevated particulate levels that pose the greatest health risks in disadvantaged communities; while some large GHG emitters are using offset credits to meet a portion of their allowance obligations, this use is limited to eight percent of the entity's compliance obligation; and the Cap-and-Trade program was never intended to be a control strategy for criteria pollutant emissions. The comment notes a discussion in the Scoping Plan that existing federal. State and local air quality regulatory programs would continue to reduce criteria and TAC emissions through a comprehensive network of direct and indirect control measures, and that these measures are applicable to all emissions sources, including those covered by Cap-and-Trade. These programs have resulted in significant emissions reductions and corresponding air quality improvements, including in disadvantaged communities, despite the growth in population and vehicle use that has occurred over the same time period. The comment states that the report promotes the wrong policy outcomes by suggesting that climate programs should be leveraged for criteria and TAC emissions reductions and cites two reports that conclude these emissions should be regulated directly through such established programs, rather than indirectly as co-benefits of GHG reduction policies.

Responses to Comments

Please see Master Response No 1. No further response is required and no changes to the Draft EA are required in response to this comment.

105-6

The comment cites a 2017 report, Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities (OEHHA), and notes that the report acknowledges that there are challenges that preclude definitive conclusions regarding the impacts of the Cap-and-Trade program on disadvantaged communities.

Please see Master Response No 1. No further response is required and no changes to the Draft EA are required in response to this comment.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Kotlier, Bernie
109	IBEW-NECA
4/10/2017	

The comment recommends building electrification as a solution since there are existing fugitive emission across the gas supply chain that remain unsolved.

The comment includes a recommendation for the contents of the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA. No further response is required and no changes to the Draft EA are required.

109-2

The comment also recommends building electrification to address emissions from other fuel sources. See response to comment 109-1. No further response is required and no changes to the Draft EA are required in response to this comment.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Bloom, John
112	Coaliton for Sustainable Cement Manufacturing & Env.
4/10/2017	

The comment states that the cement industry would be subject to disinvestment and leakage if allowances are withheld from the cement industry. Discussion on allowance allocation for leakage prevention can be found at page 31 of the Draft EA.

This comment does not address the adequacy, accuracy, or completeness of the Draft EA. Nonetheless, CARB staff notes that, in the second fifteen-day package of the 2016 Cap-and-Trade Amendments, post-2020 assistance factors were deleted in response to stakeholder concerns about the leakage studies performed under contract to CARB and CARB staff's proposed methodology for developing assistance factors using these studies. These deletions have the effect of removing all post-2020 industrial allocation from the Cap-and-Trade Regulation. Staff intends to continue assessment of appropriate calculations of emissions leakage risk for the post-2020 period, and to propose post-2020 assistance factors and industrial assistance in a future rulemaking that will be initiated after the current rulemaking concludes but before vintage 2021 allocation will occur. Staff remains committed to continuing to provide industrial allowance allocation post-2020 at levels sufficient to minimize emissions leakage (per the AB 32 requirement). This industrial allocation will continue to be in the form of output-based updating allocation based on emissions intensity product benchmarks where feasible and allocation based on energy benchmarks where not. Recently enacted AB 398 provides specific direction to CARB on what the post-2020 assistance factors will be. Specifically, the bill directs CARB to set industry assistance factors for allowance allocation commencing in 2021 at the levels applicable in the compliance period of 2015 to 2017, inclusive, with a declining cap adjustment factor to the industry allocation equivalent to the overall statewide emissions declining cap using the methodology from the compliance period of 2015 to 2017, inclusive. The development of future post 2020 Cap-and-Trade amendments will have include its own more detailed process under the Administrative Procedures Act and under CARB's certified regulatory program, which includes a more focused environmental document where required. Comments related to the design of that regulation are more appropriately addressed in that rulemaking process. Additional details on the most recently Board-approved amendments to the Cap-and-Trade Regulation are available at the Cap-and-Trade rulemaking page at

https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

No changes to the Draft EA are required in response to this comment.

112-2

The comment states that there is no proof that reducing allowance allocation to the cement industry will result in a global GHG benefits. Please see response to comment 112-1. No changes to the Draft EA are required in response to this comment.

California Air Resources Board – 2017 Scoping Plan Response to Comments

Responses to Comments

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Koehler, Larissa
121	Environmental Defense Fund
4/10/2017	

The commenter states that CARB's proposed refinery measures represent a strong starting point for a measure aimed at driving faster GHG reductions that could also contribute critical public-health co-benefits for communities, and that the OEHHA report identified the refinery sector as having one of the closest links between GHGs emitted and local and toxic air pollutants. Finally, the commenter states that California should explore measures that will independently accelerate the reductions of local and TACs where possible.

Please see Master Response No 1. The comment includes a recommendation for the contents of the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA so no further response is required and no changes to the Draft EA are required.

121-2

The comment states that as a large importer of natural gas, California needs to address the potential climate and air quality damage occurring outside the State from methane leaks from pipes and equipment that produce and transport gas into California by playing an active role in efforts by other states. The commenter urges CARB to specify methods for targeting leakage reduction in upstream imported natural gas in the Scoping Plan.

This comment reflects the contents of the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA so no further response is required and no changes to the Draft EA are required. Nevertheless, CARB staff notes that pursuant to AB 1496, CARB, in consultation with scientific experts and other state, local, and federal agencies, is undertaking monitoring and measurements of high-emission methane "hot spots" and conducting lifecycle GHG emission analysis for natural gas produced in and imported into California. CARB intends to update its relevant policies and programs to incorporate any new information gathered from these efforts.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Vanderwarker, Amy
122	CA Environmental Justice Alliance
4/10/2017	

The comment cites a 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) and states that Cap-and-Trade has failed to deliver the air quality and public health benefits that environmental justice communities need and deserve.

Please see Master Response No 1. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Bullock, Mike
123	
4/10/2017	

The comment states the Scoping Plan is subject to CEQA. CARB released a Draft EA prepared in accordance with CARB's certified regulatory program and CEQA for the Scoping Plan. The Draft EA was released with the Scoping Plan on January 20, 2017 for an 80-day public review and comment period that concluded April 10, 2017. The Draft EA has been available on CARB's webpage and at CARB since the Scoping Plan was released on January 20, 2017.

Comment Letter	Golden, Rachel
139	Sierra Club
4/10/2017	

The comment states that the Scoping Plan does not adequately address GHG emissions from fossil fuel use in residential and commercial buildings and that building decarbonization is critical to achieving long-term climate goals. This comment includes a recommendation for the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA. CARB staff notes that the Draft EA analyzed the potential impacts of the measures proposed as part of the Scoping Plan scenario against the backdrop of existing conditions. For purposes of CEQA, existing GHG emissions from residential and commercial buildings are part of the existing baseline emissions and do not require further analysis in the Draft EA. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Julia, May
147	Communities for a Better Environment
4/10/2017	

The comment states pollution trading has allowed continued fossil fuel expansion and is not the solution to reduce GHG or co-pollutant emissions. The comment cites the 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) stating the report found environmental justice communities contain higher concentrations of GHGs and PM, which have increased under Cap-and-Trade. The comment states the report found facilities used mostly out-of-state offsets rather than directly reducing local emissions, and that further reductions at GHG-emitting facilities could enhance public health and environmental equity. Please see Master Response No 1.

The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Secundy, Jerry
149	CCEEB
4/10/2017	

This comment states that production leakage as noted in Alternative 4, is also true for the refinery sector measure included in the Scoping Plan scenario of the Scoping Plan. Please see response to comment 105-1.

This comment is related to the content of the Scoping Plan and Alternative 4, and does not address the adequacy, accuracy, or completeness of the Draft EA. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Bundy, Kevin
152	Center for Biological Diversity
4/10/2017	

The comment provides an introductory statement that the Scoping Plan would extend the Cap-and-Trade Program to achieve California's 2030 goal despite evidence that the program is failing to alleviate environmental burdens already disproportionately borne by low-income communities and communities of color. Please see the response to the more detailed comment in 152-4.

152-2

The comment makes an introductory statement that the Natural and Working Land recommendations could increase emissions. Please see the responses to the more detailed comments in 152-7 and 152-11.

152-3

The comment makes an introductory statement that the Draft EA fails to satisfy CEQA requirements. Please see the responses to the more detailed comments provided in 152-8 through 152-10.

152-4

The commenter cites the 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.) and states that Cap-and-Trade appears to be prolonging, and in some cases exacerbating, environmental burdens borne by low-income communities and people of color in California.

Please see Master Response No 1.

152-5

The comment states that the forest offset protocol under the Cap-and-Trade Program does not assure additionality. The comment also states that the forest offset protocol does not estimate leakage risk for each project. This comment is regarding the existing design of offset protocols within the Cap-and-Trade Program, which is a recommended measure in the Scoping Plan. The comment does not address the adequacy, accuracy, or completeness of the Draft EA, no further response and no changes to the Draft EA are required in response to this comment. CARB staff notes that the Draft EA analyzed the Cap-and-Trade measure at a programmatic level and defers more details related to specifics of the program to documents prepared for that particular rulemaking. See response to comment 93-10 regarding the level of detail required in a programmatic level EA. The post 2020 Cap-and-Trade measure as approved by the Board on July 27, 2017, underwent its own more detailed process under the Administrative Procedures Act, which included a more focused environmental document, and an opportunity to

comment on the design of that regulation, including operation of post-2020 offset protocols. Additional details may be found on the Cap-and-Trade rulemaking page at https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

CARB staff nonetheless briefly responds to these assertions below. The forest protocol, since its original adoption in 2011, has been revised and adopted by the Board twice after significant contributions from stakeholders. Contrary to the commenter's assertions, the baseline is modeled considering all legal constraints that could affect growth and harvesting scenarios. Legal constraints include all laws, regulations, legally-binding commitments, forest practice rules, Best Management Practices, covenants, conditions and restrictions, pre-existing conservations easements, Habitat Conservation Plans, Safe Harbor Agreements and deed restrictions. Projects are also required to show that the proposed baseline scenario is financially feasible. Taking all the legal and financial constraints together in the development of the project baseline assures that all GHG emission reductions and removal enhancements are truly additional.

Also, contrary to the commenter's assertion that reforestation projects do not need to account for requirements under the California Forest Practice Act in their baseline, the protocol requires that a reforestation baseline take into consideration any laws, statues, regulations, or other legal mandates that would encourage or require reforestation. Additionally, all project types are required to follow sustainable harvesting and natural forest management practices, which explicitly limit even-aged management to no greater than 40 acres and require that stands be adequately stocked with trees at least five years old or at least five feet tall.

CARB staff also disagrees with the contention that project baselines are set by comparison to surrounding lands. The project baseline is set by modeling legally permissible and financially feasible forest management. The comparison to surrounding lands is a conservative safety net to prevent project baselines from being set too low. In cases where the legally permissible and financially feasible management would generate a baseline lower than what is common practice in the immediate area, the baseline must be remodeled so that it is above common practice.

CARB staff disagrees with the commenter's assertions that projects may be placed in areas that are less commercially attractive or accessible. As part of the baseline modeling of financial constraints, the physical and biological constraints on the property must be considered. This often involves providing evidence that similar harvesting activities have recently taken place on nearby properties with similar physical attributes (slope, zoning, species composition). CARB staff also disagrees with the commenter's characterization of leakage risk. The existing leakage factor for forest projects was adopted by the Board in 2011 after extensive stakeholder commenting and readopted twice more after additional public comment. A single conservative leakage factor was selected because leakage is not only within an entity, so entity-wide reporting would not account for all leakage. Additionally, as part of the sustainable forest management requirements of the protocol, which are intended to reduce leakage, forest owners must demonstrate sustainable harvesting on all their landholdings in the U.S. when harvesting occurs in the project area. Finally, the stocking levels on landholdings

outside the project area are considered in developing the project baseline and are an additional mechanism to prevent activity shifting leakage. Altogether, CARB staff believes that the fixed 20 percent leakage factor is a conservative estimate of actual leakage risk.

152-6

The comment makes statements regarding issues with a potential international offsets program and potential linkage of California's Cap-and-Trade Program with Acre, Brazil. This comment is regarding the potential for future actions under the Cap-and-Trade Program, which is a recommended measure in the Scoping Plan. The comment does not address the adequacy, accuracy, or completeness of the Draft EA, and no further response and no changes to the Draft EA are required in response to this comment. Furthermore, the development of the post 2020 Cap-and-Trade measure which was recently approved by the Board on July 27, 2017 underwent its own more detailed process under the Administrative Procedures Act, which included a more focused environmental document. Comments related to the particular design of that regulation, which did not include amendments to link with Acre, Brazil, were addressed in that rulemaking process. Comments on any future proposed amendments to the Cap-and-Trade Regulation may be addressed in future rulemaking processes. Additional details on the most recently-approved Cap-and-Trade Regulation amendments may be found on the Cap-and-Trade rulemaking page at

https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

152-7

The comment states that the Scoping Plan scenario's assumption that emissions from biomass, including bioenergy and biofuels production, are zero is arbitrary and scientifically unsupported and legally indefensible. This comment is related to the characterization of GHG emissions from bioenergy in the Scoping Plan and does not specifically speak to the adequacy, accuracy, or completeness of the Draft EA. No further response and no changes to Draft EA are required. CARB staff notes that Energy and Environmental Economics (E3) aligned PATHWAYS with CARB's GHG Inventory accounting, which classifies CO₂ from biomass combustion as biogenic CO₂ and tracks these emissions separately as excluded emissions relative to statewide GHG targets; the combustion methane and N2O emissions from biomass generation are included emissions and accounted for towards GHG targets. This aligns with Intergovernmental Panel on Climate Change (IPCC) guidelines, U.S. EPA's national GHG inventory, and other nations' inventories submitted to the United Nations Framework on Climate Change (UNFCC). Furthermore, State policy generally supports bioenergy as an alternative to fossil fuels. Urban, agricultural, and forest wastes that would otherwise go to landfills or be burned can, instead, be used to produce electricity, transportation fuels, and combined heat and power. Using biomass waste also complements other State mandates, such as waste diversion, fire-risk reduction, and adaptation. Reported climate benefits aside from displacement of fossil fuels, the Draft EA recognizes that biomass combustion does emit criteria pollutants and TACs (see Draft EA at p.59), but notes that significant increases in the levels of these pollutants

would be regulated through the local air district permitting process. Overall, deploying more renewable energy would reduce fossil-fuel power plant electricity generation and therefore decrease associated air emissions (see Draft EA at pp.59-60).

152-8

The comment states that the Draft EA fails to disclose, evaluate, or propose mitigation for impacts of the Natural and Working Lands strategy. As explained in chapter 2.0, section A. of the Draft EA, although the Scoping Plan broadly discusses climate policy efforts underway or being contemplated across state government, the Draft EA is focused on those core measures recommended in the proposed scenario in chapter II of the Scoping Plan to achieve the 2030 target. As explained further in the Draft EA, those measures in chapter II are the "project" for purposes of CEQA. The Natural and Working Lands sector is discussed in chapter IV of the Scoping Plan, along with other broad strategic options and complementary and supporting measures being contemplated or undertaken within the State to support the state's long-term GHG reduction goals and support the specific measures recommended in chapter II of the Scoping Plan. Therefore, it is not evaluated in the Draft EA prepared by CARB for the Scoping Plan. CARB notes that development of a Forest Carbon Plan, as a recommendation in the 2014 Scoping Plan Update, was discussed at a programmatic level in the EA certified for that update. Please refer to that EA, included as Appendix F to the 2014 Scoping Plan available on CARB's webpage at: https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. No changes to the Draft EA are required in response to this comment. Please also see response to comment letter 57.

152-9

The comment states the Draft EA fails to address GHG emissions from increased bioenergy development, which includes biomass generation and biofuels facilities. The commenter states the GHG chapter of the Draft EA either omits or cursorily mentions impacts associated with biomass facility development, including construction-related emissions.

Please see the response to comment 152-7 for a discussion of GHG emissions from bioenergy and inclusion in the CARB's GHG Inventory. In terms of the level of detail in addressing GHG emissions from new bioenergy and biomass facilities in the Draft EA, it is important to note that those facilities, as reasonably foreseeable aspects of implementation of SB 350 in the Scoping Plan, are just one aspect of numerous recommended measures considered cumulatively in the GHG section of the Draft EA, which correctly concludes at this programmatic level that GHG emissions will decrease from implementation of the Scoping Plan. There is no requirement, nor is it feasible in this level of EA, to provide more detailed quantitative analyses of each potential action (e.g. potential new facilities) that could occur for each measure for both construction and operational emissions. The purpose of the Scoping Plan is to identify the next steps for continuing GHG reductions beyond 2020 to achieve the 2030 target. The level of detail in the Draft EA reflects that the project is a broad statewide planning document

that represents an initial planning step, and individual measures will be subject to their own extensive public regulatory development process. California law and policy require a careful, open, and public process when regulations are being developed. As part of that process, the lead agency will conduct an extensive evaluation of the feasibility and potential impacts of proposed regulatory actions consistent with the Administrative Procedure Act and other mandates (e.g., CEQA, AB 32, SB 350, SB 1383). The Draft EA for this initial planning document does not, and cannot, provide the level of detail that will be provided in subsequent environmental documents prepared for specific regulatory actions that CARB or other agencies pursue to reduce GHG emission or for permits or entitlements approved for individual new facilities. Please refer to comment 93-10 for more details about the legal requirements pertaining to programmatic level EIRs and why that is appropriate for this EA.

152-10

The comment states the alternatives analysis in the Draft EA is inadequate. First, the comment states the project objectives used to evaluate the alternatives in the Draft EA differ somewhat from the policy criteria used to compare the alternatives to the proposed scenario to other alternatives described in the Scoping Plan, specifically with regard to the reference to linkages. Pursuant to CARB's certified regulatory program, chapter 7 of the Draft EA contains an analysis of a reasonable range of alternatives, including a discussion of each alternative's feasibility and the likelihood that it will substantially reduce any significant adverse environmental impacts identified in the impact analysis contained in chapter 4 of this Draft EA. (Cal. Code Regs., tit. 17, §§ 60005(b), 60006.) Please refer to the introduction to the alternatives analysis in chapter 7 of the Draft EA for more details regarding the requirements to prepare an alternatives analysis under CARB's certified regulatory program and CEQA and the approach to selecting the alternatives for the Draft EA. The Draft EA drew from the alternatives discussed in the Scoping Plan; however, because the purposes of the two alternatives analyses are different, the approach and objectives/criteria analyses may differ somewhat. The purpose of the alternatives analysis in the Draft EA is to examine a reasonable range of potentially feasible project alternatives, with a focus on alternatives that can potentially eliminate or reduce significant impacts of the project. The alternatives discussed must be able to attain the most basic project objectives, but do not need to be able to implement all of them. Therefore, it is not essential that the project objectives within the Draft EA align perfectly with the policy criteria in the Scoping Plan, or that the Draft EA examine each alternative's relative benefits in terms of different types of "linkages" as the commenter suggests. The comment also states that the Draft EA fails to establish that the non-Cap-and-Trade alternatives are actually infeasible. Alternatives are an important part of the CEQA process, but the determination of whether they are feasible or not does not have to be included in the environmental document. That determination may be reserved for the findings made by the decision makers at the time of project approval. (See Cal. Code Regs, tit. 14, §15091.) In Sierra Club v. County of Napa (2004) 121 Cal. App. 4th 1490, the Court of Appeal found that the lead agency must analyze in the environmental impact report (EIR) those alternatives that are potentially feasible, and disclose alternatives rejected as infeasible. The lead agency is ultimately responsible for determining, based on

information in the record, the feasibility of the alternatives in its findings, and whether the benefits outweigh the significant effects, in its statement of overriding considerations. The record can include information that is not in the EIR itself. The court in *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco*, (2002) 102 Cal.App.4th 656 reached the same conclusion finding that an EIR "is an informational document, not one that must include *ultimate* determinations of economic feasibility" (emphasis added). In addition, "nowhere does the statute mandate that the EIR *itself* also contain an analysis of the feasibility of the various project alternatives or mitigation measures that it identifies" (emphasis in original). Under CARB's process, the findings of infeasibility of the alternatives is included in the findings adopted by the Board as part of its approval of the project. As part of those findings, the Board may rely on information not in the Draft EA itself, e.g. other policy criteria and information within the Scoping Plan and its appendices.

The comment also recommends identifying and evaluating the most cost-effective measures for closing the gap between the reductions expected to be achieved by refinery measures and the reductions necessary to meet the 2030 target. Issues of cost effectiveness are not environmental impacts and do not need to be considered in an EA, though that may be a consideration in the Board's ultimate findings regarding the feasibility of alternatives. Although the comment does not identify what measures should be evaluated as part of this proposed additional alternative, it appears that this suggested alternative does not substantially differ from Alternative 2 examined in the Draft EA. The Draft EA already includes a variety of reasonable alternatives sufficient for informed decision-making, including one that examined a 30% reduction refinery measures combined with other measures to essentially "close the gap."

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Arguello, Martha
155	
4/10/2017	

The commenter states that Cap-and-Trade is likely to push emissions toward disadvantaged areas because it does not provide limits on individual facilities or areas and that disadvantaged communities were rightly concerned that the Cap-and-Trade Program could allow for increases in toxic emissions to be disproportionately distributed toward already disproportionately impacted communities.

Please see Master Response No. 1

This comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Hughes, Gary
156	Friends of the Earth
4/10/2017	

The comment states that the Draft EA should include an analysis of the Forest Carbon Plan. Please see response to comment letter 57.

156-2

The comment expresses concerns about CARB's consideration of Environmental Justice Advisory Committee (EJAC) recommendations in the Scoping Plan. The comment specifically notes EJAC's recommendation to exclude Sector-Based Offsets (REDD-based offsets) from future iterations of the Cap-and-Trade Program. This comment is a recommendation regarding the specifics of a measure in the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA, and no further response is required. See also response to comment 152-6.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Rudolph, Linda
160	Center for Climate Change and Health
4/10/2017	

The comment recommends a more robust consideration of health impacts. See response to comment 41-1.

This comment includes a recommendation for the contents of the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Newell, Brent
166	Center on Race, Poverty & the Environment
4/10/2017	

The comment provides an introductory statement that the Draft EA fails to adequately analyze and mitigate the Cap-and-Trade measure air quality impacts on public health. Please see the response to the more detailed comment 166-4.

166-2

The comment cites conclusions from the 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.). It states the Scoping Plan fails to discuss this report, and the report demonstrates that the Cap-and-Trade measure disparately affects communities of color, denies communities the benefits of on-site reductions and GHG reductions attributed to Cap-and-Trade occur primarily outside of California.

Please see Master Response No. 1.

166-3

The comment states CARB failed to undertake any meaningful analysis of alternatives, undermining CEQA's goal of fostering informed decision-making and public participation. Please see response to comment 152-10 regarding the alternatives analysis in the Draft EA and CEQA's standards. The comment then describes ways in which the commenter believes the Scoping Plan's analysis of the carbon tax alternative is inadequate. Although the commenter initially made statements regarding CEQA's requirements for an alternatives analyses, this portion of the comment is regarding policy aspects of the alternatives discussed in the Scoping Plan itself, and does not specifically address the adequacy of the alternatives analysis provided in the Draft EA prepared under CARB's certified regulatory program. The comment appears to disagree with statements in the Scoping Plan that find that the carbon tax alternative does not meet several policy criteria. It is important to note that the alternatives discussed in the Scoping Plan are separate from, and prepared for different purposes than, the alternatives analysis in the Draft EA. Reasons provided in the Scoping Plan for not pursuing alternatives, including the carbon tax alternative, are distinct from CARB's obligation to consider alternatives in the Draft EA, and for the Board to make findings regarding the feasibility of those alternatives when considering the Scoping Plan for approval. The comment further states that the Draft EA does not adequately explain why Alternatives 3 and 5 would not meet Objectives 1 and 2, is conclusory in its statements regarding the effectiveness of these alternatives in eliminating leakage, and the Draft EA thereby improperly dismisses these alternatives. Although CARB prepares its alternatives analysis under its certified regulatory program, the CEQA statute and Guidelines provide some useful information as guidance. The CEQA Guidelines state that the basic purpose of an alternatives analysis is to suggest ways the project

objectives might be achieved with fewer environmental impacts, and the alternatives discussed should be able to attain most of the basic project objectives. (Cal. Code Regs, tit. 14, §15126.6, subd. (a).) The discussion of how well Alternatives 3 and 5 meet all of the Objectives, including Objectives 1 and 3, are there to show how well each alternative meets the basic project objectives. Contrary to the commenter's statements, these statements are not there primarily to dismiss these alternatives in the Draft EA. The brief statements made in the Draft EA are sufficient for this more limited purpose and are supported by the information in the Scoping Plan and entire administrative record. Alternatives are an important part of the CEQA process, but the determination of whether they are feasible or not does not have to be included in the environmental document and the statements regarding how well each alternative meets the objectives is not CARB's findings of feasibility of Alternatives 3 and 5. Under CARB's process, the findings of infeasibility of the alternatives discussed in the Draft EA is included in the findings adopted by the Board as part of its approval of the project. As part of those findings, the Board may rely on information in Draft EA itself, including the objective discussion, or on other information throughout the record. Please see response to 152-10 for more information regarding findings on the feasibility of alternatives under CEQA.

The comment also states the analysis fails to analyze whether the Cap-and-Tax alternative would be the environmentally superior alternative. It is not clear if this is a reference to the alternatives analysis within the Draft EA or the Scoping Plan. Assuming it is in reference to the Draft EA, neither CARB's certified regulatory program, the CEQA statute, nor the CEQA Guidelines expressly require an EIR to identify the environmentally superior alternative. The CEQA Guidelines state that if the "no-project alternative" is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives. (Cal. Code Regs, tit. 14, §15126.6, subd. (e)(2).) This Guidelines section is not directly applicable to CARB's alternatives analysis prepared under its certified regulatory program because it is providing more detailed guidance regarding the contents of an EIR prepared under chapters 3 and 4 of the CEQA statute, which CARB is expressly exempted from under its certification under Public Resources Code section 21080.5. Nonetheless, even if this CEQA Guidelines section is applied as guidance for CARB's program, since the No Project Alternative analyzed in the Draft EA is not clearly environmentally superior. there is no need to identify an environmentally superior alternative among the other alternatives. Furthermore, because none of the alternatives discussed in the Draft EA is clearly environmentally superior, the Draft EA's discussion of the environmental advantages and disadvantages of each alternative in comparison to the proposed scenario is sufficient. (See Kostka and Zischke, Practice under the Environmental Quality Act, 2nd edition (with 2016 updates), §15.37.) No changes to the Draft EA are required in response to this comment.

166-4

The comment states the Draft EA failed to adequately consider and analyze air quality impacts from the Cap-and-Trade Program. The Draft EA includes an analysis of potential air quality impacts of the Cap-and-Trade measure on pages 66-67. That analysis states a more stringent post-2020 cap-and-trade program will provide an

incentive for covered facilities to decrease GHG emissions and any related emissions of criteria and toxic pollutants. The analysis also refers to CARB's Co-Pollutant Emissions Assessment (Appendix P of the Staff Report: Initial Statement of Reasons Proposed Regulation to Implement the California Cap-And-Trade Program), which contains a more detailed evaluation of air emissions from when the Cap-and-Trade Regulation was first proposed. It is important to keep in mind that the Draft EA prepared for the Scoping Plan provides a higher level programmatic analysis of the Cap-and-Trade measure, and the level of detail in the Draft EA reflects that the project is a broad statewide planning document that represents an initial planning step, and individual measures will be subject to their own extensive public regulatory development process. The development of the post 2020 Cap-and-Trade measure which was recently approved by the Board on July 27, 2017, underwent its own more detailed process under the Administrative Procedures Act, which included a more focused environmental document. Comments related to the design of that regulation and its potential environmental impacts were addressed in that rulemaking process. Additional details may be found on the Cap-and-Trade rulemaking page at

https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

Please also see Master Response No 1 regarding the Cushing Report, OEHHA Report, and emissions from Cap-and-Trade covered facilities. No changes to the Draft EA are required in response to this comment.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Weiskopf, David
167	Nextgen Climate America
4/10/2017	

The top of the comment letter states in the summary that it is a comment on the Draft EA, but the letter makes no specific comments on the adequacy, accuracy, or completeness of the Draft EA or impacts of the Scoping Plan covered by the Draft EA. No further response can be provided.

167-2

The comment states that fossil fuel power plants, and in particular peaker plants, have local environmental and health impacts, which are borne disproportionally by disadvantaged communities. This comment is pointing to existing emissions that are part of the existing conditions baseline and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. CARB staff notes that the Draft EA does discuss the operational air quality impacts of electricity supply for measures in the Scoping Plan against the backdrop of existing environmental conditions as required by CEQA. Please see pages 59-60 of the Draft EA.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Martinson, Cara
172	California State Association of Counties
4/10/2017	

The header to the comment letter references the Draft EA, but the letter itself makes no specific comment on the adequacy, accuracy, or completeness of the Draft EA and does not raise significant environmental issues related to the Draft EA. No further response can be provided. The comment letter is noted and is being provided to the Board members for their consideration, but no further response or changes to the Draft EA are required in response to this letter.

Comment Letter	O'Brien, Rachel
175	Agricultural Council of California
4/10/2017	

The comment states that the Cap-and-Trade measure as proposed could increase emissions leakage and have a negative impact on global GHG emissions. This comment is regarding the adequacy of a particular measure to achieve the 2030 target and includes a recommendation for particular measures in the Scoping Plan, but does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA. Nonetheless, CARB staff notes the Scoping Plan measures are evaluated in the Draft EA, which includes a discussion on allowance allocation for leakage prevention. Please see response to comment 112-1. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this letter.

Comment Letter	Bundy, Kevin
183	Center for Biological Diversity
4/10/2017	· ·

The comments presented in this letter contain identical text to comment letter 152, with the exception of attached reference materials. Please refer to the responses to comment letter 152.

Comment Letter	Edgar, Evan
190	CA Compost Coalition
4/10/2017	

The comment states that the Draft EA needs to recognize baseline conditions for organic waste management practices. See response to comment 24-3.

190-2

The comment cites a section of the Draft EA relates to SLCP measures and states that CARB should prepare a Program EIR for CASP compost issues. This comment is noted. This comment does not address the adequacy, accuracy, or completeness of the Draft EA prepared for the Scoping Plan. No changes to the Draft EA are required in response to this comment

190-3

The comment states the Draft EA needs to recognize the net benefit of both greenhouse gas reductions and criteria pollutants can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities. Please see response to comment 24-4.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

No changes to the Draft EA are required in response to this letter.

Comment Letter	Severson, Dan
191	Turlock Irrigation District
4/10/2017	

The comment is regarding the four alternatives discussed in the Scoping Plan. This comment is regarding the contents of the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. CARB staff does note that the Draft EA did analyze each of these alternatives for purposes of CARB's certified regulatory program under CEQA. Please see chapter 7 of the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required. No changes to the Draft EA are required in response to this comment letter.

Comment Letter	Haya, Barbara
192	Berkeley Energy & Climate Institute
4/10/2017	

The comment states that providing a new source of profits for specific project types eligible for offset sales could create perverse incentives that lead ultimately to emission increases. The comment also states that the reductions of any offset program are uncertain due to uncertainty in the proportion of non-additional projects and offsets could risk generating profits large enough to increase production of high emitting products.

This comment is regarding the current operation of the Cap-and-Trade Program, which is recommended to continue post-2020 in the Scoping Plan, and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA.

Nonetheless, CARB staff strongly disagrees with the commenter's assertions and notes that the post-2020 Cap-and-Trade measure, which is proposed with continuing offsets, is analyzed in the Draft EA. In the Draft EA at chapter 4.0 "Impacts Analysis and Mitigation Measures," there are multiple references to the fact that "Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations." Furthermore, the Compliance Offset Protocols, in conjunction with all of the strict and thorough requirements in the Cap-and-Trade Regulation regarding offsets, meet the requirements of AB 32. The Compliance Offset Protocols adopted under the Cap-and-Trade regulation have been established through a public process with multiple opportunities for stakeholder input and use conservative methods to account for uncertainty and emissions leakage and to establish the additionality of offset projects in setting project baselines. In addition, precautions are taken to ensure that the greenhouse gas reductions and greenhouse gas removal enhancements being credited as offsets are real, additional, quantifiable, permanent, verifiable, and enforceable. Importantly, CARB's method of implementing the statute with respect to offsets was upheld by the First District Court of Appeals in *Our Children's* Earth Foundation v. ARB (2015) 234 Cal. App. 4th 870. See also Master Response No. 1. Lastly, the commenter incorrectly believes the California Cap-and-Trade Program offset requirements are similar to the offset requirements under the Clean Development Mechanism. These are two completely different programs, each with very different design features.

No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Daryanani, Nikita
202	
4/10/2017	

The commenter states that carbon offsets provide industry with compliance flexibility, but result in outsourced benefits and negative impacts on California's disadvantaged communities. The commenter cites the 2016 report, A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program (Lara J. Cushing et al.). The comments states that the Cap-and-Trade regulation has allowed in-state emissions to rise, with the largest GHG emitters reporting increases in their localized emissions since 2011. The commenter states that the report found that these high emitting facilities more likely to use out-of-state offset projects to meet their emission reduction obligations and that the Cap-and-Trade measure has allowed for increased harm to disadvantaged communities while outsourcing California's potential climate and health benefits. Please see Master Response No. 1.

This comment is regarding the design of a particular measure in the Scoping Plan and does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Fletcher, Chanell
203	ClimatePlan
4/10/2017	

The comment recommends an analysis of public health impacts of the Scoping Plan. See response to comment 41-1. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Newell, Brent
204	Center on Race, Poverty & the Environment
4/10/2017	•

The comments presented in this letter contain identical text to comment letter 166, except for an additional signatory. Please refer to the responses to comment letter 166.

Comment Letter	Morgan, Ken
Late 1	Tesla
4/10/2017	

Late 1-1

The comment references a portion of the Draft EA that describes Behind-The-Meter Photovoltaics (PV) and states while the description is a "fair assessment" of the measure, the comment recommends additional clarifications for the description. The referenced part of the Draft EA is a summary description of the Scoping Plan measure that is part of a "known commitment" described as "Renewable Energy and Energy Efficiency, Including SB 350." The description of the Behind-The-Meter PV measure in the Project Description of the Draft EA is a summary of the measure and is considered sufficient to describe the potential compliance responses, which form the basis for the impact analysis in chapter 4 of the Draft EA. The commenter's clarifications are noted, however, the comment does not raise any issues regarding the adequacy of the impact analysis based on the existing description. CARB staff believes that while this additional information is helpful for the record, these additional details don't affect the environmental impacts analysis, so the Draft EA description is not being modified since the current description provides an adequate summary for purposes of the programmatic environmental impacts analysis. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Jaktkar, Shrayas
Late 2	Coalition for Clean Air
4/11/2017	

Late 2-1

The comment expresses concerns related to localized air pollution potentially resulting from the Cap-and-Trade measure. Please refer to Master Response No. 1.

Late 2-2

The commenter states that they support greater in-state generation of low carbon fuels, but the commenter states that CARB must take steps to prevent or minimize the adverse impacts of fuel production and distribution on communities living near such facilities. Specifically, the commenter states that policy makers should safeguard against concentration of natural gas and other fuel depots in disadvantaged communities because of the potential for increased truck traffic and other problems in already impacted areas. This comment is more of a recommendation on how to implement specific measures recommended as strategies in the Scoping Plan (specifically a more stringent LCFS) in the future, and does not does not directly raise an issue related to the adequacy, accuracy, or completeness of the Draft EA for the Plan as a whole. CARB staff notes that the Draft EA did analyze the potential for adverse environmental impacts, at a programmatic level, for all Scoping Plan measures, including the LCFS measure. Specifically with regard to commenter's concerns regarding truck traffic, the Draft EA discusses the potential for air quality impacts (pg. 66) and potential traffic and transportation impacts (page 146-147). The Draft EA provides a high-level analysis of these issues because the details regarding the specific location of facilities, whether in disadvantaged communities or not, cannot be known or planned for at this scoping plan strategy level, and the details of potential adverse impacts are too speculative to describe for this Draft EA. The development of the LCFS measure (i.e., a rulemaking) would undergo a more detailed process under the Administrative Procedures Act, including technical, environmental, and economic analyses, and public review and input specific to that proposal. Such policy considerations regarding the design of the regulation are appropriately considered during that process. The policy recommendation made by the commenter is however noted. No changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Wilson, Dawn
Late 3	Southern California Edison
4/10/2017	

Late 3-1

The comment states that the EA and Economic Analysis support the Scoping Plan as the best of all considered alternatives. The EA and Economic Analysis evaluate the Scoping Plan and alternatives, but do not make conclusions related to the best alternative. The comment is noted. No changes to the Draft EA are required in response to this comment.

Late 3-2

The comment states that further efforts to promote electrification could alter emissions outcomes across sectors but will likely result in a reduction of overall statewide GHG emissions. As the comment itself acknowledges, this comment is not directly related to the CEQA analysis (e.g. the Draft EA) conducted for the Scoping Plan. Rather this comment is a recommendation related to the electricity sector measure (specifically SB 350) in the Scoping Plan. The comment is noted but no changes to the Draft EA are required in response to this comment. The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comment letter is noted and being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Clark, Margaret
Late 7	LA County Solid Waste Management Committee
10/17/2017	

Late 7-1

The comment states that the Final EA or final Scoping Plan should quantify and compare the emissions, health, and economic impacts of different end uses of organic waste, including biofuels, electricity, pipeline biogas, and compost. See response to comment 104-1.

Late 7-2

The comment states that in describing the impacts of known commitments, beginning on page 12 of the Draft EA, the Final EA should compare the environmental impacts, including life-cycle GHG emissions, of the use of low carbon fuels as part of the Low Carbon Fuel Standard with the use of zero emission vehicles (ZEVs) as part of the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy. See response to comment 104-2.

Late 7-3

The comment states that zero emission vehicles (ZEVs) use lithium batteries. As stated in the Draft EA, the increased use of ZEVs will result in an increased need for lithium battery manufacturing and recycling (page 23). Low-nitrous oxide (NOx) engines fueled by renewable natural gas (RNG) produced from solid waste will result in greater GHG reductions without producing additional hazardous waste in the form of batteries. For certain vehicle types, low-NOx engines using RNG may be a more effective than ZEVs for reducing GHG emissions. In the description of measures under the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy, the Final EA should include a description of the benefits of using low-NOx engines for vehicles such as on-road heavy-duty vehicles (page 18). See response to comment 104-5.

Late 7-4

The comment states that in the Draft EA, methane reduction measures under the SLCP Strategy (described on pages 61 and 97) and fugitive methane emissions reduction measures (described on page 151) include AD and composting. The methane reduction measures need to include thermal CT facilities. Thermal CTs are able to handle a wide variety of wastes, such as contaminated recyclables, medical waste, hazardous waste, or mixed materials such as goods made of more than one type of plastic, for which

Responses to Comments

other processes, such as AD, composting, and recycling, may not be suitable. See response to comment 104-4.

Late 7-5

The comment states that the implementation of the Scoping Plan could result in an increased rate in turnover of vehicle fleets to increase the use of zero-emission technologies (page 149 of Draft EA). The Draft EA also states that these vehicles would need to be recycled or shipped for use outside of California (page 150). The Final EA should include a statement that the use of RNG produced from solid waste will result in greater GHG reductions and produce less waste from existing fleets being replaced by ZEVs. See response to comment 104-5.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comment letter is noted and being provided to the Board members for their consideration, but no further response to this letter is required.

Comment Letter	Phillips, Kathryn
Late 8	Sierra Club California
11/22/2017	

Late 8-1

The comment recommends that further efforts to promote building electrification be included in the Scoping Plan. The Scoping Plan recognizes the importance of building electrification as one option in transitioning to cleaner heating fuels, and achieving the SB 350 mandate of doubling statewide energy efficiency savings in electricity and natural gas end uses by 2030. Specifically:

"...achieving significant GHG emissions reductions can only be achieved by decarbonizing the electricity sector – switching from natural gas end uses to electricity generated by burning natural gas would not be effective." (page 98)

The specific actions and steps needed to achieve the SB 350 objective of doubling energy efficiency savings by 2030 are left to the implementing agency (Table V-1, page 154). This comment does not raise significant environmental issues related to the Draft EA. The comments are noted and are being provided to the Board members for their consideration, but no further response to this letter is required.

Late 8-2

The comment states that the Scoping Plan overstates the role of renewable natural gas in decarbonizing buildings.

While the comment suggests that the Scoping Plan should go further to reduce existing levels of GHG emissions, the comment does not identify any new or more significant environmental impacts or otherwise raise any significant environmental issues that would result from the Scoping Plan. Therefore, no changes to the Draft EA are required in response to this comment.

The comment quotes page 98 of the Scoping Plan. However, the comment does not recognize that the Scoping Plan provides examples of both renewable natural gas (RNG) and electrification as means to transitioning to cleaner heating fuels:

"Transitioning to cleaner heating fuels...can include use of renewable gas and solar thermal, as well as electrification of end uses in residential, commercial, and industrial sectors." (Page 98.)

The renewable-natural-gas-related Scoping Plan language quoted in commenter's letter expressly is directed toward "end uses that must continue to rely on natural gas". This language should not have the effect of discouraging electrification where electrification is possible.

In addition, the Scoping Plan recognizes the need to decrease reliance on fossil fuels. Specifically, one of the main goals for the electricity and natural gas sectors respectively is to "Reduce fossil fuel use" (page 99) and to "Reduce dependence on fossil natural gas" (page 99). This objective is reiterated as a means of achieving the State's climate targets, specifically: "Moving forward, reducing use of fossil natural gas wherever possible will be critical to achieving the State's long-term climate goals" (page 98).

Late 8-3

The comment states that use of anaerobic digesters for production of RNG can reduce methane emissions from manure waste, but they can also worsen air quality by increasing ammonia and nitrous oxide levels.

At this time, the specific location, type, and number of dairies that would install digesters cannot be known and would be dependent upon a variety of factors that are not within the control or authority of CARB.

The use of digester systems in conjunction with dry manure management practices could potentially reduce odors, and emissions of VOCs, ammonia, and hydrogen sulfide associated with existing flush-water lagoon management systems.

RNG produced from anaerobic digesters that is then combusted as a vehicle fuel may produce NOx emissions, but would be expected to potentially reduce mobile source NOx emissions from non-renewable petroleum fuels by replacing petroleum-based fuels. Natural gas vehicles may produce less NOx emissions (and potentially, substantially less) than vehicles using petroleum fuels, and may offer net reductions in other potentially harmful pollutants (e.g. diesel PM), especially when offsetting diesel fuels.

Increasing use of fuels that result in lower NOx emissions than gasoline and diesel would contribute to attaining ambient air quality standards. The lower NOx emission rates of RNG vehicle fuels, when compared to gasoline and diesel fuels, may result in a statewide net reduction in NOx emissions.

However, on an individual digester level, the operation of any digesters installed at existing or new dairies could potentially increase localized criteria pollutant emissions, but could also ultimately decrease them. The quantity and type of emission increases would be dependent of the type of digester technologies installed and the end use of captured biogas, but may include NOx emissions in addition to carbon monoxide (CO), PM, oxides of sulfur (SOx), and VOCs.

Viewed in isolation, equipment associated with digesters and related manure management could also potentially increase NOx emissions, a precursor to the formation of ozone, at the individual dairy level. Digesters may also install combustion systems to dispose of collected methane vapors. Combustion/flaring of gas associated with digesters combined with biogas cleaning and compressing facilities could potentially increase NOx emissions at the individual dairy level. However, flares at digesters would not be expected to operate except for emergency purposes. Moreover, local air quality permits would be required, which is intended ensure that an air basin does not go out of attainment for ambient air quality standards. Also, as mentioned above, biogas produced by the digesters may be used to displace higher-emitting fuels. For additional discussion regarding NOx implications of dairy digesters, please see the discussion starting at page 4-17 of the March 14, 2017 Final EA prepared for the Revised Proposed Short-Lived Climate Pollutant Reduction Strategy. Please see also the discussion regarding air quality implications of each of the measures, as well as for the overall Scoping Plan (proposed project), in Chapter 4 of the Scoping Plan Final EA.

Furthermore, with regard to NOx implications of the LCFS more generally, pursuant to the writ of mandate issued by the Fresno Superior Court (Superior Court) in *POET, LLC v. California Air Resources Board* on October 18, 2017, CARB is currently addressing whether the LCFS regulation is likely to have caused an increase in NOx emissions related to the use of alternative diesel fuels in the past. CARB is also addressing whether the LCFS is likely to cause an increase in NOx emissions in the future. CARB staff believes that in conjunction with anticipated regulatory amendments to the LCFS program and other remedial measures, any potential NOx impacts from the LCFS measure will be successfully mitigated in accordance with CEQA.

In the event that dairy operators choose to transport manure offsite for centralized digestion, NOx and PM emissions could increase with any increase in the use of internal combustion engines. However, the increased availability of RNG could encourage investment in RNG-powered trucks, which could then reduce harmful NOx and particulate matter emissions, as discussed above.

In sum, the operation of digesters at dairies could decrease or increase criteria air pollutant emissions depending on many factors, including the quantity and type of digester technologies installed and the end use of captured biogas. The installation and operation of digester systems at dairies would be subject to stationary source permitting rules and regulations.

Use of anaerobic digesters for production of RNG could lead to significant reductions of manure methane emissions, while also improving air quality in surrounding communities. Negative impacts are also possible, however, depending on implementation choices. CARB and other implementing agencies will carefully consider these factors during program design and implementation going forward.

-

⁶ Available at https://www.arb.ca.gov/cc/shortlived/meetings/03142017/appendixe.pdf.

As discussed in the Draft EA, the Scoping Plan measures, taken together, would achieve beneficial impacts to air quality across the state.

The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment.

Late 8-4

The comment provides a quote from the Union of Concerned Scientists that states that once biomethane is injected into a natural gas pipeline, its environmental impacts parallel those of natural gas. In addition, the comment states that leaks in the natural gas distribution system can erode any climate benefits associated with using methane as a fuel.

The Scoping Plan does not in any way increase natural gas consumption. In fact, the Scoping Plan explicitly recognized the need to decrease dependence on fossil fuel. Specifically: "Reducing use of fossil natural gas wherever possible will be critical to achieving the State's long-term climate goals" (page 98). As a means of transitioning to cleaner heating fuels, RNG could displace other fossil-derived natural gas in the pipeline system. But again, the Scoping Plan would not increase natural gas consumption; the use of RNG would simply be an alternative to existing demand for fossil-derived natural gas. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment.

Late 8-5

The comment states that the gas industry is stating that the Scoping Plan states that no electrification is necessary to achieve climate goals, and that the only fuel switching that is needed is gas to renewable gas. This is simply not true. The Scoping Plan identifies higher-level objectives of transitioning to cleaner heating fuels and to doubling energy efficiency savings in electricity and natural gas end uses by 2030. The means of achieving these higher-level objectives are exemplified by the use of renewable gas and electrification of end uses. The specific details are delegated to implementing agencies identified in Table V-1.

The remainder of the comment letter does not raise significant environmental issues related to the Draft EA. The comment letter is noted and being provided to the Board members for their consideration, but no further response to this letter is required.

February Joint CARB/EJAC Meeting 2/15/2017

The following comments can be found in the transcripts from the February 15, 2017 Joint CARB/EJAC Meeting at: https://www.arb.ca.gov/board/mt/2017/mt021517.pdf. The comments below were conservatively determined to raise significant environmental issues related to the analysis in the Draft EA and are therefore responded to in this document.

February EJAC Meeting – 1

The comment expresses concerns related to increased air pollution resulting from the Cap-and-Trade program. Please see Master Response No. 1.

February EJAC Meeting – 2

The comment states that there is a strong correlation between GHGs and criteria/toxics pollutants, and that offsets are outsourcing emissions reductions from California. Please see Master Response No. 1.

February EJAC Meeting – 3

The comment expresses concerns related to localized air pollution resulting from the Cap-and-Trade program. Please see Master Response No. 1.

February EJAC Meeting – 4

The comment expresses concerns related to localized air pollution in environmental justice communities resulting from the Cap-and-Trade program. Please see Master Response No. 1.

February EJAC Meeting – 5

The comment states that covered emissions are increasing in some communities. Please see Master Response No. 1.

February EJAC Meeting - 6

The comment expresses concerns related to the local action recommendations in the Scoping Plan. Specifically, the commenter states that chapter refers to a system run by CAPCOA that would allow developers to purchase offset credits when the project's "VMT is beyond a level that is mitigatable." The commenter points out that the EJAC recommended this be removed from the Scoping Plan. This comment is regarding the guidance in a chapter of the Scoping Plan for local government actions to support statewide long term GHG goals. This comment is not about a measure in the Scoping Plan. The measures recommended to achieve the 2030 target are found in chapter II of

the plan. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA prepared for the Scoping Plan (which is based on the measures recommended in chapter II), so no further response is required and no changes to the Draft EA are required in response to this comment. CARB staff, nonetheless, notes that chapter V states: "CAPCOA has developed the GHG Reduction Exchange (GHG Rx) for CEQA mitigation, which could provide credits to achieve additional reductions." This statement about CAPCOA's RX does not state what the commenter says it does. It simply points to the GHG RX as one potential source for GHG credits for development projects, without any statement of the source of the GHG emissions (e.g., the credits could be generated from activities related to energy use, water use, or VMT). The chapter in fact supports the commenter's stated preference for projects to reduce VMT to the degree feasible. It states: "To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally." It is also important to note that CARB does not have authority over approving development projects and how CEQA mitigation, if any, is required or implemented. This is within the jurisdictions of local governments with authority over land use (e.g. permitting, zoning, etc.). CARB provided this information as guidance because CARB recognizes that local policy makers are critical in reducing the carbon footprint of cities and counties, but the decision of local governments to follow this guidance is voluntary. Implementation of CEQA is also exclusively within the discretion of the local agency taking approval action on particular development projects.

February EJAC Meeting – 7

The comment expresses concerns related to criteria air pollutions from dairies. Please see response to comment 89-5 for more details regarding the Draft EA analysis of the SLCP measure, which includes regulation of dairies. SLCP measures under the Scoping Plan include solid manure management practices in conjunction with digester systems could potentially reduce odors and emissions of VOCs, ammonia, and H₂S associated with flush systems (2nd paragraph, page 62 of the Draft EA). The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment.

February EJAC Meeting - 8

The comment states that methane emissions from dairies can be reduced by using pastures and not large lagoons. Please refer to the response to comment 89-5. Using pastures and avoiding lagoons are included under the SLCP measures to reduce methane emissions at dairies. The commenter is correct. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment.

February EJAC Meeting – 9

The comment expresses concern related to biomass facilities. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA, no further response is required no changes to the Draft EA are required in response to this comment. Please see responses comments 152-7 and 152-9 for a discussion of GHG emissions from bioenergy and inclusion in the CARB's GHG Inventory and the implementation process post approval of the Scoping Plan.

February EJAC Meeting – 10

The comment expresses concern related to biomass facilities. Please see response to February EJAC Meeting 9.

February EJAC Meeting – 11

The comment expresses concerns related to a biomass facilities located in the central valley. This comment addresses existing conditions of a biomass facilities and does not address the adequacy, accuracy, or completeness of the EA. No further response can be provided.

February EJAC Meeting – 12

The comment expresses concern related to truck trips associated with biomass facilities. Please see response to February EJAC Meeting 9.

February EJAC Meeting – 13

The comment expresses concerns related to water demand and emissions from cows on pastures. The use of pastures is one of several methods discussed as options to reduce methane emissions at dairies. It would not be used where water supplies are not available. Please see response to comment 89-5 for more details regarding the Draft EA analysis of the SLCP measure, which includes regulation of diary emissions. The comment does not raise an issue related to the adequacy, accuracy, or completeness of the Draft EA and no further response is required. No changes to the Draft EA are required in response to this comment.

February EJAC Meeting – 14

The comment expresses support for pastures rather than lagoon-based manure systems are diaries. This comment is noted. Please see response to February EJAC Meeting 8.

California Air Resources Board – 2017 Scoping Plan Response to Comments

Responses to Comments

February EJAC Meeting - 15

The comment states that the Scoping Plan is not clear on what the regions would do to reduce pollution from transportation and the information provided in the Cushing Report. Please see Master Response No. 1.

The remainder of the transcript does not raise significant environmental issues related to the Draft EA. The comment letter is noted and being provided to the Board members for their consideration, but no further response to this letter is required.

Responses to Comments

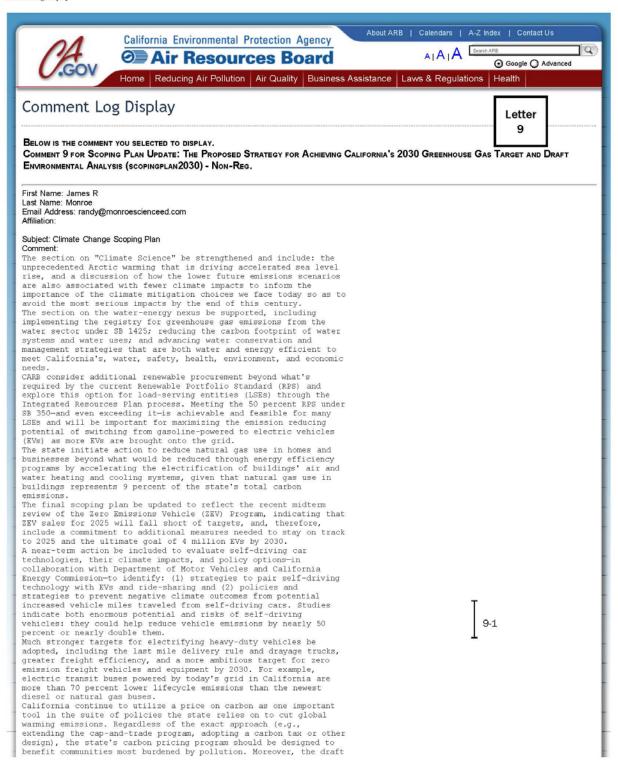
This page intentionally left blank.

ATTACHMENT A:

COMMENT LETTERS CONTAINING COMMENTS RELATED TO THE DRAFT EA

This page intentionally left blank.

Comment Log Display



https://www.arb.ca.gov/lispub/comm/bccom/disp.php?listname=scopingplan2030&comment_num=17&virt_num=9[4/18/2017 3:32:45 PM]

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A - Comment Letters

Comment Log Display

2030 Scoping Plan should reduce emissions in ways that improve public health such as the direct refinery emissions reductions, among others.

Attachment:
Original File Name:
Date and Time Comment Was Submitted: 2017-02-07 13:12:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

Back to Top | All ARB Contacts | A-Z Index

Decisions Pending and Opportunities for Public Participation

Conditions of Use | Privacy Policy | Accessibility | Bilingual Services Complaints | Civil Rights Policy

How to Request Public Records

The Board is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency.

Cal/EPA | ARB | CalRecycle | DPR | DTSC | OEHHA | SWRCB

 $https://www.arb.ca.gov/lispub/comm/bccom/disp.php?listname=scopingplan2030\&comment_num=17\&virt_num=9[4/18/2017\ 3:32:45\ PM]$

Comment Log Display



 $https://www.arb.ca.gov/lispub/comm/bccom disp.php?listname=scopingplan2030\&comment_num=21\&virt_num=13[4/18/2017\ 3:33:57\ PM]$



Letter 24

EXECUTIVE COMMITTEE

Bill Camarillo Agromin, Inc

Greg Kelley

Northern Recycling Compost

Eric Potashner Recology

Greg Pryor Recology

Will Bakx

Sonoma Compost

Christy Pestoni Abreu UVR Compost

Michael Gross Z-Best Composting

LEGISLATIVE & REGULATORY AFFAIRS

Neil Edgar, Executive Director Edgar & Associates, Inc.

Evan Edgar, Engineer Edgar & Associates

Justin Malan, Legislative Lobbyist EcoConsult

MEMBERS:

Agromin Atlas Disposal Burrtec Waste Industries Caolia Environmental California Wood Recycling CleanFleets net Clover Flat Compost Cold Canyon Compost Harvest Tulare Harvest Lathrop Marin Sanitary Service Mt. Diablo Recycling Napa Recycling Compost Northern Recycling Compost Organic Waste Solutions Phoenix Energy Quackenbush Mt. Compost Recology Blossom Valley Organics Recology Feather River Organics Recology Jepson Prairie Organics ReFuel Energy Partners Soiland Co., Inc. Sonoma Compost Tracy Delta Compost Upper Valley Recycling Vision Recycling Zanker Road Resource Management Z-Best Compost Facility Zero Waste Energy Development Zero Waste Energy, LLC

February 6, 2017

Mary Nichols, Chair California Air Resources Board 1001 "I" Street Sacramento, CA 95814

Re: Comments on the Draft Environmental Analysis for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target

Dear Ms. Nichols;

The California Compost Coalition (CCC) is a statewide organization representing operators of permitted facilities involved in the processing and composting of green and food waste materials throughout California. On behalf of these companies, we have already submitted comments on December 2, 2016 Discussion Draft of the 2030 Target Scoping Plan Update and on the December 14, 2016 meeting on the Natural & Working Lands model. CCC supported SB 32 and SB 1383 and looks forward to the joint implementation of SB 1383 by CARB and CalRecycle in the regulatory process to divert 50% of all organics from landfill by 2020, and 75% of all organics by 2025.

CCC supports the overall vision and strategy set forth in the 2017 Climate Change Scoping Plan Update and the November 2016 draft of the Short-Lived Climate Pollutant Reduction Strategy appreciate that these plans have been linked. Both of these plans need to develop a sustained funding mechanism to develop the multibillion dollar infrastructure to develop over 100 facilities and to foster the use of compost on our working lands, with a focus on irrigated croplands.

Composting and anaerobic digestion form the cement that binds the Governor's Five Pillars together. Eliminating organics from the landfills will mitigate methane generation as a short-lived climate pollutant to implement SB 1383 (Pillar 4), and instead, create biomethane power at anaerobic digestion facilities to generate more renewable energy to achieve the goals of SB 350 (Pillar 2) and carbon negative fuel for the CNG fleet that collects the organics and implements the Low Carbon Fuel Standard (Pillar 1) to displace diesel. The diverted food waste and digestate can be composted to sequester carbon and be integral to healthy soils (Pillar 5). Organic power and compost use have been deemed among the most cost-effective greenhouse gas (GHG) reduction strategies and bond all Five Pillars together. The California Legislative Analyst's Office determined the cost of composting and anaerobic digestion to be at just \$9/ton of GHG reduction while the overall average is \$57/ton.

1822 21st Street • Sacramento, CA 95811 • (916) 739-1200 • Fax: (916) 739-1216 Neil@californiacompostcoalition.org • www.californiacompostcoalition.org

Comments on the Draft Environmental Analysis for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target

Comments on Section 2 Agricultural and Forest Resources – i. Cap-and-Trade Measure

i. Cap-and-Trade Measure

Under the post-2020 Cap-and-Trade Offset Protocols, eligible offset credits would be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol and the Urban Forest Offset Protocol projects would not include activities that would be located within agriculture or forest resources, and thus could not adversely affect farmland or forest lands. Implementation of the Livestock Offset Protocol would include the operation of digesters in agricultural settings. Digesters are consistent with agricultural uses and would not represent an adverse change to agriculture or forest resources. Implementation of the U.S. Forest Offset Protocol would not increase the amount of forest activities, but could shift activities to projects that increase carbon sequestration (i.e., reforestation, avoided deforestation).. The U.S. Forest Offset Protocol does not incentivize actions that would encourage the conversion of agricultural land or forest lands (ARB 2010). Implementation of the Rice Protocol would not incentivize new rice fields on lands not currently in production, and would not adversely affect agricultural and forest resources (ARB 2014a). Implementation of landfill projects in Ontario would involve the operation of gas collection and control systems, which would not be located on agricultural or forest lands.

Compost use and biochar use on irrigated agricultural lands should be developed as a Cap-and-Trade Offset Protocol, since it is not business as usual, with only about one million acres of the nine million acres that are irrigated statewide using compost, just 11%. Compost use on irrigated cropland is not included in the Scoping Plan, and should qualify as a Cap-and-Trade Offset Protocol

CCC would like to clarify the intent of the Scoping Plan language should include compost use not be just for grasslands, but also for irrigated cropland. The following has been recommended with supportive information to increase compost use:

- Include Irrigated Cropland (compost use) in the model with a low and high management scenario of 40,000 acres per year and 80,000 acres per year
- Grasslands compost amendment (state/private) Require CalTrans and Department of General Services and other state agencies to use compost following current state law and increase by over 10,000 acres per year

Compost use on irrigated croplands is the largest current market, estimated at over 1,000,000 acres per year, and yet is not included the CALAND model despite its huge potential growth.

- Low Management
 - O Assumed 1,000,000 acres baseline in 2017
 - 500,000 acres by 2030 to get 50% of new compost produced –
 - o Add 40,000 acres each year
 - o Possible 1.5 million acres using compost 17% of all irrigated cropland
- High Management
 - O Assumed 1,000,000 acres baseline in 2017
 - $\circ~$ 1,000,000 acres by 2030 to get 100% of new compost produced –
 - Add 80,000 acres each year
 - o Possible 2.0 million acres using compost 22% of all irrigated cropland

Comments on Section 2 Agricultural and Forest Resources - Post-Mitigation Significance Determination

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this Draft EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes that, operational impacts to agriculture and forest resources associated with reasonably foreseeable compliance responses related to increased stringency of the LCFS regulation and offset protocols under the Cap-and-Trade Program under the Proposed Plan would be potentially significant and unavoidable.

24-2

Compost use on irrigated croplands is a large current market, estimated at over 1,000,000 acres per year, and yet is not included the CALAND model despite its huge potential growth, and could double by 2030, to another one million acres. The implementation of a Cap-and-Trade Offset Protocol for compost use would have a net benefit and not potentially significant and unavoidable impacts.

Comments on Section 3 Air Quality - ii. SLCP Measures

Operation of new green waste composting facilities could potentially increase VOC and PM emissions depending on the type of composting employed. These facilities could also cause other criteria pollutant emissions associated with the use of heavy equipment on-site (e.g., tractors, compost turners, and grinders) and from waste-haul truck traffic to and from the sites. Air quality impacts from the operation of digesters and associated equipment at composting facilities could potentially increase emissions. The quantity and type of emission increases would depend on the type of digester technology and the end use of the captured biogas and may include CO, PM, SOx, VOC, and NOx. Although there would be emissions associated with these sources at anaerobic digestion and composting facilities, the operation would divert organics out of landfills. As a result, there would be less mobile source at activity at landfills. Operation of digestion facilities could also help offset other emission sources by generating electricity or producing biogas as a substitute for fossil vehicle fuels.

The Environmental Analysis needs to recognize baseline conditions for organic waste management practices such as landfilling when assessing the emissions from composting and anaerobic digestion facilities. Page 62 (copied above) states that compost facilities could potentially increase VOC and PM emissions, but does not discuss the baseline conditions of these materials being landfilled, with methane and other associated landfill operations emissions. Since the SLCP measures are diverting food waste and green waste from landfilling, these baseline conditions need to be recognized where the net benefit of both greenhouse gas reductions and criteria pollutants can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities.

24-3

Some local air districts are treating new covered aerated static pile (CASP) compost facilities, using the best available control technologies as a new source, as inferred in the statement above, where the cost of permitting and offsets can stop the development of the facility. This Environmental Analysis needs to recognize the net benefit of both greenhouse gas reductions and criteria pollutants can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities.

Because the implementation details of many of the methane measures identified in the SLCP Strategy depend substantially on the design of future incentive and regulatory programs, and upon local permitting decisions, long-term air quality impacts at this point are difficult to categorize with certainty. As described above, there are methods available to implement the identified measures that may have beneficial impacts on long-term air quality through the replacement of more-polluting emissions sources and fuels. Indeed, as a statutory matter, per SB 605, SB 1383, and AB 32, along with existing Health and Safety Code mandates for criteria pollutant planning, ARB will ultimately need to develop approaches to addressing these issues that ensure that air quality goals are achieved. However, for the conservative purposes of this programmatic analysis, ARB has also disclosed implementation choices that could substantially affect air quality.

We appreciate the recognition of the beneficial impacts on long-term air quality mentioned in the statement above, but the analysis then notes there could be choices which substantially affect air quality. This Environmental Analysis needs to recognize the net reduction, with a macro analysis, that both greenhouse gas and criteria pollutants reductions can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities. Attached is a White paper by Edgar & Associates calculating that the new benefit of greenhouse gas reductions is over 14 million metric tons per year in 2025 by diverting over 13 million tons of organics from landfilling as required of SB 1383. With respect to criteria pollutants, the covered aerated static pile compost systems have been shown to reduce VOC emissions by over 80% with the use of biofilters, which should be compared to the baseline landfill system.

PRC 42649.87.b from AB 1045 states that California Environmental Protection Agency shall promote a goal of reducing at least five million metric tons of greenhouse gas emissions per year through the development and application of compost. Using the adopted emission factors, it would take 9.8 million tons of compost use to reach this requirement, diverting almost 17 million tons of organics from landfills. Calculations are provided below. This Environmental Analysis should provide the metrics and needed programs to achieve this requirement in the GHG section. Applying compost on irrigated croplands could use 7 million tons of compost by 2030, which would represent only 22% of the irrigated farmland, and Caltrans and the other state agencies should be capable of using the remainder.

PRC 42649.87.b

5,000,000 MTCO2e from compost use.

Decreased Soil Erosion

Decreased Fertilizer Use

0.26 MTCO2e/per ton compost

Decreased Herbicide Use

0 MTCO2e/per ton compost

0.51 MTCO2e/per ton compost

9,803,922 tons of compost to reach this goal

0.58 conversion from feedstock to compost

16,903,313 tons of compost feedstock

Source: https://www.arb.ca.gov/cc/waste/cerffinal.pdf pg 19

24-5

Seven million ton of more compost use by 2030:

Compost and Anaerobic Digestion as a Cost-Effective Measure

The LAO has determined that organics/recycling loans and organic composting/anaerobic digestion grants are among the most cost-effective (from \$4/ton to \$9/ton) where \$57/ton is the average and the high has been up to \$725/ton. Since December 2014, Edgar & Associates has provided similar data, utilizing a CO2 reduction supply curve to the LAO, ARB and legislators, to show that compost/AD as one of the most cost-effective GHG reduction strategies, using the "marginal cost abatement" methodology. We are happy to see the LAO validate this work. This information needs to be presented in Table III-3. Estimated 2030 Cost Per Metric Ton by Measure showing compost and anaerobic digestion as an implementing measure of SB 1383 and the Short-lived Climate Pollutant Reduction Strategy, to divert organics from landfills.

Net Zero from the Waste Sector by 2030:

The AB 32 Scoping Plan First Update was adopted on May 15, 2014 by the California Air Resource Board and includes the Net-Zero concept as copied below. Net-Zero has been defined by the California Air Resources Board as when an organization's avoided indirect emissions offset their operational emissions. By reporting the progression of operational vs avoided emissions, it is possible to demonstrate many solid waste and recycling companies have already achieved this goal.

The concept of Net Zero GHG Emission from the Waste Sector by Mid-Term was hall mark in the Fist Update in adopted in

Program	Cost Per Ton
Organics and recycling loans	\$4
orest health	4
Dairy digester research and development program	8
Organics composting/digestion grants	9
orest legacy	10
Recycling manufacturing	15
Delta and coastal wetlands restoration	30
State water and efficiency and enhancement program	33
Clean vehicle rebates	46
Sustainable agricultural lands conservation	59
Nountain meadow ecosystems restoration T \(\Lambda \)	113
Irban and community forestry	116
Vater-energy grant program LEGISLATIVE AND	LYST'S OFFICE 141
affordable housing and sustainable communities	191
Single-family solar photovoltaics ^b	209
ransit and intercity rail capital	259
Single-family energy efficiency and solar water heating ^b	282
arge multifamily energy efficiency and renewables ^b	343
inhanced fleet modernization program "plus-up"	414
ruck and bus voucher incentives	452
ncentives for public fleets pilot project for DACs	725
Overall Average	\$57

May 2014, and should be part of the 2017 Update, as we can achieve this goal much sooner with the diversion of organics from landfilling, and the use of recycled material in California manufacturing process.

Achieving Net-Zero GHG Emissions from the Waste Sector by Mid-term

Beyond 2020, additional reductions in GHG emissions from the Waste Sector will be needed to achieve a Net-Zero GHG emissions goal. To achieve these reductions, even greater diversion of organics and other recyclable commodities from landfills must be realized and further expansion and enhancement of the alternative non-disposal pathways must be developed. In addition, greater emphasis will need to be placed on reducing the volume of waste generated, recycling/reusing products at the end-of-life and remanufacturing these materials into beneficial products. To achieve Net-Zero, the direct GHG emissions from the Waste Sector would have to be fully offset by avoided GHG emissions. Avoided GHG emissions are reductions in life-cycle GHG emissions that would occur because waste is shifted from landfilling to alternative non-disposal pathways.

AB 32 Scoping Plan - First Update May 15, 2014

CCC supports the overall vision and strategy set forth in The 2017 Climate Change Scoping Plan Update and the November 2016 draft of the Short-Lived Climate Pollutant Reduction Strategy and appreciates that these plans have been linked. CCC respectfully request that CARB further evaluate our recommendations below to fully close the loop on recycling and composting with waste diversion to compost use in the one of the most recognized cost-effective GHG reduction measures available:

- Seven million more tons of compost use on irrigated croplands by 2030
- Composting and Anaerobic Digestion as most cost-effective measure
- Net Zero for the Waste Industry by 2030

Should you have any questions, please contact me at (916) 739-1200.

Sincerely,

Evan W.R. Edgar Regulatory Affairs Engineer

wan MR YSR

cc: Scott Smithline, Director, CalRecycle



Letter 41

City of Long Beach Department of Health and Human Services

Los Angeles County Department of Public Health

City of Pasadena Public Health Department

County of Riverside Department of Public Health

Santa Barbara County Public Health Department

County of San Bernardino Department of Public Health

County of San Diego Health and Human Services Agency

> Ventura County Public Health

Mary Nichols, Chairperson California Air Resources Board 1001 | Street Sacramento, CA 95814 CC: Clerk of the Board

Re: AB 32 Scoping Plan Comments

March 10, 2017

Dear Chairperson Nichols and Members of the Board,

The Public Health Alliance of Southern California is a coalition of 9 local health departments. Collectively, the members have statutory responsibility for the public health of 60% of California's population. We strive to prevent the conditions that cause poor health, well before residents must visit the doctor's office. The prestigious British medical journal, the Lancet, has identified climate change as the biggest global health threat of the $21^{\rm st}$ century". As public health professionals charged with protecting and promoting the health of the population, the Alliance is particularly committed to addressing the disproportionate health impacts of climate change on vulnerable populations.

The Alliance strongly supports the leadership that the California Air Resources Board (CARB) has taken in developing the proposed 2030 Scoping Plan. This plan represents an unmatched opportunity to protect California residents from the health impacts of Climate Change. To achieve this goal, and maximize the health benefits of the plan, we recommend that CARB:

- Evaluate the health impacts of Scoping Plan measures and scenarios in both the plan document and Environmental Impact Report, and
- Integrate clear and ambitious Vehicle Miles Traveled (VMT) Reduction targets from the SB 375 target-setting process into the Scoping Plan.

A rationale to support each recommendation is provided as follows:

Recommendation #1: Evaluate the health impacts of Scoping Plan measures and scenarios in both the plan document, and Environmental Impact Report (EIR):

We are pleased that CARB has included high-level health and equity discussions in the 2030 Scoping Plan. Although these statements provide a good general overview of the connections between health and the scoping plan, this overview does not currently analyze specific health impacts of the differing strategies and scenarios. It is also missing an analysis on the relative contributions of both health benefits and impacts as they affect population sub-groups. Because of the significance of the Scoping Plan as a guidance document, we urge you to fund an independent

41-1

p. 619.452.1180 | 619.722.3403 | www.PHASoCal.org

contractor with experience in comprehensive analysis of health impacts of programs and policies to conduct a health equity assessment of the strategies and alternatives in the Scoping Plan. This study should assess the expected magnitude and distribution of health costs and benefits for each strategy. It should include projected changes to physical and mental health resulting from the strategies proposed in the scoping plan, including land use and transportation patterns, green infrastructure, energy efficiency, building design, and air quality. It is also fundamentally important that the analysis assess the distributional impacts and benefits of strategies and scenarios in different sub-groups of California's population.

A strong, independent analysis of public health impacts of the Scoping Plan is important in fulfilling statutory requirements. AB 197 stipulates that CARB consider the social costs, including impacts to public health, of emissions reduction measures included in this scoping plan. Additionally, CEQA states that public projects that may cause substantial adverse effects on human beings, either directly or indirectly, must prepare an Environmental Analysis (EA) that discusses health and safety problems caused by the physical changes. The Scoping Plan EA should consider the full range of potential health impacts, assess the cumulative impacts of these health effects, and analyze the likely distribution of potential impacts among population sub-groups. As written, the scoping plan section on Public Health (III.C, page 76) is primarily a qualitative description, and does not provide goals and policies. As a result, the EA lacks clear health impacts in the Mandatory Findings section page 171.

41-1 cont

To fulfill AB 197 and CEQA requirements, a stronger health analysis should be included. The Alliance will be happy to serve in an advisory role, assisting CARB's contractor in identifying the parameters of these health analyses. We would also recommend that CARB routinely include a comprehensive health impact analysis on future scoping plans due to the significant reach and impact on public health. We believe this critical information will provide CARB and the public with a clearer sense of the health and equity benefits and impacts to aid in more informed decision-making.

Recommendation #2: Integrate clear and ambitious VMT Reduction targets from the SB 375 targetsetting process into the Scoping Plan.

The Scoping Plan notes that VMT reductions are necessary to achieve the 2030 target, and includes reductions in the proposed scenario. The Plan further notes that these reductions will come from stronger SB 375 targets, as well as additional strategies identified in the Appendix C: Vibrant Communities and Landscapes and Potential VMT Measures document. Prior research indicates that Greenhouse Gas (GHG) reduction strategies that replace car trips with active transportation and transit use deliver extremely strong health co-benefits. These strategies must be a key piece of California's climate change efforts.

The Scoping Plan however, does not appear to set specific targets for VMT reductions for either of these programs. We recommend that CARB set ambitious targets for both SB 375 and for Appendix C—strong enough to meet our climate goals—and clearly spell out these targets in the Scoping Plan document. Additionally, we recommend that the Scoping Plan include additional detail regarding the steps that will be necessary to meet these targets. The plan includes ambitious active transportation goals (four-fold and nine-fold increases respectively for walking and biking). We strongly support these goals, and applaud the overall direction of the strategies included in Appendix C. However, neither the Scoping Plan nor Appendix C currently provides feasible strategies to achieve these targets. Stronger policy and funding commitments with clear implementation actions are needed.

¹ Maizlish, Neil, et. Al. "Health Cobenefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the San Francisco Bay Area." American Journal of Public Health 103 (2013): 703-709.

Similar specificity is needed for SB 375 and Appendix C in the EA. The EA includes "Increased Stringency of SB 375 2035 Targets for Sustainable Communities Strategies" as a measure within the project description. However, the project description does not contain adequate detail (numerical targets) to accurately determine environmental impacts. Additionally, while the Plan relies on the strategies proposed in Appendix C to meeting GHG reduction goals, these strategies do not appear in the EIR's project description, and it is not clear whether they are included in the alternatives analysis. We encourage the many strong suggestions and strategies given in Appendices A and C to be clearly integrated into the Environmental analysis.

41-2

The Public Health Alliance of Southern California is deeply thankful for your efforts to address climate change and protect the health of California residents. We are pleased that the State has affirmed health co-benefits as a clearly stated goal of California's climate policy. As such, it is our recommendation that all plans and policy documents should analyze health cost/benefit as a matter of course, and use this analysis to inform the resulting decision-making.

Thank you for your leadership on this issue, and your consideration of our recommendations. We look forward to continued work with you to ensure a sustainable and healthy future for our state. Thank you,

Tracy Delaney, Ph.S., R.D. Executive Director, Public Health

Alliance of Southern California

tdelaney@phi.org office: 619.452.1180 direct: 619.722.3403 Selfa Saudedo, MPH
Manager, Public Health and
Behavioral Health Departments
Ventura County Health Care
Agency

Chair, Public Health Alliance of Southern California

selfa.saucedo@ventura.org office: 805.677.5231 S. Michael Johnson, MPA

Director, Public Health City of Pasadena Public Health

Department

michael.johnson@cityofpasadena.

net

office: 626.744.6166



COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE ALHAMBRA, CALIFORNIA 91803-1331 Telephone: (626) 458-5100 http://dpw.lacounty.gov Letter 52

March 30, 2017

ADDRESS ALL CORRESPONDENCE TO: P.O. BOX 1460 ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE

REFER TO FILE:

SPSO-0

Ms. Mary D. Nichols, Chair California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Dear Ms. Nichols:

COMMENTS REGARDING THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET AND DRAFT ENVIRONMENTAL ANALYSIS

Thank you for the opportunity to comment on the 2017 Climate Change Scoping Plan Update (Proposed Plan). The County of Los Angeles Department of Public Works appreciates your efforts to coordinate an inclusive stakeholder process. We believe collaborative efforts, such as these, help to identify the most economically feasible and environmentally beneficial ways to reduce greenhouse gas emissions from all sectors of our economy. Enclosed are our comments on the Proposed Plan for your consideration.

Public Works understands local governments will play an important role in achieving California's greenhouse gas reduction goals. We look forward to working with the California Air Resources Board and other State agencies as various measures and programs are developed to implement the Proposed Plan.

If you have any questions about our comments, please contact me at (626) 458-4008 or safshari@dpw.lacounty.gov.

Very truly yours,

MARK PESTRELLA
Directer of Public Works

SHARI AFSHARI Deputy Director

CS:ad

P:\spsopub\Sustainability\Public Works Sustainability Council\ARB Scoping Plan\County AB 32 Scoping Plan Ltr.docx

Enc.

COMMENTS REGARDING THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET AND DRAFT ENVIRONMENTAL ANALYSIS

The County of Los Angeles Department of Public Works' comments on the 2017 Climate Change Scoping Plan Update (Proposed Plan):

- Expand the Proposed Plan to include a more detailed discussion of specific actions the State will implement to achieve the Greenhouse Gas (GHG) reduction goals in the Proposed Plan. For example what actions will be taken to:
 - o Increase organics markets, which complement and support other sectors.
 - Resolve issues of pipeline injection and grid connection to make renewable energy projects competitive.
 - Make significant progress in Zero Emission Vehicle (ZEV) penetrations in nonlight-duty segments.
 - Promote all feasible policies to reduce Vehicle Miles Traveled (VMT).
 - Incentivize methane-capture systems at wastewater treatment plants to produce renewable electricity, transportation fuel, or pipeline biomethane.
 - Facilitate the development of alternatives to landfills, including Conversion Technologies in addition to biomass conversion and anaerobic digestion.
- Expand the Proposed Plan to include the development of Conversion Technology facilities as part of the goals for the waste management sector given their capability to handle a wide variety of wastes for which other processes, such as anaerobic digestion, composting, and recycling, may not be suitable.

Conversion technologies are a wide array of noncombustion thermal, biological, and chemical technologies capable of converting post-recycled residual solid waste into renewable energy, renewable fuels, and/or useful products. The conversion of postrecycled municipal solid waste is essential to achieve the goals identified in the Proposed Plan: such as maximizing diversion from landfills, developing a sustainable low-carbon waste management system, and mitigating climate impacts beyond 2050.

 Include a specific goal for the development of low-carbon fuels, such as biofuels, similar to the 100 percent sales goal for zero emission vehicles.

Low-carbon fuels can have an even greater greenhouse gas reduction over ZEVs because generating electricity for ZEVs creates upstream power plant emissions, whereas many biofuels can be produced with negative carbon intensity.

Page 1 of 3

 Include a goal in the waste management sector to conduct a lifecycle and costeffectiveness study of emission-reduction strategies for the solid waste sector.

This would allow the Air Resources Board to develop specific programs and policies that are most effective in reducing GHG emissions from the solid waste sector. One example would be a lifecycle comparison of different end uses of organic waste (biofuels, electricity, pipeline biogas, and compost), including carbon and water savings from different soil amendments. Another example would be the cost effectiveness of GHG reductions per ton of CO2e reduced for different organic waste-diversion strategies.

- Provide further information on the roles, responsibilities, and funding commitments expected from public agencies to support the following goals:
 - Promote transportation fuel system infrastructure for electric, fuel-cell, and other emerging clean technologies that are accessible to the public where possible.
 - Promote potential efficiency gains from automated transportation systems and identify policy priorities to maximize sustainable outcomes from automated and connected vehicles (preferably ZEVs), including VMT reduction, coordination with transit, and shared mobility.
- Provide further information on the estimated GHG reductions for the following specific transportation targets, how the targets will be achieved, and guidance on the next steps if the targets are not achieved.
 - Quadruple the proportion of trips taken by foot by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).
 - Strive for a nine-fold increase in the proportion of trips taken by bicycle by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).
 - Strive, in passenger rail hubs, for a transit mode share of between 10 percent and 50 percent and for a walk and bike mode share of between 10 percent and 15 percent.
- Include a goal or action to develop guidelines for optimizing the application of compost, similar to those developed by the California Department of Food and Agriculture for optimizing fertilizer placement.
- Include a discussion of stormwater runoff from agricultural lands, residential landscapes, and other urban spaces and its corresponding impacts to water supplies.

Page 2 of 3

Identify stormwater as a potential piece of the solution for the State to meet its GHG reduction goals from the water sector.

Stormwater is a valuable and local water resource. Meeting water sector GHG reduction goals of the Proposed Plan will be dependent on low-carbon water systems that are less energy intensive and utilize local-water supplies. Stormwater capture projects, which primarily use gravity to convey flows, provide one solution, resulting in an increased net reduction of waterrelated GHG emissions. The Proposed Plan and future versions of it should include and consider local stormwater capture as a critical part of California's water-supply portfolio.

Provide actual total energy use and GHG production values for the water sector similar to those values shown for other sectors in Figure 1-3 on page 14 of the Proposed Plan. Show how the water sector compares with the other sectors in terms of energy usage and carbon release.

· Provide a comprehensive list of available funding sources for GHG reduction projects and programs organized by sector.

CS:ad

Page 3 of 3

ucsusa.org Two Brattle Square, Cambridge, MA 02138-3780 t 617.547.5552 f 617.864.9405 Union of Concerned Scientists ucsusa.org Two Brattle Square, Cambridge, MA 02138-3780 t 617.547.5552 f 617.864.940 1825 K Street NW, Suite 800, Washington, DC 20006-1232 t 202.223.6133 f 202.223.6162 500 12th Street, Suite 340, Oakland, CA 94607-4087 t 510.843.1872 f 510.843.3785 One North LaSalle Street, Suite 1904, Chicago, IL 60602-4064 t 312.578.1750 f 312.578.1751

Letter 53

December 16, 2016

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Comments on 2030 Target Scoping Plan Update Discussion Draft

Dear Ms. Sahota,

On behalf of our 78,000 supporters in the Golden State, including 2,700 scientific experts, the Union of Concerned Scientists (UCS) is pleased to provide our comments on the 2030 Target Scoping Plan Discussion Draft (Discussion Draft) document for the 2030 Scoping Plan Update.

We thank you for the hard work and commitment of you and your staff to help design an effective, farsighted approach to the critical task of reducing greenhouse gas emissions in California, which we hope will prove to be a model for other states and beyond. We hope that our comments on the draft will be helpful as you move toward successfully finalizing the Scoping Plan.

Earlier this year, California reaffirmed its commitment to a low carbon economy with the passage of SB 32 and AB 197. Together, these bills codified the state's 2030 greenhouse gas (GHG) emissions reduction goal of 40 percent below 1990 levels, increased legislative involvement in implementation of climate change programs, and strengthened the state's commitment to ensuring climate policies help communities most impacted by air pollution. The 2030 Target Scoping Plan Update (or Scoping Plan Update) will provide the roadmap for how California will achieve this important milestone.

The 2030 target marks an important milestone on the emissions reduction pathway to limit global average temperature increases to "well below 2 degrees Celsius," a goal enshrined in the Under 2 MOU between 135 jurisdictions and adopted by more than 190 global leaders in the Paris Climate Agreement last December, including California. The Paris Agreement further committed the parties to pursuing efforts to limit the temperature increase to 1.5 degrees Celsius and achieving net-zero global warming emissions in the second half of this century.

The state is currently on track to meet its 2020 GHG reduction target under AB 32. Through its Scoping Plan Update, the Air Resources Board (ARB) has the opportunity and responsibility to build upon the success of AB 32, and present a compelling vision and plan for decarbonizing the economy in a way that supports economic growth, improves Californians' quality of life, and minimizes negative impacts on disadvantaged communities.

Review of Climate Science

We appreciate the Discussion Draft's review of the current state of climate science. It underscores the need for deep reductions in GHGs over the coming decades to avoid catastrophic climate change, and the need for serious action to increase the state's resilience to a changing climate future. However, this section of the document could be strengthened in several ways.

- The draft includes a discussion of some new climate science developments, including the fasterthan-projected rate of sea level rise. The unprecedented warming in the Arctic, which is driving this change, should also be included.
- There is a strong focus on the state's drought, which we believe is appropriate. However, it is important to accurately reflect the drought's impacts. The Discussion Draft refers to a report that estimated statewide economic costs and job losses using the SWAP model, which has been found to vastly over-estimate losses in the agricultural sector. The author retracted earlier estimates of drought impacts produced by this model and published an article with revised numbers. We recommend that ARB instead cite county crop reports on actual agricultural losses during the current drought. Finally, this section should note the profound impact of drought on the state's natural capital and ecosystems, as well communities like those in the Central Valley who lost access to drinking water supplies.
- The synthesis of the more recent literature on drought should be updated to include the conclusions of the recent Pagan et al 2016 article in *Environmental Research Letters*, which found that extreme hydrological changes are likely to lead to significant reductions in Southern California's water supply by mid-century. The lack of surface water supplies has led to increased pressure on groundwater resources, with unprecedented amounts of pumping and associated negative impacts, such as land subsidence.³ It might also be useful to add a sentence explaining that, in summary, all of these studies indicate that drought is widening the gap between water supply and water demand in California and that drought conditions are worsening.
- There are already climate change impacts affecting California that we will have to adapt to and cope with, but California and the rest of the world do have choice about how serious the impacts will be by the end of this century, as demonstrated by the graphic below. The lower emissions scenario projects a lower warming range with fewer associated impacts. This key point should be emphasized in the section of the document.

¹ Michael, Jeffrey, Richard Howitt, Josué Medellin-Azuara, and Duncan MacEwan. 2010. A Retrospective Estimate of the Economic Impacts of Reduced Water Supplies to the San Joaquin Valley in 2009. Online at: http://www.pacific.edu/Documents/school-business/BFC/SJV_Rev_Jobs_2009_092810.pdf

http://www.pacific.edu/Documents/school-business/BFC/SJV Rev Jobs 2009 092810.pdf

For example, Cooley, Heather, Kristina Donnelly, Rapichan Phurisamban, and Madyama Subramanian. 2015. Impacts of California's Ongoing Drought: Agriculture. Online at: http://pacinst.org/app/uploads/2015/08/ImpactsOnCaliforniaDrought-agrid">http://pacinst.org/app/uploads/2015/08/ImpactsOnCaliforniaDrought-agrid

Ag.pdf

3 Union of Concerned Scientists. 2015. The Big Water Supply Shift. Online at: www.ucsusa.org/watersupplyshift

2005-2034 2035-2064 2070-2099 11'F 10 10 10 9 8 Higher Finissions Scenario Scenario

Projected Average Temperatures in California

This "thermometer" graphic from the Third Assessment of the California Climate Change Center shows projected increases for three different time periods: the next several decades (2005-2034), mid-century (2035-2064), and late century (2065-2099). By mid-century, today's emissions become apparent, with differences in the higher and lower emissions scenarios occurring. By late century, projected temperatures under the higher emissions future (of up to 8.6°F above historic levels) are greater than those under the low emissions future (up to 6°F above historic levels).

Overview of the Scenarios

The Discussion Draft describes the need for significant and rapid reductions to meet the 2030 goal while also placing California on a trajectory to meet its 2050 goal of 80 percent below the 1990 emissions level. In order to achieve both goals, California will need to consider all the available emission reduction tools, including carbon pricing and specific sector-based policies, like the Renewable Portfolio Standard, Low Carbon Fuel Standard, energy efficiency standards, Zero Emission Vehicle program, and the Sustainable Freight Action Plan, among others.

UCS analysis and California's own experience show the importance of integrating sector-specific policies and a carbon price in bringing down emissions more effectively and at a lower cost. A robust price on carbon can help ensure that the costs of climate impacts and the opportunities for low-carbon energy choices are better reflected in our production and consumption choices, driving innovation in clean technologies. The revenues from a carbon pricing program can also be used for the public benefit and to amplify and accelerate climate action, as has been the case in California. Here in California, sector-specific policies in the energy and transportation sectors have been critical to overcoming market barriers and driving deployment of clean technologies and energy efficiency. In fact, we've seen sector-specific policies drive down emissions, and a price on carbon serve as a cost-effective backstop to ensure that the state reaches its GHG goals.

For the 2030 Target Scoping Plan Update, ARB is evaluating three different scenarios, each of which rely on a common core set of strategies, or "known commitments," but vary in fundamental ways. We offer some high level comments on each scenario below, with more detailed comments on specific strategies later in this letter.

Overall, UCS supports strong emission reduction measures in energy, transportation, and water among other sectors, as well as well-designed carbon pricing approaches. We look forward to additional information in the January 2030 Target Scoping Plan Update that will further describe the design details of both pricing approaches under consideration (cap-and-trade and carbon tax), as well as how effective they will be in reducing emissions and meeting other key criteria (such as addressing equity concerns and the needs of disadvantaged communities), and how they'll work in concert with complementary policies.

Draft Scoping Plan Scenario

The "Draft Scoping Plan Scenario" (Draft Scenario) relies on the known commitments plus an extension of cap-and-trade and a new refinery efficiency measure that results in 20 percent reduction in emissions at refineries by 2030. In ARB's "ideal scenario," where the known commitments and the refinery measure achieve the estimated emissions reductions, cap-and-trade would be responsible for closing the emissions gap of about 40 MMTCO2e in 2030. However, the amount of emissions reductions that cap-and-trade would need to backfill could be significantly larger if these strategies underperform. ARB's own uncertainty analysis demonstrates this possibility from a cumulative perspective in Figure III-2; cumulative GHG reductions from cap-and-trade increase from 98 MMTCO2e in the ideal scenario to 270 MMTCO2e in the uncertain scenario, or 40 percent of the reductions. (We appreciate that ARB included a discussion of uncertainty in its evaluation of the scenarios.)

UCS therefore recommends that the Draft Scoping Plan Scenario increase the amount of emission reductions attributed to sector-specific strategies beyond the levels of several known commitments and include additional sector-specific policies. They include: a stronger Low Carbon Fuel Standard and freight efficiency target, a much more ambitious target for zero emissions freight vehicles and equipment, higher levels of renewable energy investments, and a requirement for electric heat pumps in new commercial and residential buildings, among others. Including these feasible and achievable sector-specific policies will help serve as a hedge against uncertainty.

In addition, ARB should examine ways to modify the cap-and-trade program to improve outcomes in communities that are burdened by pollution and most vulnerable to its effects, in line with the direction of AB 197. Any carbon pricing program should be designed in a way that minimizes the disproportionate impacts felt by these communities. Moreover, the 2030 Target Scoping Plan Update should reduce emissions in a way that also improves public health, so we look forward to a robust analysis of the public health benefits of the January Proposed 2030 Target Scoping Plan alongside the assessment of the economic costs. We believe the proposed direct refinery reductions could be an important step in this direction.

Alternative 1

The "Alternative 1" scenario does not include carbon pricing, but rather relies on enhanced measures for the energy, transportation, and industrial sectors in addition to the known commitments. While UCS supports a robust set of sector-specific policies for achieving a significant portion of the emission reductions, we believe that a price on carbon is an important tool for the reasons described above and therefore should be considered as well.

Alternative 2

The final scenario, "Alternative 2," is a combination of known commitments, a carbon tax, and the refinery efficiency measure. As with the Draft Scenario, UCS recommends ARB increase the ambition of reductions expected from non-pricing mechanisms in this scenario by exceeding known commitments with additional sector-specific policies. These updates would help reduce the scenario's reliance on the carbon tax for emissions reductions, which could potentially be quite large as a result of the uncertainties for the sector-specific policies as shown in Figure III-2. The January Proposed 2030 Target Scoping Plan will need to discuss the specific price for a carbon tax to be evaluated properly alongside the other scenarios. We also recommend that ARB's evaluation of Alternative 2 include more detail about how a carbon tax could be designed to address some of the concerns raised in the Discussion

⁴ This does not necessarily mean increasing the RPS across the board, which would apply to all load serving entities.

Draft. For instance, ARB could explore whether a carbon tax could be designed to address concerns about emissions reduction certainty.

More detailed discussion of assumptions

In order to more fully understand staff conclusions in the Discussion Draft, UCS would also appreciate a more detailed discussion of several sets of assumptions in the January Proposed 2030 Target Scoping Plan. They include: the assumptions underlying the Reference Scenario, or business as usual, and how the models employed by ARB for the Scoping Plan development account for interactions among the sectors and specific strategies. They are important components of the Scoping Plan development and this information will enable stakeholders to more readily engage in a meaningful discussion about them. We also support an evaluation of the interactions, both synergies and trade-offs, between strategies and recommend that ARB clearly delineate what it believes would constitute a 'win-win' strategy or policy.

Known Commitments and Other Measures

The Discussion Draft includes a common set of strategies, or known commitments, across all three scenarios. They include measures from the energy and transportation sectors, as well as implementation of the Short Lived Climate Pollutant Strategy. Because the transportation, industrial, and electric power sectors combined accounted for more than three-quarters of the state's heat-trapping emissions in 2014, their share should be reflected in the selection of policies for the Scoping Plan Update. Below we provide comments on the specific known commitments described in the Discussion Draft, and highlight opportunities to strengthen specific strategies to secure additional reductions moving forward.

Energy Sector

The energy sector, which includes the state's electricity and natural gas infrastructure, represents nearly 30 percent of statewide greenhouse gas emissions in 2014. The Discussion Draft describes several existing policies and some new strategies that are critical to decarbonizing the state's energy system and meeting the 2030 goal. Below, we highlight several areas that could be strengthened or further clarified for the January Proposed 2030 Target Scoping Plan Update.

In addition, ARB should identify when in the Scoping Plan development process it will provide a range of emissions for 2030 that are associated with each sector of the economy. This information will be an important benchmark to measure emission reduction progress throughout the economy between now and 2030. It is especially important for the electricity sector, because this range of emissions forms the basis of what the IRP will plan for.

Renewable Electricity

California has made tremendous strides in renewable energy generation largely due to the successful implementation of the Renewables Portfolio Standard (RPS), which has positioned the state as a global leader in renewable energy investments. This policy has helped the state reach the GHG reductions required by AB 32 through investments in cleaner generation resources that, as an added benefit, make the electricity grid more diverse and resilient. Currently, the RPS requires all retail electricity sellers to source 33 percent of retail sales with renewables by 2020 and 50 percent by 2030. Many of the state's major electricity suppliers are well on their way to meeting these requirements. For example, Pacific Gas and Electric Company (PG&E) reports in their 2016 RPS Procurement Plan that "PG&E projects that under the 33 percent RPS by 2020 target, and an assumed 'straight-line' trajectory implementing the Senate Bill ("SB") 350 target of 50 percent RPS by 2030, it is well-positioned to meet its RPS

compliance requirements for the second (2014-2016), third (2017-2020), and fourth (2021-2024) compliance periods and will not have incremental RPS physical need until at least 2026."5

In fact, over the last four years, in-state generation capacity of renewable energy has more than doubled.⁶ Given the state's success to date in bringing new sources of renewable electricity online to displace generation by fossil fuels, UCS believes that the ARB should be open to considering additional renewable procurement beyond what's required by the current RPS. An increase in renewable electricity beyond the 50 percent identified in the draft scoping plan scenario could be possible, but would not have to be realized through an increase in the RPS, which would apply to all load-serving entities (LSEs) in the state. This is because for some LSEs, relying on renewables beyond the 50 percent RPS requirement to provide safe, reliable and cost-effective electric service while also meeting SB 32 emission reduction goals may be the best option. The integrated resource plans (IRPs) provide an opportunity to have these discussions.

Renewable energy procurement will be a key strategy to ensure that future load growth is met with carbon-free generation sources instead of natural gas. This benefit will be especially important as electricity load grows to accommodate electric vehicles. Meeting the 50 percent RPS – and even exceeding it – is achievable and feasible and will be important for maximizing the emission-reducing potential of switching from gasoline-powered vehicles to electric as more EVs are brought onto the grid.

Modeling Assumptions

We are concerned that the PATHWAYS model assumptions for expected generation from large hydropower facilities are based on historical generation data that does not reflect the impacts of climate change on the future availability of hydropower generation in California. Climate studies show that climate change will reduce California's snowpack, which will likely mean that on average, California will have less hydropower generation capacity in the spring and the summer. By failing to take this dynamic into account, the model could be overestimating the available supply of resources to meet future electricity needs.

PATHWAYS also makes certain assumptions in the Draft Scenario and alternative scenarios that allow for a greater use of GHG-free resources to integrate renewables, such as energy storage, additional participation of flexible loads including EVs, and conventional demand response. While the procurement of these resources will help reduce renewable energy curtailment, lower production costs and costs of reaching the 50 percent RPS, and reduce emissions, they have not yet been deployed aggressively enough to reduce reliance on natural gas. In addition, UCS is unsure at this point of the extent to which the CPUC's IRP process will offer an opportunity to address this issue by influencing decisions about renewable energy integration that could change how resources on the grid are dispatched. Since the utilization of these flexible, GHG-free resources is extremely important for maximizing the GHG reduction potential of the RPS and other renewable energy programs, UCS believes the 2030 Target Scoping Plan Update should emphasize the importance of making investments in energy storage

⁵ Pacific Gas and Electric Company. August 8, 2016 Draft Renewable Energy Procurement Plan (U 39 E). Online at: https://pgera.azurewebsites.net/Regulation/NewSearchResults.

⁸ California Energy Commission. California's 2030 Climate Commitment: Renewable Resources for Half of the State's Electricity by 2030. Online at: https://www.arb.ca.gov/html/fact_sheets/2030_renewables.pdf

Draft Scoping Plan Scenario & Alternatives Modeling Description, p.29

⁸ Moser, S., J. Ekstrom, and G. Franco. 2012. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California. Sacramento, CA. Page 3. Online at: http://www.energy.ca.gov/2012publications/CEC-500-2012-007/Dff

Id. pp.11-12.

and flexible load programs, enhancing coordination with neighboring balancing area authorities, and enabling renewables to provide grid services as critical to the electricity sector delivering on its emission reductions.

Building Electrification

In a 2014 analysis commissioned by ARB, CEC, CPUC, and CAISO, the consulting firm E3 evaluated the feasibility and cost of a range of 2030 targets consistent with the state's goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. They employed the PATHWAYS model, which ARB is also using for the Scoping Plan Update, and found that aggressively reducing the use of natural gas in buildings by switching to electricity was an important investment. Specifically, all of the E3 scenarios in that study assumed that over 50 percent of new sales of residential water heaters and HVAC systems for buildings were high efficiency electric heat pumps by 2030 or over 50 percent of natural gas demand was supplied with biogas by 2030. For reasons that are explained in more detail in the section below on renewable natural gas, UCS believes that to the extent the state will be able to increase the supply of renewable natural gas, while also adequately addressing methane leakage concerns, that gas should be reserved for use in the industrial sector, where efforts to dramatically reduce emissions may be more challenging than efforts to fuel-switch in commercial and residential buildings.

Given the importance of building electrification as a necessary emission reduction strategy, UCS would like ARB to provide more information on why the Draft Scenario does not include fuel-switching of natural gas or diesel end-uses to electricity either for new buildings or early retirement. ARB's Alternative 1 scenario assumes that between 2025 and 2030, residential and commercial natural gas, distillate, and LPG space heaters and air conditioners from 2013 or older are replaced with electric heat pumps at a rate of 6 percent per year. In addition, Alternative 1 assumes that between 2020 and 2035, the proportion of new residential and commercial water heater, space heater, and air conditioner sales that are electric heat pumps increases from either 0 to 75 percent or 0 to 100 percent.

In contrast, the ARB's Draft Scenario assumes no early retirement of natural gas HVAC systems, water heaters, and air conditioners and the transition to heat pumps, and that no new buildings contain electric heat pumps instead of natural gas HVAC, water heaters, and air conditioners by 2030. ARB may be assuming that some of this transition would happen as a result of the cap-and-trade program, but UCS does not believe that cap-and-trade would send an adequate incentive for building owners to switch from one technology to another. At minimum, we believe that the Draft Scenario should assume that the state enacts a requirement to encourage some new buildings (commercial and residential) to contain electric heat pumps by 2030, as it does in Alternative 1.

Renewable Natural Gas

UCS generally supports the state's efforts to displace fossil natural gas with renewable natural gas, as long as doing so contributes to an overall decrease in natural gas use statewide, and the necessary precautions are taken to address potential methane leakage issues. However, unless ARB provides some direction on where this renewable natural gas might be best used, we risk several sectors depending on the same supplies of renewable natural gas to achieve emission reductions. At this point, we believe that the most advantageous use of renewable natural gas may be in the industrial sector, where there could be fewer cost-effective alternative strategies for achieving deep cuts in emissions. UCS believes that even the state's best efforts to develop additional sources of renewable natural gas will result in a limited

¹¹ See page 10 of the Draft Scoping Plan and Alternatives Modeling Description

¹⁰ E3 Summary of scenarios, p.2: https://ethree.com/documents/E3 Project Overview 20150406.pdf

supply. 12 For this reason, we believe that directing a large portion of renewable natural gas towards residential and commercial buildings or in heavy-duty vehicle applications such as transit buses and delivery trucks, when clean electricity alternatives exist, is not the best use of what will likely be a limited supply.

Transportation Sector

As the largest sector of emissions, reducing pollution from the transportation sector is critical to addressing air quality, climate, and oil reduction goals in California. The draft scoping plan outlines several necessary steps and policies to put California on the path towards its 2030 climate targets. The following comments emphasize the importance of some of these key policies and where additional emphasis and attention is needed in order to finalize a robust Scoping Plan in 2017.

Greenhouse Gas and Zero Emission Vehicle Standards

The GHG standards for light duty vehicles play an essential role in ensuring that gasoline and diesel-powered vehicles are as efficient as possible. Because the Discussion Draft assumes that the majority of vehicles sold in 2030 will still use petroleum-based fuels, it will be critical to maintain the current fleet GHG standards through 2025. Furthermore, the evaluation of US EPA, US Department of Transportation, and CARB in the draft Technical Assessment Report supports continued efficiency improvements through 2030. The state should take actions to ensure that these technically achievable and cost-saving measures are taken.

As the Discussion Draft notes, Zero Emission Vehicle (ZEV) policies are critical to achieving the state's 2030 target. The Mobile Source Strategy calls for 1.7 million ZEV and transitional ZEVs (plug-in hybrids) in service by 2025 and 4.2 million by 2030 to meet the targets, which will require increased adoption of ZEVs. The ZEV regulation has been an important component of the state's policies to reduce air pollution, petroleum use, and GHG emissions, and the regulation serves as a floor for the minimum ZEV deployment in California. The structure of the ZEV regulation has resulted in California leading the nation in both the number of ZEVs deployed (currently more than 250,000 vehicles in California alone) and the number of ZEV models available (30 models as of December 2016). 1415

UCS supports the goals for the ZEV program as outlined in the Draft Scenario, including 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030, but the state must take additional actions beyond current policies to achieve them. While the ZEV regulation has been successful in accelerating the development and deployment of ZEVs in California, the current regulation will not result in the the anticipated effect of 15.4 percent new car sales by model year 2025. In fact, estimates of likely compliance scenarios show automakers could sell as few as 6 percent ZEVs in 2025 to meet the ZEV regulation. ¹⁶ The Discussion Draft assumes 18 percent ZEV sales in 2025 and requires 40 percent sales by 2030 with an ultimate goal of 100 percent sales – targets which UCS supports. However, more will need

National Renewable Energy Laboratory. 2013. Biogas potential in the United States. NREL/FS-6A20-6017. Golden, CO: U.S. Department of Energy. Online at: http://www.nrel.gov/docs/fy14osti/60178.pdf
 US EPA, US DOT, and CARB. 2016. Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle

Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025

thtp://www.pevcollaborative.org/sites/all/themes/pev/files/161110 PEVC PEV 250KSales Milestone Release%5B4%5D.pdf

Reichmuth, David and Don Anair. 2016. Electrifying the Vehicle Market. Online at: http://www.ucsusa.org/clean-vehicles/ev-availability#.WFOXQneZOgQ

¹⁶ Shulock, Chuck. 2016. Manufacturer Sales Under the Zero Emission Vehicle Regulation 2012 Expectations and Governors' Commitments Versus Today's Likely Outcomes. Online at: https://www.nrdc.org/sites/default/files/media-uploads/nrdc_commissioned_zev_report_july_2016_0.pdf

to be done to provide greater certainty that light duty ZEVs are on a trajectory in the near term to meet the state's climate goals. Prior to 2025, the state should implement additional policies and measures to achieve at least 15% ZEV by 2025 since this will very likely require vehicle manufacturers to substantially over-comply with the ZEV regulation. These policies should include a sustainable, reliable, and equitable incentive program, as well as increased refueling infrastructure and programs to increase consumer awareness of clean vehicle options.

Implementing ZEV requirements for model year 2026 and later vehicles is a critical policy to build on current success. But it is important that the stringency of these standards is consistent with the volume of ZEV vehicles needed by 2030 and not rely on over compliance by manufacturers to meet California's climate goals. Incentives and infrastructure investments will be important policies to complement vehicle standards, but are not a replacement for them. Setting an aggressive, yet achievable, post-2025 trajectory for ZEV requirements could also help increase ZEV sales prior to 2026 helping alleviate the disconnect between the current ZEV program requirements and the 18 percent ZEV sales fraction assumed in 2025. Setting a strong target could compel automakers to ramp up research and development prior to implementation of the 2026 standards. There is precedence for this over-compliance as large-volume manufacturers in California are currently producing many more ZEV credits than the regulation requires.

Autonomous Vehicle Technologies

The Discussion Draft, recognizing that Autonomous Vehicle (AV) technology will impact mobility options in the future, calls for action to promote the use of EVs and shared-ride services for the deployment of AV technology. It however does not commit to taking the actions that are necessary to prevent potential emission increases resulting from the deployment of AVs.

Existing literature examining the potential climate impacts of AVs shows a wide range of possible futures, from more than a doubling of emissions to a reduction of emissions on the order of 90 percent. The high-end emissions scenarios assume a large increase in VMT resulting from low-cost AV technology coupled with internal combustion engine vehicles. The ability to disengage from driving changes the value of time spent in a vehicle, which could lead to effects such as increased commute distances as housing choices change, more frequent long-distance car travel, or reduced transit use if parking and congestion are no longer a concern. AVs could also allow vehicle travel without any occupants (e.g. sending a vehicle on an errand, looking for parking, sending a vehicle back home or circling the block while waiting for its owner), adding convenience for the owner but with the potential societal cost of increased congestion and emissions.

The low emissions scenarios in the literature envision a future of shared, electric, and highly efficient (i.e. reduced weight, right-sizing, reduced congestion, platooning, etc.) AVs allowing rapid vehicle turnover and new technology dissemination in the vehicle fleet. Car ownership may decrease with the availability of ride-hailing services, car-sharing, and other transportation options enabled by AV technology, which has historically resulted in lower individual VMT as a result of paying the price for every trip rather than having the sunk cost of vehicle ownership. However, a future of electric self-driving cars operating most of the time as multi-occupant vehicles and driving down personal vehicle ownership is not a certainty.

¹⁷ Greenblatt, Jeffrey and Samveg Saxena. 2015. "Autonomous taxis could greatly reduce greenhouse-gas emissions of US light-duty vehicles," Nature Climate Change 5, 860–863. Online at: http://www.nature.com/nclimate/journal/v5/n9/full/nclimate2685.html

Wadud, Zia and Don Mackenzie and Paul Leiby. "Help or Hindurance? The travel, energy and carbon impacts of highly automated vehicles," February 2016. Online at: http://www.census.gov/prod/ec02/ec02tv-ca.pdf
Brown, Austin and Jeffrey Gonder and Brittany Repac. An Analysis of Possible Energy Impacts of Automated Vehicle. June 2014. Online at: http://link.springer.com/chapter/10.1007%2F978-3-319-05990-7_13

ARB should consider multiple possible policy levers for inclusion in the 2030 Target Scoping Plan Update that could make a low emission outcome from AV deployment more likely. These policy levers include using the extension of vehicle standards beyond 2025 to ensure that the vehicles themselves are low emissions and developing new policies designed to directly impact the use of AVs. In addition to promoting potential efficiency gains and electrification of self-driving cars, the Scoping Plan should also include a commitment to develop and implement policies that ensure that AVs do not increase climate emissions. For example, should personally owned autonomous vehicles become common, zero-occupant trips could become commonplace as noted in the example above but could be prevented with forward-looking policy.

53-1 cont

Low Carbon Fuels

The Low Carbon Fuel Standard (LCFS) is a core strategy for increasing the consumption of low-carbon, clean fuels in California's transportation sector. It is succeeding in lowering the carbon content of the state's transportation fuels.

UCS believes that the Draft Scenario's target of an 18 percent reduction for 2030 is too low. Based on the Biofuel Supply Module that ARB developed in September 2016, a target at this level would be expected to reduce credit prices from current levels and undermine investment in clean fuels.

The 2030 target should at a minimum support the continuation of the level of investment in the first phase of the LCFS. A nominally steady progression of 1% a year from 10% in 2020 to 20% in 2030 would already represent a lower level of ambition, given ongoing improvements in vehicle efficiency, expansion of alternative fuel vehicles and infrastructure, and progress in clean fuel commercialization. Thus, we believe that the LCFS target should increase to more than 20% in 2030, perhaps 22%. The final target and the schedule will require additional analysis, with a goal of supporting steady investment in progressively cleaner fuels to meet the evolving needs of the California transportation sector. We agree that absent cap-and-trade, more stringent targets for the LCFS, as well as more aggressive policies in other areas, would be required to meet the targets.

Cleaner Freight and Heavy-Duty Vehicles

UCS believes that the state can achieve stronger targets for electrifying heavy-duty vehicles than the ones described in the Discussion Draft. Battery and fuel cell technology can meet the needs of a significant fraction of heavy-duty vehicles today, particularly ones operating over short distances in cities. In California, more than 50 percent of heavy-duty vehicles have an operating range (maximum trip distance) of less than 50 miles, which is well within the range of existing heavy-duty electric vehicles on a single charge or tank of hydrogen. ¹⁸ Greater electrification and GHG reductions can be pursued under the last mile delivery rule and around drayage trucks. The latter have not been identified in the Scoping Plan as an area for achieving GHG reductions but should be included due to their suitability for electrification and existing demonstration projects within the state. The greatest reductions in emissions from heavy-duty vehicles will come from electrification. Electric transit buses powered by today's grid in California, for example, have nearly 70% lower lifecycle GHG emissions than the newest diesel and CNG

¹⁸ US Census Bureau. 2004. California 2002 economic census: Vehicle inventory and use survey. EC02TV-CA. Washington, DC. Online at; http://www.census.gov/prod/ec02/ec02tv-ca.pdf

buses. Natural gas from fossil fuel sources has limited climate benefits, having only 10% lower emissions than diesel.¹⁹

Freight equipment in particular is a critical component of the Scoping Plan because heat trapping emissions from freight are currently increasing. Likewise, as the Sustainable Freight Action Plan notes, freight equipment accounts for nearly half of statewide emissions of diesel particulate matter and nitrogen oxides, and freight hubs are a significant source of air toxics that can cause localized cancer hot spots. We believe that the included target of deploying 100,000 zero emissions freight vehicles and equipment by 2030 underestimates reasonable and necessary deployment levels. A recent ICF analysis commissioned by the California Electric Transportation Coalition found that California already has 100,000 pieces of freight equipment capable of zero emission operation and, that even under its least aggressive assumptions, the population of electric freight equipment will approach 300,000 by 2030. ARB's own Mobile Source Strategy suggests that over half of the 100,000 target would be achieved by electric forklifts. Consequently, an ambitious yet achievable target would be roughly 500,000 freight vehicles and equipment capable of zero emission operation by 2030.

The proposed freight efficiency target of 25 percent underestimates the reasonable potential for improvements in freight efficiency. In our joint comments with the California Cleaner Freight Coalition (CCFC), we previously noted that "there is no connection between this target and the GHG Reduction path that needs to be achieved by freight in order for the state to meet its 2030 and 2050 GHG reductions goals." In fact, it would result in the state increasing its GHG emissions by 10 percent between 2014 and 2030, whereas maintenance of 2014 GHG levels in 2030 would translate to a 37 percent efficiency target, according to the state's estimate of GDP growth.²¹

Finally, as noted in comments we submitted with members of the CCFC on the State Implementation Plan (SIP), many emission reductions committed to in that plan rely on "further deployment" of clean technologies. How the deployment of these technologies will occur is unclear. While incentives clearly have a role to play in meeting both the state's air quality and climate goals, coupling incentives with regulatory measures provides the best assurances that the necessary outcomes will be achieved. Because the Scoping Plan relies on many of the same actions as the SIP, the Scoping Plan must also clarify specific actions for reducing emissions beyond "further deployment."

Natural Gas and Biomethane

Biomethane (or renewable natural gas) is limited in supply with many competing demands for this resource in California. This includes businesses in the industrial sector that rely on natural gas and have few low carbon options other than biomethane. California currently uses 16,000 million diesel gallon equivalents (dge) per year of natural gas across all sectors including residential, commercial, power generation, and industrial applications, ²² yet there is an estimated biomethane potential of just 380 million diesel gallon equivalents (dge) per year in California and 2,700 million dge/year nationally. ²³ The

¹⁹ Chandler, Sara, Joel Espino, and Jimmy O'Dea. 2016. Delivering Opportunity: How Electric Buses and Trucks Can Create Jobs and Improve Public Health in California. Online at: http://www.ucsusa.org/sites/default/files/attach/2016/10/UCS-Electric-Buses-Report.pdf

²⁰ ICF International. 2014. California Transportation Electrification Assessment – Phase 1. These numbers include Class 1, 2, and 3 forklifts; transportation refrigeration units; yard tractors, cranes, and forklifts at ports; airport ground support equipment; and medium- and heavy-duty vehicles.

²¹ California Department of Transportation, California Air Resources Board, California Energy Commission, and the Governor's Office of Business and Economic Development. 2016. California Sustainable Freight Action Plan. Sacramento, CA.
²² Energy Information Administration (EIA). 2016. California Natural Gas Consumption by End Use. Online at: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm

²³ National Renewable Energy Laboratory (NREL). 2013. Biogas potential in the United States. NREL/FS-6A20-6017. Golden, CO: U.S. Department of Energy. Online at: http://www.nrel.gov/docs/fy14osti/60178.pdf

biomethane available in California would satisfy less than 15 percent of heavy-duty vehicle's demand for diesel in California today (3,000 million gallons per year), ²⁴ so its use in heavy-duty vehicles should be reserved only for vehicle applications that are not able to electrify. However, given the higher efficiency of electric vehicles, the highest value use of biomethane in the transportation sector from a carbon perspective would be to generate electricity for electric vehicles rather than using it directly in a compressed natural gas. ²⁵ Biomethane is also not immune to the climate and public health risks of methane leaks that occur throughout every stage of natural gas and biomethane transmission, storage, and distribution.

Vehicle Miles Traveled

The Discussion Draft acknowledges the important role that reducing vehicle miles traveled (VMT) growth will have in meeting California's 2030 climate target. However, despite identifying various strategies that could be explored, no commitments are made to implement specific strategies or stringency levels. SB375 in particular—the existing policy which requires regional emission reductions—is central to achieving VMT reductions at the regional level. The January 2030 Target Scoping Plan Update should contain a stronger commitment to increasing SB375 targets that is consistent with the necessary reductions in emissions and VMT to achieve the 2030 goal, as well as delivering direct benefits to disadvantaged communities. In addition to greater SB375 targets and the targets identified for biking and walking trips, targets for transit trips should also be included.

Water Sector

UCS appreciates the inclusion of the water sector in the Discussion Draft. Much of the information that is provided for this sector is, however, over a decade old. ARB should consider including newer, updated information from the California Climate Change Assessments in the January Proposed 2030 Target Scoping Plan. In particular, there is little information about the energy intensity of groundwater pumping, despite current state-funded research on the topic. For example, Lawrence Berkeley National Laboratory is currently conducting research to estimate the energy intensity of increased amounts of groundwater pumping during this drought. Our 2015 UCS report, "Clean Energy Opportunities in California's Water Sector," provides a deeper discussion of these issues.²⁶

We recommend inserting a statewide, or hydrologic region, water budget graphic into the discussion that clearly identifies data sources and gaps in our understanding of surface and groundwater water use for both urban and agricultural uses. For example, it should explain each water budget component and describe whether it is measured empirically or based on an estimate that is derived from a hydrological model. Lastly, the sentence: "agriculture uses about 40 percent of the State's managed water supply" should be removed, along with the associated footnote that defines applied water, which is not the same hydrological concept as managed supply. Managed supply is a separate term, which is not commonly-used. Rather, the typical definition, used in the California Water Action Plan, is to describe the amount of

²⁵ Chandler, Sara, Joel Espino, and Jimmy O'Dea. 2016. Delivering Opportunity: How Electric Buses and Trucks Can Create Jobs and Improve Public Health in California. Online at: http://www.ucsusa.org/sites/default/files/attach/2016/10/UCS-Electric-Buses-Report.pdf

²⁶ Christian-Smith, Juliet, Laura Wisland. 2015. Clean Energy Opportunities in California's Water Sector. Available online at http://www.ucsusa.org/sites/default/files/attach/2015/04/clean-energy-opportunities-in-california-water-sector.pdf

"developed water supply" that is consumed by different sectors (agriculture consumes 80% in California).2

Incorporating Climate Impacts into Key Assumptions and Strategies

Climate change will impact key sectors in the Scoping Plan Update, such as energy, transportation, and forestry, affecting their ability to deliver services and placing our safety, quality of life, and economy at risk.28 It could also affect a sector's ability to help achieve the 2030 and 2050 goals, especially as we look towards mid-century and beyond. For example, rising temperatures over the coming decades will increase electricity demand for cooling needs on extreme heat days while potentially decreasing the efficiency of power plants to meet that demand. It will also cause more precipitation to fall as rain versus snow, shrinking our snowpack and reducing the amount of hydropower available, especially in the warm summer months when electricity demand is higher.²⁹ Drier conditions combined with hotter temperatures could also affect the intensity and frequency of forest fires, influencing the Natural and Working Lands sector.30

The Discussion Draft acknowledges these effects by recommending a potential new measure for the transportation sector to "take into account the current and future impacts of climate change when planning, designing, operating, maintaining and investing in State infrastructure." We enthusiastically support inclusion of this measure and recommend similar strategies for other sectors in the Scoping Plan Update, as appropriate. Implementing this approach for the energy sector, for instance, will help ensure that the state is prepared to meet its energy needs over the coming decades in a manner that reduces emissions while improving the resilience of the energy system to climate impacts. Similarly, for the water sector, energy intensity of delivering water could grow if reliance on ever-deeper groundwater pumping continues unchecked.

In addition, the Scoping Plan Update should describe how modeling assumptions, such as demand or supply for the energy sector, incorporate key climate impacts that could affect the ability of these sector specific strategies to achieve their stated emission reduction goals, like extreme heat or reduced hydropower.

We also recommend that ARB list all six climate change pillars, including Safeguarding California, in the document's introduction rather than just the five GHG mitigation-related ones. The description of EO-B-30-15 in the Scoping Plan Update should be expanded to include the relevant climate adaptation provisions as well, especially the requirement for all state agency planning and investments to incorporate climate impacts.

²⁷ California Natural Resources Agency, California Department of Food and Agriculture, and Cal/EPA. 2014. California Water Action Plan. Sacramento, CA. Online at:

http://resources.ca.gov/docs/california water action plan/2014 California Water Action Plan.pdf

28 California Natural Resources Agency. 2014. Safeguarding California: Reducing Climate Risk. Sacramento, CA. Online at:

http://resources.ca.gov/docs/climate/Final Safeguarding CA Plan July 31 2014.pdf

29 Moser, S., J. Ekstrom, and G. Franco. 2012. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California. Sacramento, CA. Online at: http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf

Cleetus, Rachel and Kranti Mulik. 2014. Playing with Fire: How Climate Change and Development Patterns Are Contributing to the Soaring Coasts of Western Wildfires. Online at:

http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/playing-with-fire-report.pdf

Conclusion

California is a leader when it comes to addressing climate change, having made tremendous progress towards meeting its 2020 target. While the 2030 target is ambitious, the 2030 Target Scoping Plan Update presents an opportunity for the state to develop a compelling roadmap for a low carbon economy that supports economic growth, improves our quality of life, and minimizes negative impacts on disadvantaged communities. UCS supports a suite of strong emission reduction measures in energy, transportation, and water, among other sectors, and well-designed carbon pricing approaches to get us there, so long as they also address equity concerns and the needs of disadvantaged communities.

UCS recommends that the Draft Scoping Plan Scenario increase the level of emission reductions attributed to sector-specific strategies beyond the levels of several known commitments and include additional sector-specific policies, which we've outlined in this letter. We also suggest that the January draft of the Scoping Plan include additional detail concerning the design of both pricing approaches, as well as their costs and benefits, so that the public may better evaluate the most effective path forward to achieve California's goals of a thriving low-carbon economy, healthy and vibrant communities, and a clean environment.

Sincerely,

Jamesine Rogers Gibson

Western States Senior Climate Analyst

Adrienne Alvord

Western States Director

Jason Barbose

Western States Policy Manager

Contributing Sector Experts:

Don Anair, Clean Vehicles, Autonomous Vehicles (danair@ucsusa.org) Juliet Christian-Smith, Climate Science and Water (jchristiansmith@ucsusa.org) Michael Cohen, Energy Systems Modeling (mcohen@ucsusa.org) Jeremy Martin, Clean Fuels (imartin@ucsusa.org) Jimmy O'Dea, Sustainable Freight and Electric Vehicles (Heavy-Duty) (jodea@ucsusa.org) Dave Reichmuth, Electric Vehicles (Light-Duty) (dreichmuth@ucsusa.org) Laura Wisland, Renewable Energy (lwisland@ucsusa.org)

ucsusa.org Two Brattle Square, Cambridge, MA 02138-3780 t 617.547.5552 f 617.864.9405 Union of Concerned Scientists ucsusa.org Two Brattle Square, Cambridge, MA 02138-3780 t617.547.5552 f617.864.940 1825 K Street NW, Suite 800, Washington, DC 20006-1232 t 202.223.6133 f 202.223.6162 500 12th Street, Suite 340, Oakland, CA 94607-4087 t 510.843.1872 f 510.843.3785 One North LaSalle Street, Suite 1904, Chicago, IL 60602-4064 t 312.578.1750 f 312.578.1751

April 5, 2017

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Comments on 2030 Target Draft Scoping Plan Update

Dear Ms. Sahota,

On behalf of our 78,000 supporters in the Golden State, including 2,700 scientific experts, the Union of Concerned Scientists (UCS) is pleased to provide our comments on the 2030 Target Draft Scoping Plan Update (or Draft Plan). We previously submitted comments on the Discussion Draft for the 2030 Scoping Plan Update in December 2016. Our comments build upon that letter, and we have attached a copy for reference.

We thank you for the hard work and commitment of you and your staff to help design an effective, farsighted approach to the critical task of reducing greenhouse gas emissions in California. We appreciate that the full Draft Plan reflects some of the recommendations in our December 2016 letter, and we believe there are still ways the plan can and should be further strengthened. Our comments in this letter focus on the Proposed Scenario and sector strategies and make specific recommendations based on our review of the January 20, 2017 Scoping Plan document.

The Proposed Scenario

California will need to consider all the available emission reduction tools in order to reach its greenhouse gas emission reduction goals for 2030 and 2050, including carbon pricing and sector-based policies like the Renewable Portfolio Standard, Low Carbon Fuel Standard, energy efficiency standards, Zero Emission Vehicle program, and the Sustainable Freight Action Plan, among others. As we explained in the attached December 2016 letter, integrating sector-specific policies and a carbon price can help bring down emissions more effectively and at a lower cost.

UCS therefore agrees with the Draft Plan's approach of relying on a suite of sector-specific emission reduction policies and a post-2020 modified cap-and-trade program to achieve the state's climate goals. We, however, believe it could be strengthened in several key ways.

The "Proposed Scoping Plan Scenario" (Proposed Scenario) relies on the known commitments, defined as already underway or required, plus an extension of cap-and-trade beyond 2020 and a new refinery efficiency measure that results in 20 percent reduction in emissions at refineries by 2030. The Proposed Scenario assumes that cap-and-trade would be responsible for 191 MMTCO2e cumulatively between

2021-2030. However, the amount of emissions reductions that cap-and-trade would need to backfill could be significantly larger if the sector-specific strategies underperform (342 MMTCO2e cumulatively).

UCS recommends that the Draft Scoping Plan Proposed Scenario increase the amount of emission reductions attributed to sector-specific strategies beyond the levels of several known commitments and include additional sector-specific policies. They include: a stronger Low Carbon Fuel Standard, a much more ambitious target for zero emissions freight vehicles and equipment, higher levels of renewable energy investments, ¹ and a program that accelerates fuel switching from natural gas to electricity in residential and commercial buildings. Including these feasible and achievable sector-specific policies will help serve as a hedge against uncertainty.

In addition, the existing cap-and-trade program must be modified to improve outcomes in communities that are burdened by air pollution and most vulnerable to its effects, in line with the direction of AB 197. Any carbon pricing program should be designed in a way that minimizes the disproportionate impacts felt by these communities. On page 40, the Draft Plan lists several potential changes to the cap-and-trade program currently under evaluation by ARB (reducing the offset usage limit; redesigning the allocation strategy to reduce free allocation; reducing allocation for entities with increasing criteria or toxics emissions). We support these modifications and look forward to a robust discussion of these and other ideas as ARB amends the program post-2020 and the Legislature considers codifying an extension of cap-and-trade that will also address concerns raised by disadvantaged communities.

We also agree with the need to directly reduce emissions from refineries within California. Along with hydrogen production, they constitute the largest individual industrial source of GHG emissions, and release criteria pollutants and toxic air contaminants as well. While UCS has not conducted an independent analysis of the refinery measure, we will be interested in studying the recommendations of ARB and stakeholders on this topic and expect the specific implementation details to be more thoroughly worked out in the regulatory process.

Known Commitments and Other Measures

The Discussion Draft includes a common set of strategies, or known commitments, across the Proposed Scenario and four alternative scenarios. They include measures from the energy and transportation sectors, as well as implementation of the Short Lived Climate Pollutant Strategy. Because the transportation, industrial, and electric power sectors combined accounted for more than three-quarters of the state's heat-trapping emissions in 2014, their share should be reflected in the selection of policies for the Scoping Plan Update. Below we provide comments on the specific known commitments described in the Discussion Draft, and highlight opportunities to strengthen specific strategies to secure additional reductions moving forward.

Energy Sector

UCS is pleased to see that ARB has included efforts to evaluate the benefits of a regional energy market and encourage the development of energy storage into its *Ongoing and Proposed Measures* for the electricity sector. We highlight below several remaining areas that could be strengthened for the Final 2030 Scoping Plan. Given that the energy sector, which includes the state's electricity and natural gas infrastructure, represents nearly 30 percent of California's GHG emissions, it is critical that these strategies put the state on a path to decarbonization and quickly.

https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

¹ This does not necessarily mean increasing the RPS across the board, which would apply to all load serving entities.

Renewable Electricity

As we describe in the December 2016 letter, California has made tremendous strides in renewable energy generation largely due to the successful implementation of the Renewables Portfolio Standard (RPS). In fact, many of the state's major electricity suppliers are well on their way to meeting these requirements, and over the past four years, in-state generation capacity of renewable energy has more than doubled. UCS believes that the ARB should be open to considering additional renewable procurement beyond what's required by the current RPS if, down the road, emission reductions expected by other strategies focused on the electricity sector do not materialize. An increase in renewable electricity beyond the 50 percent identified in the Proposed Scenario is possible, and would not necessarily need to be achieved by increasing the RPS. To this end, UCS suggests that ARB modify its Ongoing and Proposed Measures for the electricity sector in the following way:

On page 90, update the current language to read "Per SB 350, increase the RPS to at least 50 percent of retail sales by 2030 and ensure grid reliability."⁴

Renewable energy procurement will be a key strategy to ensure that future load growth is met with carbon-free generation sources instead of natural gas, including additional load associated with the increased frequency of extreme heat events due to climate change. This benefit will be especially important as electricity load grows to accommodate electric vehicles. Meeting the 50 percent RPS – and even exceeding it – is achievable and feasible and will be important for maximizing the emission-reducing potential of switching from gasoline-powered vehicles to electric as more EVs are brought onto the grid.

Modeling Assumptions

The 2030 Target Scoping Plan Update should emphasize the importance of making investments in energy efficiency programs that target savings during the "evening net load ramp" timeframe, the successful deployment of flexible load programs including a transition to time-of-use rates, and enabling renewables to provide grid services as critical to the electricity sector delivering on its emission reductions. UCS therefore suggests that ARB add the following to its Ongoing and Proposed Measures for the electricity sector:

 On page 90, add the following language: "Encourage the deployment of GHG-free technologies including targeted energy efficiency, flexible load, and renewables, to provide essential grid reliability services and reduce reliance on fossil-based resources."

Building Electrification

Given the importance of building electrification as a necessary emission reduction strategy, UCS believes ARB should accelerate the strategy of reducing fossil natural gas usage in residential and commercial buildings in the Draft Scoping Plan and separate this strategy from increasing the use of renewable natural gas, or biomethane, in the residential and commercial sectors. Our rationale for the latter point is described in detail in the "Biomethane" section below. Specifically, UCS suggests that ARB move and modify the following Potential Additional Actions into the Ongoing and Proposed Measures for the electricity sector:

4 New language is in bold italic.

³ California Energy Commission. California's 2030 Climate Commitment: Renewable Resources for Half of the State's Electricity by 2030. Online at: https://www.arb.ca.gov/html/fact_sheets/2030 renewables.pdf

On page 92, update current language to read: "Decrease usage of fossil natural gas through a
combination of energy efficiency programs, and fuel switching, and the development and use of
RNG in the residential, commercial, and industrial sectors." and move to page 90.

We believe that the Final Scenario should assume that the state encourage the deployment of heat pumps, with a focus on new buildings (commercial and residential). Alternative 1 assumes that natural gas or diesel-fired space heaters and electric heat pumps from 2013 or older are replaced with electric heat pumps at a rate of 6 percent per year, and the proportion of new sales that are electric heat pumps increased from either 0 to 75 percent or 0 to 100 percent. ARB may be assuming that some of this transition would happen as a result of the cap-and-trade program, but UCS does not believe that cap-and-trade would send an adequate incentive for building owners to switch from one technology to another. At minimum, UCS suggests that ARB move the following Potential Additional Actions into the Ongoing and Proposed Measures for the electricity sector:

 Move the following language from page 92 to page 90: "Accelerate the deployment of heat pumps."

Biomethane

UCS generally supports the state's efforts to displace fossil natural gas with biomethane, or renewable natural gas, as long as doing so contributes to an overall decrease in natural gas use statewide, and the necessary precautions are taken to address potential methane leakage issues. We believe that directing a large portion of biomethane towards residential and commercial buildings or in heavy-duty vehicle applications such as transit buses and delivery trucks, when clean electricity alternatives exist, is not the best use of what will be a limited supply, and its use in heavy-duty vehicles should be reserved only for vehicle applications that are not able to electrify. The industrial sector, however, is very reliant on natural gas with few cost-effective options for decarbonization. Therefore, UCS recommends ARB explore use of this gas is in the industrial sector. The following change should be made in the Final Scoping Plan, as reflected both below and in the previous section ("Building Electrification"):

On page 92, update existing language to read: "Decrease usage of fossil natural gas through a
combination of energy efficiency programs, and fuel switching, and the development and use of
RNG in the residential, commercial, and industrial sectors."

Transportation Sector

The transportation sector is the largest sector of emissions, so efforts to reduce transportation-related pollution will be critical to addressing air quality, climate, and oil reduction goals in California. After reviewing the Draft Scoping Plan, many of our previous comments from our December 2016 letter remain regarding greenhouse gas and zero emission vehicle standards, autonomous vehicles, low carbon fuels, cleaner freight and heavy-duty vehicles, and natural gas and biomethane. We recommend ARB address them in order to ensure a robust 2030 Scoping Plan.

During the March 28, 2017 Scoping Plan workshop, ARB staff shared that their analyses showed that reductions from mobile sources were driving the greenhouse gas emissions reductions. It is therefore crucial that the Final Scoping Plan include robust policies to ensure the reductions from this sector are achieved.

Greenhouse Gas and Zero Emission Vehicle Standards

As we discussed in the attached December 2016 comment letter, the greenhouse gas (GHG) standards for light duty vehicles play an essential role in ensuring that gasoline and diesel-powered vehicles are as efficient as possible. Since the Draft Plan assumes that most vehicles sold in 2030 will still use petroleum-based fuels, it will be critical to not only maintain the current fleet GHG standards through 2025, but also be strengthened for the 2025-2030 period. UCS supports the goals for the ZEV program as outlined in the Proposed Scenario, including 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030, but the state must take additional actions beyond current policies to achieve them. We believe that, prior to 2025, the state should implement additional policies and measures to achieve at least 15% ZEV by 2025 since this will very likely require vehicle manufacturers to substantially over-comply with the ZEV regulation. These policies should include a sustainable, reliable, and equitable incentive program, as well as increased refueling infrastructure and programs to increase consumer awareness of clean vehicle options.

Implementing ZEV requirements for model year 2026 and later vehicles is a critical policy to build on current success. But it is important that the stringency of these standards is consistent with the volume of ZEV vehicles needed by 2030 and not rely on over compliance by manufacturers to meet California's climate goals. UCS therefore recommends the following updates:

- On page ES-4, modify the bullet points under "Mobile Source Strategy (Cleaner Fuels and Technology scenario) to include "Maintaining existing GHG standards through 2025 for lightand heavy-duty vehicles. Establish post-2025 Advanced Clean Car standards to put 4.2 million ZEVs on the roads."
- In table V-1 on page 137, add a bullet point under "Implement Mobile Source Strategy (Cleaner Technology and Fuels)": "Revise post-2025 Advanced Clean Car standard consistent with Mobile Source Strategy ZEV and fleet GHG targets."
- For table II-1 on page 34, designate SB350 as "known commitment" with asterisk. Use another symbol to designate items such as the Mobile Source Plan as a "planned target" or other language that reflects an explicit goal that does not yet have enabling legislation and/or regulation.

Autonomous Vehicle Technologies

While the Draft Plan promotes the use of EVs and shared-ride services for the deployment of Autonomous Vehicles (AV), it does not commit to the necessary actions for preventing potential emission increases as a result of their deployment. Existing literature examining the potential climate impacts of AVs shows a wide range of possible futures, from more than a doubling of emissions to a reduction of emissions on the order of 90 percent. We describe how AVs could increase (or decrease) emissions in the attached December 2016 letter. In order to address this concern, ARB should make the following modification in the Vibrant Communities and Landscapes/VMT Reduction Goals section:

⁵ Greenblatt, Jeffrey and Samveg Saxena. 2015. "Autonomous taxis could greatly reduce greenhouse-gas emissions of US light-duty vehicles," Nature Climate Change 5, 860–863. Online at: http://www.nature.com/nclimate/journal/v5/n9/full/nclimate2685.html

Wadud, Zia and Don Mackenzie and Paul Leiby. "Help or Hindrance? The travel, energy and carbon impacts of highly automated vehicles," February 2016. Online at: http://www.census.gov/prod/ec02/ec02tv-ca.pdf
Brown, Austin and Jeffrey Gonder and Brittany Repac. An Analysis of Possible Energy Impacts of Automated Vehicle. June 2014. Online at: http://link.springer.com/chapter/10.1007%2F978-3-319-05990-7_13

On page 102, update the high level objective to read: "Promote potential efficiency gains from
automated transportation systems and identify policy priorities to maximize sustainable
outcomes from automated and connected vehicles (preferably ZEVs), including VMT reduction,
coordination with transit, and shared mobility and discourage use of automated transportation
systems from increasing VMT, oil use, and emissions".

In addition, we believe that the Final Plan should commit to enacting a process for interagency coordination on AV policy research, development, and implementation. The Department of Motor Vehicles is already beginning to tackle questions about licensing, registration, and safe operation of AVs as companies test these vehicles on California's roads. Other state agencies, including ARB, CEC, PUC as well as regional and local transportation agencies, will be faced with additional questions related to energy use, greenhouse gas emissions, operation, equity and accessibility considerations, and other aspects of AV use as this technology comes to market, and should develop principles to maximize the benefits of this new technology. To ensure that policy development related to AVs is effective and coordinated, state agencies and local transportation decision makers will need to work together and engage the public and stakeholders. UCS therefore recommends inserting the following language into the On-Going and Proposed Measures – Vehicle Technology section:

 On page 106, add: "Implement a process for intra-state agency and regional and local transportation coordination on automated vehicles to ensure shared policy goals in achieving safe, energy efficient, and low carbon autonomous vehicle deployment."

Low Carbon Fuels

The Low Carbon Fuel Standard (LCFS) is a core strategy for increasing the consumption of low-carbon, clean fuels in California's transportation sector. The Draft Plan's target of an 18 percent reduction for 2030 is too low. Instead, the 2030 target should at a minimum support the continuation of the level of investment in the first phase of the LCFS. Thus, we believe that the LCFS target should increase to more than 20 percent in 2030, perhaps 22 percent. The following update should be made in the Ongoing and Proposed Measures – Clean Fuels section:

 On page 106, modify the language to read – "Continue LCFS activities, with increasing stringency of at least 2018 percent reduction in carbon intensity (CI)."

The final target and the schedule will require additional analysis, with a goal of supporting steady investment in progressively cleaner fuels to meet the evolving needs of the California transportation sector.

Cleaner Freight and Heavy-Duty Vehicles

UCS believes that the state can achieve stronger targets for electrifying heavy-duty vehicles than the ones described in the Draft Plan. Battery and fuel cell technology can meet the needs of a significant fraction

⁶ Union of Concerned Scientists, Maximizing the Benefits of Self-Driving Cars, February 2017. Online at: http://www.ucsusa.org/clean-vehicles/principles-self-driving-cars

UCS. Carbon Pricing and Low-Carbon Fuel Programs. January 2017. Online at:

http://www.ucsusa.org/sites/default/files/attach/2017/01/LCFS-and-carbon-pricing-programs.pdf

8 A nominally steady progression of 1% a year from 10% in 2020 to 20% in 2030 would already represent a lower level of

ambition, given ongoing improvements in vehicle efficiency, expansion of alternative fuel vehicles and infrastructure, and progress in clean fuel commercialization.

of heavy-duty vehicles today, particularly ones operating over short distances in cities. Greater electrification and GHG reductions can be pursued under the last mile delivery rule and around drayage trucks. The greatest reductions in emissions from heavy-duty vehicles will come from electrification. UCS therefore recommends including the following concept in the On-going and Proposes Measures – Vehicle Technology:

On page 106, insert "Commit to electrification drayage truck operations, with the ultimate goal
of complete electrification of the fleet."

Freight equipment in particular is a critical component of the Scoping Plan since heat trapping emissions from freight are increasing. Likewise, as the Sustainable Freight Action Plan notes, freight equipment accounts for nearly half of statewide emissions of diesel particulate matter and nitrogen oxides, and freight hubs are a significant source of air toxics that can cause localized cancer hot spots. We believe that the included target of deploying 100,000 zero emissions freight vehicles and equipment by 2030 underestimates reasonable and necessary deployment levels. The Final Scoping Plan should reflect the update below:

On page 107, modify the language to read: "Deployment of ever at least 100,000 freight vehicles
and equipment capable of zero emission operation in addition to forklift electrification, and
maximize near-zero emission freight vehicles and equipment powered by renewable energy by
2030." (This change should be reflected elsewhere in the document when this strategy is
mentioned.)

Natural Gas and Biomethane

Biomethane (or renewable natural gas) is limited in supply with many competing demands for this resource in California. This includes businesses in the industrial sector that rely on natural gas and have few low carbon options other than biomethane. The biomethane available long-term in California would satisfy just 15 percent of demand for diesel in California today, so its use in heavy-duty vehicles should be reserved only for vehicle applications that are not able to electrify, which is a decreasing fraction of the vehicle sector.

The Final Scoping Plan should include a commitment to focus any policy support for natural gas or biomethane powered vehicles in applications not conducive to electrification similar to the multi-state agency commitment made in the multi-state Sustainable Freight Action Plan for electrifying freight sources everywhere feasible and using low carbon renewable fuels everywhere else. This concept is reflected in the recommendation below.

⁹ In California, more than 50 percent of heavy-duty vehicles have an operating range (maximum trip distance) of less than 50 miles, which is well within the range of existing heavy-duty electric vehicles on a single charge or tank of hydrogen. From US Census Bureau. 2004. California 2002 economic census: Vehicle inventory and use survey. EC02TV-CA. Washington, DC. Online at; http://www.census.gov/prod/ec02/ec02tv-ca.pdf

Ochandler, Sara, Joel Espino, and Jimmy O'Dea. 2016. Delivering Opportunity: How Electric Buses and Trucks Can Create Jobs and Improve Public Health in California. Online at: http://www.ucsusa.org/sites/default/files/attach/2016/10/UCS-Electric-Buses-Report.pdf

A recent ICF analysis commissioned by the California Electric Transportation Coalition found that California already has 100,000 pieces of freight equipment capable of zero emission operation and, that even under its least aggressive assumptions, the population of electric freight equipment will approach 300,000 by 2030. From: ICF International. 2014. California Transportation Electrification Assessment – Phase 1. These numbers include Class 1, 2, and 3 forklifts; transportation refrigeration units; yard tractors, cranes, and forklifts at ports; airport ground support equipment; and medium- and heavy-duty vehicles.

 On page 103, modify the following principle under the Clean Fuels Goals to read: "Electrify the transportation sector using both electricity and hydrogen everywhere feasible and as rapidly as possible."

Water Sector

California's water sector uses significant amounts of energy and therefore has an important role in helping the state meet its climate goals. We appreciate that the Draft Plan highlights the need for better tracking the greenhouse gas emissions from this sector, and mentions SB 1425 (2016, Pavley) in particular, which establishes a voluntary greenhouse gas registry for the water-energy nexus. UCS still recommends the following sentence be updated to corrected inaccuracies:

 On page 128, edit the following sentence to read: "agriculture uses about 40 80 percent of the State's managed developed water supply" and remove the footnote that defines applied water, which is not the same hydrological concept as managed supply.

Managed supply is a separate term, which is not commonly-used. Rather, the typical definition, used in the California Water Action Plan, is to describe the amount of "developed water supply" that is consumed by different sectors (agriculture consumes 80% in California). 12

Climate Science and Incorporating Climate Impacts into Key Assumptions and Strategies

The discussion of updated climate science in the Draft Plan underscores the need for deep reductions in greenhouse gases over the coming decades to avoid catastrophic climate change, and the need for serious action to increase the state's resilience to a changing climate future. We refer ARB to our comments in our December 2016 letter for other suggestions on how to further strengthen this section.

In addition, climate change will impact key sectors in the Scoping Plan, such as energy, transportation, and forestry, affecting their ability to deliver services and placing our safety, quality of life, and economy at risk. ¹³ It could also affect a sector's ability to help achieve the 2030 and 2050 goals, especially as we look towards mid-century and beyond. For more detail on how a changing climate, from rising temperatures to changing precipitation patterns, could affect these sectors' performance, see our December 2016 letter. UCS is currently investigating how hydropower projections and the Energy Demand Forecast integrate these climate-related assumptions. We will follow up with ARB staff separately from this letter on this issue.

The Draft Plan includes updated language that describes Governor Brown's directive to state agencies to consider climate impacts in their decisions. We appreciate that ARB added language on page 2 to describe the "sixth pillar" of the Governor's strategy — which focuses on adaptation — and the requirement per EO-B-30-15 that state agencies prioritize actions that both reduce heat trapping emissions and build resilience.

¹² California Natural Resources Agency, California Department of Food and Agriculture, and Cal/EPA. 2014. California Water Action Plan. Sacramento, CA. Online at:

http://resources.ca.gov/docs/california water action plan/2014 California Water Action Plan.pdf

¹³ California Natural Resources Agency. 2014. Safeguarding California: Reducing Climate Risk. Sacramento, CA. Online at: http://resources.ca.gov/docs/climate/Final-Safeguarding-CA-Plan July 31-2014.pdf

The Final Plan should also highlight the opportunity for local governments to build climate resilience as they lower their carbon emissions. This is especially important for long-lived infrastructure (e.g., energy, transportation, water, buildings, etc.) that is being built today, which will likely face climate impacts over the next several decades that could threaten its performance and reliability. ¹⁴ Long-term plans may face a similar challenge. There are several places in the Scoping Plan where this important concept can be inserted:

- On page 27, edit the following sentence to read "Local municipal code changes, zoning changes, or policy directions that apply broadly to the community within the general plan or climate action plan can help promote the deployment of renewable, zero emission, and low carbon technologies such as zero net energy buildings, renewable fuel production facilities, and zero emission charging stations, and increase the climate resilience of communities and these investments." and "Local governments can incentivize locally generated renewable energy and infrastructure for alternative fuels and electric vehicles, implement water efficiency measures, develop waste-to-energy and waste-to-fuel projects, and preserve and enhance carbon sequestration in both rural and urban landscapes, and invest in other greenhouse gas reduction measures that also help local governments prepare for a changing climate."
- On pages 131-135, the Enabling Local Action and Climate Action Through Local Planning and Permitting should be updated to reflect the opportunity for local governments to help prepare for a changing climate through local planning, permitting and other actions to reduce heat trapping emissions, including through municipal and regional plans, local codes, climate action plans, and the planning, design, and permitting of a variety of long-lived infrastructure projects, among others.

Many solutions exist that can contribute to efforts to both mitigate and adapt to climate change, including green roofs and urban forests that reduce urban heat island effect, electricity use for cooling purposes, and storm water runoff while also absorbing carbon; distributed generation which supports grid resilience during extreme events and emits fewer greenhouse gas emissions than more centralized, fossil-fuel energy sources; and water efficiency solutions that can help a municipality prepare for a smaller future water supply while also reducing heat trapping emissions from water treatment and distribution.¹⁵

Conclusion

With recent actions at the federal level to roll back crucial efforts to reduce climate pollution, California's leadership and ambitious actions to reduce carbon emissions and accelerate a clean energy transition have never been more critical.

While we agree with the overall approach taken in the Draft Scoping Plan, UCS recommends that the Final Scoping Plan increase the level of emission reductions attributed to sector-specific strategies beyond the levels of several known commitments and include additional sector-specific policies, which we've outlined in this letter. We look forward to working with ARB staff as they finalize the Scoping Plan over the coming months, setting forth a vision for California's most effective path forward

¹⁴ Climate models project that climate impacts will likely become more severe by mid-century, so it's even more important that projects and plans that consider this timeframe integrate climate considerations. AB 2800 (Quirk, 2016) established a Climate-Safe Infrastructure Working Group of state engineers and climate scientists to identify how to best integrate climate science into state infrastructure engineering decisions, like oversight, investment, design, and construction. The Working Group will send its recommendations to the Legislature during the summer of 2018.
¹⁵ Center for Clean Air Policy, 2014. Green Resilience: Climate Adaptation + Mitigation Synergies. Washington, DC. Online at:

Center for Clean Air Policy, 2014. Green Resilience: Climate Adaptation + Mitigation Synergies. Washington, DC. Online at http://ccap.org/assets/CCAP-Green-Resilience-Climate-Adaptation-Mitigation-Synergies_April-2014.pdf

to achieve its goals of a thriving low-carbon economy, healthy and vibrant communities, and a clean environment.

Below find UCS contacts if ARB staff would like to engage in further discussion of our comments:

General

Jamesine Rogers Gibson (<u>ivrogers@ucsusa.org</u>) Adrienne Alvord (<u>aalvord@ucsusa.org</u>)

Energy

Michael Cohen, Energy Systems Modeling (<u>mcohen@ucsusa.org</u>) Laura Wisland, Renewable Energy (<u>lwisland@ucsusa.org</u>)

Transportation

Don Anair, Clean Vehicles, Autonomous Vehicles (<u>danair@ucsusa.org</u>)
Jeremy Martin, Clean Fuels (<u>imartin@ucsusa.org</u>)
Jimmy O'Dea, Sustainable Freight and Electric Vehicles (Heavy-Duty) (<u>iodea@ucsusa.org</u>)
Dave Reichmuth, Electric Vehicles (Light-Duty) (<u>dreichmuth@ucsusa.org</u>)

Climate Science & Water

Juliet Christian-Smith, Climate Science and Water (jchristiansmith@ucsusa.org)



Sent to: fcat.calfire@fire.ca.gov on Date Shown below

March 17, 2017

Forest Climate Action Team (FCAT)

RE: Comments on Draft California Forest Carbon Plan

Dear FCAT Team Members:

The following comments are submitted on behalf of the Environmental Protection Information Center ("EPIC") regarding the January 17, 2017 Public Review Draft of the California Forest Carbon Plan ("Draft Plan."). EPIC appreciates the opportunity to provide the FCAT Team with our comments and respectfully request a written response to all points raised herein.

The Forest Carbon Plan illustrates well the business-as-usual approach undertaken by the California Department of Forestry and Fire Protection ("CALFIRE") in its regulation of forest practice in California. Rather than dig in deep and effectively address the climate crisis, CALFIRE, as lead for this document, has issued nothing more than a plan for a plan. Of great concern is the lack of effective measures to regulate timber operations which ensure the net carbon sequestration we need from our forestlands. Instead, we see what we have experienced now for many years—an agency that is unwilling or unable to respond to legislative mandates and timelines, leaving our forestlands exposed to the impacts of climate change, and refusing to grapple with its role in facilitating the current unhealthy state of many of our private forestlands. The Forest Carbon Plan bears little relationship to, or understanding of, the existing regulatory and policy structure for California's private land forest management. Moreover, it does not even satisfy the directives which initiated its development. As a consequence, we are presented with a totally inadequate document, while the effects of climate change on our forestlands and their resources continue without effective action or response. Finally, the plan as written fails to reconcile the fact that much of the actions proposed in the Draft Plan are likely, at best, to lead directly back again to the unhealthy state of our forestlands that it claims to attempt to remediate.

As an organization which has spent four decades preventing harmful effects from timber operations and protecting forestlands, these comments focus on private timberlands.

I. Genesis of the Forest Carbon Plan.

Forest Carbon Plan Initiated in 2014.

The First Update to the Climate Change Scoping Plan, May 2014 ("2014 Update"),

Environmental Protection Information Center
145 G Street, Suite A, Arcata, CA 95521 I (707) 822-7711
www.wildcalifornia.org
Page 1 of 23

requires that "[q]uantitative planning targets must be set to increase net forest carbon in California in the near term, mid-term, and by 2050, while ensuring forest resilience, health, and continued ecosystem services. Forest carbon inventory and assessments should be continually maintained and refined to support this effort, and appropriate measures, funding, and incentives must also be established." (*Id.*, at 72-73.) The "[s]pecific actions to meet these planning targets for increasing carbon storage in California forests will be laid out in a 'Forest Carbon Plan' (Plan)." (*Id.*, at 73.)

According to the 2014 Update, at a minimum, the Forest Carbon Plan must:

- · Set mid-term and long-term planning targets;
- · Identify actions to meet those targets; and
- Provide recommendations on funding those actions. (Id.)

In addition, "the Plan should include a review of Forest Practice Regulations and recommendations for best management practices and potential additional regulatory measures or amendments needed to minimize GHG emissions and enhance carbon storage associated with silvicultural treatments. For example, a requirement for Sustained Yield Plans to demonstrate that activities not only maintain the current level of carbon sequestration, but actually increase carbon sequestration over the 100-year planning horizon." (Id.)

Further, the 2014 Update also provided that a working group

"will be convened to produce a report that outlines funding needs and opportunities for the Natural and Working Lands Sector as a whole. The GHG Inventory, Forest Carbon Plan, local land use planning efforts, and other statewide efforts should be considered in development of the report." (*Id.*, at 75.)

The "Forestry Sector" Working Paper, included as Appendix C in the 2014 Update, recognized:

Future climate change scenarios predict increases in temperature, increases in atmospheric CO2 concentrations, and changes in the amount and distribution of precipitation. Altering these fundamental drivers of climate can result in changes in tree growth, changes in the range and distribution of species, and alteration to disturbance regimes (e.g., wildfires, outbreaks of pests, invasive species)... [and that] [r]elatively small changes in temperature and precipitation can affect reforestation success, growth, susceptibility to pests and forest productivity." (Id., App. C, at 5, 6.)

The Forest Sector Policy Framework depended upon the creation of the "Interagency Forestry Working Group" (IFWG) "to provide recommendations and coordinate efforts for all California forest and climate change related activities to protect the state's forests." (See, www.climatechange.ca.gov/climate_action_team/forestry.html, last accessed March 6, 2017.) According to Appendix C, the IFWG was created to "address a broad range of climate change issues," with three primary tasks: (1) update the GHG inventory for the forestry sector; (2) evaluate adequacy of existing forest regulations and programs to achieve the Scoping Plan forest

Environmental Protection Information Center
145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711
www.wildcalifornia.org
Page 2 of 23

sector GHG targets, and (3) define biomass sustainability for biomass and biofuel utilization." (2014 Update, App. C. at 19.) The IFWG functioned for a short period of time, issued draft task reports, and last met in October 2010. (See, www.climatechange.ca.gov/climate_action_team/forestry/meetings/, last accessed March 6, 2017.)

B. Other Directives For The Forest Carbon Plan

1. Forest Climate Action Team

In 2014, the Natural Resources Agency in conjunction with CalEPA convened an interagency working group, called the Forest Climate Action Team, to develop the Forest Carbon Plan. (Annual Report to the Joint Legislative Budget Committee on Assembly Bill 32 (Chapter 488, Statutes of 2006) The California Global Warming Solutions Act of 2006, January 2015, at 26-27.) CNRA and CalEPA "are lead agencies for developing the Forest Carbon Plan document." (Id., at 27.)

2. Climate Change Adaptation Strategy

A component of California's efforts to address climate change is embodied in its Climate Change Adaptation Strategy. In 2016, the Natural Resources Agency moved beyond the 2014 Update finding that climate change "can" impact forests, to find that climate change is *already* impacting California forests:

"Climate change in California forests is affecting tree survival and growth, forest composition, forest health and productivity, and has increased the intensity of ecosystem disturbances from wildlife, insects and spread of invasive species and land type conversion. These impacts result in less capacity to store carbon and more risk of greenhouse gas emissions." ("Safeguarding California: Implementation Action Plans" (March 2016), Forestry Sector Plan ["Forestry Implementation Action Plan"), at 92].)

The first action proposed in the Forestry Implementation Action Plan is to "improve forest health, resiliency and co-benefits by implementing forest management practices on public and private lands." (*Id.*, at 97.). This includes "[c]oordinat[ing] efforts to reduce wildfire risks and severity to reduce associated emissions and avoid risk of landscape conversion to invasive species" and to "[m]anage the forest in such a way that increases overall carbon storage and provides multiple co-benefits such as water and biodiversity protection." (*Id.*) It also includes actions to invest in urban forestry, improve efforts for biomass utilization, implement forest management for overall health and protection of watersheds, implement priority research, and implement forest health monitoring in an adaptive management context. (*Id.*, at 97-98.)

According to this document, the "Forest Carbon Plan will provide forest carbon targets and an array of strategies to promote healthy forests that protect and enhance forest carbon and the broader range of forest environmental services for all forest in California." (*Id.*, at 99.) In addition, "[a]s part of the forest carbon plan, a Resource Economic Study will be drafted by UC

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 3 of 23 Berkeley academics. The study will evaluate several different management actions and investment choices identified in the Forest Carbon Plan." (*Id.*, at 100.)

3. 2017 Scoping Plan Update.

The 2017 Update to the Scoping Plan "sits at the center of this broad tapestry of California's other climate-oriented plans and strategies. These include, for example, ... the State's Forest Carbon Plan . . . These are designed to focus on reducing carbon pollution while also delivering targeted results and a broad range of co-benefits." ("The 2017 Climate Change Scoping Plan Update the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target," January 20, 2017 ["2017 Update"], at ES7.) The 2017 Update "was developed in close coordination with other State agency plans and regulations, including . . . the Forest Carbon Plan", (id., at 7), and "builds off of ongoing efforts to identify targets for natural and working lands, such as through the Forest Carbon Draft Plan." (Id., at 25.)

According to the 2017 Draft Scoping Plan Update: "[t]he Forest Carbon Plan will include the goal to reduce black carbon emissions from unmanaged wildfire events through forest management and restoration activities that are designed to reduce the risk of wildfire." (*Id.*, at 14, fn.28.)

The 2017 Update states that it "comprehensively addresses for the first time the greenhouse gas emissions from natural and working lands of California—including the agriculture and forestry sectors." (*Id.*, at ES1.)

The 2017 Update states that it includes "an initial analysis of business-as-usual net carbon sequestration rates from natural and working lands, including forecasts to 2030 and 2050." (*Id.*, at 1101.) However, Chapter II, which assesses alternatives scenarios against business-as-usual, does not include any estimates for natural and working lands, because "work is still underway on how to quantify the GHG emissions within the natural and working lands sector." (*Id.*, at 31.) More projections need to be developed, which "will be used to estimate the difference between current carbon sequestration levels and expected sequestration levels in the scenarios to achieve the net zero loss goal by 2030 and net sequestration goal by 2050." (*Id.*, at 110.)

Thus, despite its claims, the 2017 Draft Scoping Plan Update does not "comprehensively address for the first time the greenhouse emissions from natural and working lands in California." (*Id.*, at ES1.) At most, it recognizes that more work is needed to understand carbon sequestration in natural and working lands, dependent on future modeling and projections (1) to "help guide near and long-term State policies to ensure net sequestration in our natural and working lands," (2) to be refined over time, which "will be important to support implementation planning and to model implementation scenarios to 2100 to better understand the response of natural and working lands to major climate change impacts such as increased temperature, drought, and wildfire," and (3) the results of which "may also inform the accounting framework requirements set forth in SB 859." (*Id.*). Indeed, according to the 2017 Draft Scoping Plan Update: "Future work will identify and seek to fill gaps, and set a comprehensive and strategic path forward." (*Id.*, at 111.)

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 4 of 23 Thus, another future plan is proposed: by 2018, the "state will complete an Integrated Natural and Working Lands Climate Change Action Plan" intended to "ensure the natural and working lands sector is a net carbon sink." (*Id.*, at 115.) It is not clear if the Forest Carbon Plan may be included in this "Action Plan." (*Id.*) As part of Scoping and Tracking Progress, the Forest Carbon Plan will be completed and implemented by some date in the future, although it is not stated how or when it will be completed and implemented. (*Id.*, at 118; Discussion Draft 2030 Target Scoping Plan Update, December 2, 2016, at 67.)

II. Summary Critique of the Draft Forest Carbon Plan.

The January 17, 2017 Public Review Draft of the Draft Forest Carbon Plan ("Draft Plan") is yet another example of a "plan for a plan," which mimics a *laissez faire* approach maintained by CAL FIRE and its Board of Forestry ("Board") with respect to climate change and its impacts on forest lands. It is more than disappointing, for example, that after more than six years, we still have no assurance from the Board that the rules and regulations which govern private land forest practices provide for adequate carbon sequestration to meet our state mandates. (Pub. Res. Code § 4551(b)(1).) To CAL FIRE and its Board, it seems as though climate change remains a future concern, rather than an imperative to take effective action. The Draft Plan is another illustration of lack of care, as it has no effective action to undertake efforts to deal with the impacts of climate change on our forestlands. To the extent its main emphasis is on "management," or "treatments," through "thinning," with utilization of biomass for non-urban forests, the Draft Plan fails to appreciate the need for action to protect and preserve our forestlands. While it gives attention to the need for large old trees, and land conservation, it provides no effective scheme to ensure these outcomes. It is long on ideas, and short on action.

A peer review of the Draft Plan conducted for Ebbetts Pass Forest Watch by Oregon State University Assistant Professor, Dr. John L. Campbell, provides the following summary of the review results, echoing our sentiments:

"The CFCP advocates for increased logging and prescribed burning on public forest land and a continuation of business-as-usual logging on commercial forests. A case is made that both these actions result in favorable ecological, economic and social outcomes and that under this management regime state-wide forest carbon stocks will, in future decades, aggrade to levels higher than they are today. While the arguments in favor of forest restoration are generally defendable, the actions proposed by the CFCP rely almost entirely on a single dogmatic narrative of improved forest health through harvest without acknowledging the roll natural disturbance can play in maintaining healthy forest function or the easy carbon savings that would result from increasing rotation lengths on lands managed for timber production." (Campbell CFCP Peer Review, at 1, copy attached.)

The Draft Plan is at best incomplete and needs to be rewritten to be ready for public consumption. This comment letter addresses specific issues which underscore this lack of commitment to effectively deal with climate change impacts.

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 5 of 23 though it is intended to exist in a vacuum.

To start, Draft Plan lacks stated authority. The directives discussed above, as well as the Draft Plan itself, fail to identify the authority and implementation of the proposed Forest Carbon Plan. It is not clear, nor stated, under what authority and what agency or agencies review comments on the Draft Plan, and/or propose to take action on any decision about the Forest Carbon Plan. There is no clarity as to what status the Forest Carbon Plan has or will have in the existing regulatory structure for California's forest regulation, much less its roles in California's multi-faceted effort to deal with climate change. Nor are any protocols or standards provided to assess the Forest Carbon Plan.

The Draft Plan fails to satisfy the directives as set forth above. Moreover, it lacks any core reference to and understanding of the existing Forest Practice Act and the Forest and Rangeland Resources Assessment and Policy Act. These two statutory schemes provide the existing regulatory structure for commercial private land timber operations in California and the mechanism to ensure an ongoing and regular understanding our of forestlands and their resources. Forest practices in California depend on these statutes, and the Draft Plan largely ignores their existence and what role they could and should play in implementing the Plan. Nor is the Draft Plan accompanied by a required analysis under the California Environmental Quality Act ("CEQA").

Further, instead of meeting directives and existing in the context of our existing regulatory schemes, the Draft Plan relies on many assumptions, has no real action, and fails to reckon with how the use of offsets by timber industry can adversely affect reduction of GHG emissions and increased carbon sequestration. The Draft Plan is construed in such a way as

III. The Forest Carbon Plan Lacks Statement of Authority and Protocols.

The public is asked to comment on a document which has no clear status. While conceived in the 2014 Update, it is unclear from that document or otherwise if the Forest Carbon Plan is a stand-alone regulatory tool, a part of the 2017 Scoping Plan Update, or some other kind of document. Nothing in the Draft Plan instructs as to its review protocols, adoption, and/or use by one or more agencies, or otherwise.

The Draft Plan itself starts by stating that it is the "detailed implementation plan for the forest carbon goals embodied in the 2030 Target Scoping Plan Update." (Draft Plan, at 1.) However, the 2017 Draft Scoping Plan Update makes no mention of the Forest Carbon Plan. Nor is there any mention of it in the accompanying Appendix F - Environmental Assessment, as part of the 'Project Description,' or elsewhere in the 2017 Draft Scoping Plan Update.

As noted above, the Draft Plan is listed as one effort which may be included in an as-yet-to-be-developed "Natural and Working Lands Climate Change Action Plan." (2017 Update, at 115.) The 2017 Update 'Scoping and Tracking Progress' lists the item "Complete and implement the Forest Carbon Plan," but it is not clear that this is one of the "many" efforts to be included in this future Action Plan. Nor does the 2017 Draft Scoping Plan Update identify what agency and when that progress effort may occur. (*Id.*, at 118.)

57-1

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org

Page 6 of 23

As such, the opportunity for public comment on the Draft Plan is stymied, with no framework against which it can be assessed. Because no authority or protocols are identified and no framework given as to how the Draft Plan relates to existing statutory and regulatory laws governing California forest practices, we are left with the guidance as provided by statements in the 2014 Scoping Plan Update, the 2016 Forestry Implementation Action Plan, and the 2017 Draft Scoping Plan Update. In the absence of any clarity as to the authority and protocols by which public comments may be reviewed and responded to, and the Forest Carbon Plan may be acted upon, we object to, and challenge the manner and substance by which the Draft Plan has been issued and proposed for public review.

IV. The Forest Carbon Plan Does Not Satisfy the Directives Given.

The only guidance as to what is to be included in the Draft Plan is provided by the three references identified above. From these, we identify six specific requirements:

- 1) Set mid-term and long-term planning targets for increasing carbon storage in California forests;
- 2) Identify specific actions to meet those targets;
- 3) Provide recommendations on funding those actions;
- 4) Should review the Forest Practice Regulations and recommendations for best management practices and potential additional regulatory measures or amendments needed to minimize GHG emissions and enhance carbon storage associated with silvicultural treatments, such as a requirement for Sustained Yield Plans to demonstrate that activities not only maintain the current level of carbon sequestration, but actually increase carbon sequestration over the 100-year planning horizon (2014 Update, at 73);
- A Resource Economic Study, which will evaluate several different management actions and investment choices identified in the Forest Carbon Plan" (Forestry Implementation Action Plan, at 100); and;
- 6) Include the goal to reduce black carbon emissions from unmanaged wildfire events through forest management and restoration activities that are designed to reduce the risk of wildfire" (2017 Update, at 14, fn 28).

The Draft Plan pays lip service to the requirement for targets, actions, and recommendations for funding; however, upon close review and as highlighted below, these don't come close to constituting a "detailed implementation plan for the forest carbon goals" in the 2017 Draft Scoping Plan Update.

For example, while it claims a "number of quantitative targets are included in this Draft Plan," (Draft Plan, at 24), this is the only time one finds the term, "quantitative targets." There is no clear path presented as to what are those "quantitative targets." And, to the extent the "goals" articulated in Chapter 3 are intended to provide these targets, they lack effective strategy to enable the specific actions required by the 2014 Scoping Plan Update.

Another example is found in the stated target for non-federal forest lands: to "ensure that timber operations conducted under the [Act] and Rules contribute to the achievement of healthy and resilient forests that are net sinks of carbon." (*Id.*, at 30.) We note this is a driving force of

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 7 of 23 the Forest Practice Act, and the Board duty pursuant to AB 1504, which is ignored here, yet with no statement as to how this will occur. AB 1504 was chaptered in 2010, and there has not been any real effort on the part of the Board of Forestry to meet the mandates imparted by the Legislature to-date. At present, there is still nothing in the Forest Practice Rules enacted by the Board that would ensure reductions in GHG emissions from forestry-related activities, or ensure added carbon dioxide storage beyond the status-quo. The Draft Plan perpetuates the failure of the Board by completely failing to include an evaluation of extant Forest Practice Rules, as required by AB 1504.

The Draft Plan does not include a review of the Forest Practice Rules, or any recommendations for best management practices and additional regulatory amendments needed to minimize GHG emissions and enhance carbon storage with silvicultural treatments. Nor does the Draft Plan provide a "resource economic study." And, the Draft Plan explicitly states that "neither this plan, nor the draft Short-Lived Climate Pollutant Reduction Strategy (November 2016), includes an explicit, numerical emission reduction target for wildfire black carbon emissions." (Draft Plan, at 30.)

V. The Forest Carbon Plan Fails to Recognize the Governance and Duties Under Existing Statutes.

The Draft Plan effectively ignores California's regulatory structure governing private land forest practice, and the state's forest research program intended to inform policy and regulatory changes. Notably, the Draft Plan all but ignores and lacks recognition of core principles in the California's Z'Berg Nejedly Forest Practice Act ("Act"), Public Resources Code § 4511 et seq., the law which regulates private land commercial forestry operations. This law governs how logging is done, and what standards apply—all of which is key to developing a statewide plan to ensure net carbon sequestration from these forests. As mentioned above, the Draft Plan did not bother do provide a review of the existing regulations under the Act, or make recommendations. In addition, the Draft Plan fails to require information through the Forest and Rangeland Resources Assessment and Policy Act ("FRAP"), which is administered by CAL FIRE. Finally, the Draft Plan fails to comply with the California Environmental Quality Act ("CEQA"), lacking any analysis or determination under CEQA.

We provide here an overview of these statutory schemes to illustrate how they must be utilized and complied with in the development of any Forest Carbon Plan intended to provide an effective strategy to reduce GHG emissions and ensure net carbon sequestration in our forests.

A. The Z'Berg Nejedly Forest Practice Act.

When the Legislature created the Act in 1973, it recognized that "the forest resources and timberlands of the state are among the most valuable of the natural resources of the state and that there is great concern throughout the state relating to their utilization, restoration, and protection." (Pub. Res. Code § 4512(a).) California's policy is "to encourage prudent and responsible forest resource management calculated to serve the public's need for timber and other forest products, while giving consideration to the public's need for watershed protection, fisheries and wildlife, sequestration of carbon dioxide, and recreational opportunities alike in this

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 8 of 23 and future generations."(Id. § 4512(c), Emphasis added.).1

The Act is intended "to create and maintain an effective and comprehensive system of regulation and use of all timberlands so as to *ensure* both of the following:

(a) Where feasible, the productivity of timberlands is restored, enhanced, and maintained. (b) The goal of maximum sustained production of high-quality timber products is achieved while giving consideration to values relating to sequestration of carbon dioxide, recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment. (Id. § 4513.)

The Board has a duty to ensure that our forest resources are protected, by among other things, adopting regulations which are regularly reviewed and revised in order to ensure that the "comprehensive system" envisioned by Section 4513. The Board, as part of CALFIRE, "shall represent the state's interest in . . . the protection of the state's interests in forest resources_on private lands, and shall determine, establish, and maintain an adequate forest policy. General policies for guidance of the department shall be determined by the board." (Id. §§ 730(a), 740.)

The Act requires the Board to adopt rules consistent with the following three policies:

- (1) "The board shall adopt district forest practice rules and regulations for each district in accordance with the policies set forth in Article 1 (commencing with Section 4511)... to ensure the continuous growing and harvesting of commercial forest tree species and to protect the soil, air, fish and wildlife, and water resources, including, but not limited to, streams lakes and estuaries." (*Id.* § 4551.)
- (2) "The rules and regulations adopted by the board shall be based upon a study of the factors that significantly affect the present and future condition of timberlands and shall be used as standards by persons preparing timber harvesting plans." (*Id.* § 4552.)
- (3) "The rules and regulations shall be continuously reviewed and may be revised. During the formulation or revision of the rules and regulations, the board shall consult with, and carefully evaluate the recommendations of, the department, concerned federal, state, and local agencies, educational institutions, civic and public interest organizations, and private organizations and individuals." (*Id.* § 4553.)

To the extent the Board intends for CAL FIRE to exercise its professional judgment in applying any rules, the Board must provide "standards to guide the actions of director, and the director shall conform to such standards." (*Id.* § 4552.) The rules developed by the Board are known as the Forest Practice Rules or Rules, and are codified at 14 Cal. Code Regs. § 895 et seq.

JADVANCE \u 31 While giving consideration to" means the rules and regulations "must provide for protection" of these resources and values. (See 58 Atty.Gen.Opn. 250 (1975).)

Environmental Protection Information Center
145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711
www.wildcalifornia.org
Page 9 of 23

1. Key Forest Practice Act Provisions

At least two provisions of the Act are relevant to the issues presented by climate change: (1) the goal of "maximum sustained production of high quality timber products," and (2) the duty to ensure carbon sequestration.

First, the goal of "maximum sustained production of high quality timber products" (MSP) is "perhaps the core concept of the Forest Practice Act..." (EPIC v. California Department of Forestry and Fire Protection, 44 Cal.4th at 476, fn. 4, emphasis in original.) Indeed, the "the Forest Practice Act imposes a duty on the Board of Forestry to adopt and enforce regulations which, in a manner left to the discretion of the Board, limit the aggregate harvest of timber on private timberlands in relation to the present and anticipated future supply of standing timber." (Redwood Coast Watersheds Association v. State Board of Forestry and Fire Protection (1999) 70 Cal.App.4th 962, 970, emphasis added.)

Second, in 2010, the Legislature required forest resource management to protect the public's need for "sequestration of carbon dioxide." (Stats. 2010, c. 534 (A.B. 1504), § 1, codified as Pub. Res. Code § 4512(c).) At that time, the Legislature added a new section to the Act, finding that our "[s]tate forests play a critical and unique role in the state's carbon balance by sequestering carbon dioxide from the atmosphere and storing it long term as carbon," and that among other things, "[t]here is increasing evidence that climate change has and will continue to stress forest ecosystems, which underscores the importance of proactively managing forests so that they can adapt to these stressors and remain a net sequester of carbon dioxide." (Id., § 2; amended by Stats. 2011, c. 296 (AB 1023), § 256, codified as Pub. Res. Code § 4512.5 (a), (d).) The Legislature instructed that "[t]he Board, the Department, and the State Air Resources Board should strive to go beyond the status quo sequestration rate and ensure that their policies and regulations reflect the unique role forests play in combating climate change." (Id. subd. (e).)

Also in 2010, the Legislature required the Board to:

"[E]nsure that its rules and regulations that govern the harvesting of commercial tree species, where applicable, consider the capacity of forest resources, including above ground and below ground biomass and soil, to sequester carbon dioxide emissions sufficient to meet or exceed the state's greenhouse gas reduction requirements for the forestry sector, consistent with the scoping plan adopted by the State Air Resources Board pursuant to the California Global Warming Solutions Act of 2006 (Division 25.5 (commencing with Section 38500) of the Health and Safety Code)." (Stats. 2010, c. 534 (AB 1504), § 4, codified as Pub. Res. Code § 4551(b).)

According to the 2014 Update, the "Board of Forestry has been evaluating the adequacy of existing forest regulations and programs for achieving GHG emission reductions and ensuring carbon sequestration on forest lands." (2014 Update, at 70.) To date however, the Board has not provided this assurance. The 2014 Update also refers to the duty under AB 1492 (2012) to "evaluate ecological performance measures, which are likely to include an evaluation of practices that may directly or indirectly affect GHG emissions." (*Id.*, at 71.) To date, that

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 10 of 23 evaluation has not occurred. According to the most recent AB 1492 annual report to the Legislature, "[a]s discussed in previous Annual Reports, developing ecological performance measures for management outcomes on the State's nonfederal timberlands is a challenging task that will take significant effort and some time to accomplish." (Assembly Bill 1492 Annual Report to the Joint Legislative Budget Committee on the Timber Regulation and Forest Restoration Program, February 8, 2016, at 20.) According to this report, the "state review team agencies are early in the process to develop new ecological performance measures per the requirements of AB 1492." (Id.)

2. Regulations Intended to Implement the Act

The Board has adopted an extensive set of regulations governing the timber harvest plan ("THP") process, which are intended to:

"[I]mplement the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 in a manner consistent with other laws, including but not limited to, the Timberland Productivity Act of 1982, the California Environmental Quality Act (CEQA) of 1970, the Porter Cologne Water Quality Act, and the California Endangered Species Act. The provisions of these rules shall be followed by Registered Professional Foresters (RPFs) in preparing Timber Harvesting Plans, and by the Director in reviewing such plans to achieve the policies described in Sections 4512, 4513, of the Act, 21000, 21001, and 21002 of the Public Resources Code (PRC), and Sections 51101, 51102 and 51115.1 of the Government Code." (14 Cal. Code Regs. § 896(a).)

These include regulations intended to fulfill the central requirement to ensure the goal of "maximum sustained production of high quality timber products." The Board has not, however, promulgated regulations concerning climate change, carbon emissions, or carbon sequestration.

a. Regulations Intended to Fulfill MSP

The Board's "silvicultural" rules are intended to implement the requirement for MSP, as they "provide for alternatives that when applied shall meet the objectives of the FPA (PRC 4512 and 4513)." (14 Cal. Code Regs. § 913.3.) These rules require that the registered professional forester ("RPF") "select systems and alternatives which achieve maximum sustained production of high quality timber products." (*Id.*) While CAL FIRE must deny a THP if it fails to achieve MSP, Rules, *see*, 14 Cal. Code Regs. § 898.2(g), the Rules do not define "maximum sustained production" ("MSP"), or require a specific process to show how or if MSP is attained. Rather, they provide three voluntary options to "achieve" MSP.

These options are set forth in Rules section 913.11, the goal of which is to achieve MSP "by meeting the requirements of either (a) or (b) or (c) in a THP, SYP or NTMP, or as otherwise provided in Article 6.8, Subchapter 7 [PTEIR]." Of the three options, only one, subsection (b), develops a "plan,"—the "Sustained Yield Plan." The Board has adopted a separate set of rules as to SYP contents, process of review, monitoring, and renewal. (See, 14 Cal. Code Regs. § 1091.1 et seq.) "A THP which relies upon and is found to be consistent with an approved SYP shall be

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 11 of 23 deemed adequate to achieve MSP." (See, 14 Cal. Code Regs. § 913.11(b)(4).)

The other two options—subsections (a) and (c)—require information to be presented in each THP, and have no similar language permitting ongoing reliance as with the SYP. These two options are distinguished by the timberland owner's acreage: Option-(a) is available for landowners with an acreage above 50,000 acres; Option-(c) is available for landowners with less than 50,000 acres. Additionally, Option-(c) may be used by a timberland ownership of more than 50,000 acres if an SYP or demonstration of achievement of MSP under Option-(a) "has been filed with the department and has not been returned unfiled or approved," and "[f]or scattered parcels on timberland ownerships of 50,000 acres or more." (See, 14 Cal. Code Regs. § 913.11(c).)

There is no requirement in any of these options to demonstrate anything about carbon sequestration.

b. No Regulations to Ensure Carbon Sequestration

While in 2010 the Legislature identified the requirement for forest resource management to protect the public's need for carbon sequestration, *see*, Pub. Res. Code §§ 4512, 4513, and directed the Board to ensure that its regulations provide for carbon sequestration, *id.*,§ 4551(b), to date the Board has not adopted any regulations, or amended existing regulations, to ensure carbon sequestration, or to provide standards and guidance to calculate and assess and greenhouse gas emissions and carbon storage. CAL FIRE developed a "Greenhouse Emissions Calculator, ("GHG Calculator"), which has not been adopted as a rule or a technical rule addendum by the Board. A download of the Excel file is available at http://bit.ly/2j57Jfg, and a "User Guide" for the GHG Calculator is available at http://bit.ly/2j8u4Ls.

The CAL FIRE GHG Calculator itself has been the subject of considerable objection and scrutiny. For example, in a letter submitted to the Air Resources Control Board regarding development of forestry protocols for GHG emissions reduction, Professor Mark Harmon of Oregon State University stated:

"I have major concerns about this carbon calculator. First, I believe I have found some specific errors in the programming. But secondly, and most importantly I believe that the entire basis of this calculator is flawed. It is flawed because it fails to address the fundamental dynamic of any forest carbon system. It does this by ignoring the dynamics of the dead and soil carbon. In doing so it creates artificial carbon sinks. Ignoring what is happening in the dead and soil carbon is simply not following the best science available of 20 years ago let alone today. I also found the losses assumed for site preparation completely unrealistic and far too low. The calculator ignores the initial starting point of wood products stores. On some lands perhaps there were no previous harvests. But on land on which there were harvests, then it is scientifically invalid to not account for these existing wood products stores." (Harmon 2010, Letter to California Air Resources Control Board, copy attached.)

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org

Page 12 of 23

CAL FIRE's Board has not provided, pursuant to Pub. Res. Code § 4552, any guidance or standards to permit CAL FIRE to exercise its professional judgment in determining that harvesting of timber ensures carbon sequestration. (See, Id., § 4551(b).)

Thus, to the extent the Draft Plan disregards the Act, it fails to satisfy the directive from the 2014 Update, which expressly stated that the Draft Plan:

"[S]hould include a review of Forest Practice Regulations and recommendations for best management practices and potential additional regulatory measures or amendments needed to minimize GHG emissions and enhance carbon storage associated with silvicultural treatments. For example, a requirement for Sustained Yield Plans to demonstrate that activities not only maintain the current level of carbon sequestration, but actually increase carbon sequestration over the 100-year planning horizon." (2014 Update, at 73.)

The Draft Plan provides no such review. Rather, the Draft Plan seems to largely avoid the statutory requirements of the Act, and that the Forest Practice Act and Rules exist at all.

The Forest Carbon Plan Fails to Reckon with The Act and Its Administration by CAL FIRE.

According to the Draft Plan, California's forests remain unhealthy and overcrowded. (Draft Plan, at 16.) The Draft Plan refers to the "current unhealthy state of forests." (*Id.*, at 18.) and scientists are concluding that California forests as they currently are will not be successful in absorbing those changes (from climate change impacts drought and temperature) as they once did. (*Id.*, at 53.) And on private corporate timberlands, there is "slightly" more growth than removal, with "less carbon stored per acre in live tree inventories, as they don't get as old and large as trees on public landscapes, but mortality is much lower." (*Id.*, at 74.) These statements suggest that CAL FIRE's management and regulation of the Act is not meeting the intent of the Act. Yet, the Draft Plan provides no discussion as to what role the Act should assume in assuring the carbon sequestration desired.

The Draft Plan states that "[f]inding policy solutions that encourage sustainable management and use of California's forestlands and wood products to reduce business and emissions leakage while ensuring decreasing carbon footprint is a critical consideration." (*Id.*, at 103.) We believe the Act already includes this directive, particularly through the mandate to ensure MSP. Unfortunately, as borne out by above statements, CAL FIRE and its Board are doing nothing to ensure this. We need enforcement and metrics, not policy wonk as provided in the Draft Plan. The Draft Plan needs to explicitly explain how this directive is achieved, given the CAL FIRE's role and deficient administration of the Act and current forest conditions.

The Draft Plan refers to most forests in western United States as "fire prone." (*Id.*, at 47.) THP regulations do not require any analysis of how the silviculture prescriptions to be used in any specific logging plan may contribute to fire-prone conditions. This is a clear oversight in the Act, yet the Draft Plan ignores the need to deal with this key problem for private timberlands. Instead, it merely assumes that fire prone forest can be remedied with "treatments," as though

Environmental Protection Information Center
145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711
www.wildcalifornia.org
Page 13 of 23

analysis of silvicultural methods is irrelevant. It is remarkable, given where we are today, that the Draft Plan does not recommend the obvious need to eliminate clearcutting in California. We ask that a full explanation be given as to why this has not been provided. Here again, had the Draft Plan taken its charge to review regulations, it would have evaluated these concerns, and recommended changes.

The Draft Plan fails to identify or acknowledge what role the Act must play in achieving the climate change mitigation and adaptation goals set forth. It fails to consider or discuss if or how the forest management goals it sets forth will be enforceable, under the Act or otherwise. It does not explain how forest management and restoration practices will be "informed by the expected future changes," and be "robust over a wide range of plausible future climate change outcomes." (*Id.*, at 13.) The Draft Plan does not say how it will achieve the recommendations set forth. (*Id.*, at 100-101.) It provides no consideration of how a "focus on overall forest health and accompanying implementation of the recommendations identified in [the plan] will help to diversify management practices, and will achieve the [plan's] goal of sequestering and maintaining more carbon over time." It is totally unclear how this plays out. And, to the extent the Draft Plan claims it is the "detailed implementation plan" for the 2017 Scoping Plan Update, that document does not even list the Act as a applicable law or regulation pertaining to forest resources in California. (*See*, 2017 Update, Appendix F [Environmental Assessment], Attachment A, Table A2-2, at 149-152.)

The Draft Plan relies heavily on the concept that regional implementation is needed, with development of "Forest Carbon Action Plans." (*Id.*, at 5.) In doing so, it ignores the Act's three district forest district divisions. (*See*, Pub. Res. Code § 4531.) The Draft Plan does not explain how this regional implementation will occur, particularly given the existing Act. Is the intent to replace the Act, at least as it governs private land forestry operations? The current Act limits what local areas may do. Local governments have no authority to regulate the conduct of timber operations, except where authorized by the Board or the parcel is less than three acres and not zoned Timberland Production Zone. (*See*, *Big Creek Lumber Co. v. County of San Mateo* (1995) 31 Cal.App.4th 418, 424; Pub. Res. Code § 4516.5(d).)

While the Draft Plan advances the intent to work regionally, it provides no context of the current regulatory scheme, nor how it is to be done, coordinated, under what regulatory scheme, and how it may enforced. (See, Draft Plan, at 22.) Nor does the Draft Plan explain how "[n]ew information and tools will have a great impact as the Forest Carbon Plan begins implementation at the regional level and as strategies turn into actions." (Id., at 117.)

The existing statutory scheme does not constrain what private forestland owners do—it regulates what they do. Thus, when the Draft Plan claims that private landowners, "may be induced to improve management for carbon sequestration and other public benefit outcomes through incentive payments," id., at 29, it fails to explain just how this will occur, particularly under existing law. Is California intending to pay commercial enterprises for proper management of their lands? Similarly, under what mechanism will private commercial timberland owners be required to report carbon stock and GHG flux? (Id., at 45.) What is the method by which this will be included in the review of proposed logging operations, in a manner that is transparent and enables the public to readily review the information?

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 14 of 23 The current Rules have "minimum resource conservation standards," or "minimum stocking standards." (See, 14 Cal. Code Regs. § 912.7.) The Draft Plan proposes to "increase annual area reforested by 25% over the current level by 2030." (Draft Plan, at 31.) No explanation is given as to how this will be done, and under what authority. How will private landowners be required to do this, if it is not part of the existing Act?

The Draft Plan proposes to explore opportunities for regulatory and policy changes and streamlining for various activities, including the increased use of fire and for restoration and to develop new wood product and biomass facilities. (*Id.*, at 6.) This translates into seeking exemptions to allow for forest "treatments" or "thinning" which is proposed as a major management scheme. (*See e.g.*, *Id.* at 16, 18, 29, 30, 41, 113.) Once again, with no mention of the Act, it appears the Draft Plan wants to change the rules, with no explanation as to what is the current regulatory scheme, what rules should be changed, and how those changes could conflict with the Act, as well as other laws such as CEQA. This is a bold attempt to undermine necessary environmental and public review.

B. The Forest and Rangeland Resources Assessment and Policy Act Informs Forest Practices.

Relevant to the Draft Plan and its need to understand forestland conditions in California, is the "Forest and Rangeland Resources Assessment and Policy Act" ("FRAP"), an additional tool created in 1977 to protect our state's forest resources to ensure adequate and continuous understanding of the value of our forested resources. FRAP also documents the significance of our forest resources, and the need to continually understand the needs and constraints of those resources. The Legislature found that although our forest resources "provide vitally important economic and environmental benefits," "[f]orest resources in California are limited," and "[d]emands on forest resources in California are expected to increase significantly in the next decades." (Pub. Res. Code §§ 4789.1(a), (c).) The Legislature determined that "[b]etter use of forest resources can result where there is good information as to anticipated needs and constraints and the potentials for meeting such needs consistent with Section 4513." (Id. subd. (d).)

FRAP is to "provide for the assessment of California's forest resources in order to develop and implement forest resources policies for the state." (*Id.* subd. (f).) FRAP imposes a duty on CAL FIRE to provide regular and timely assessments of our state forest resources.

"[U]nder policy guidance from the board and in consultation with the Secretary of Resources, the director [of CalFire] shall prepare and submit to the board and the Secretary of the Resources Agency, a preliminary forest and rangeland resource assessment and analysis not later than July 1, 1979, and shall present a full and updated assessment by January 1, 1987, and by January 1 of each fifth year thereafter." (Pub. Res. Code § 4789.3(a), emphasis added.)²

Based on this, reports were due in 1992, 1997, 2002, 2007, 2012, and prospectively, in 2017. Currently, the most recent (2008) report was issued only in 2010. No report has been issued since. (See, CalFire, California's Forests and Rangelands: 2015 Assessment,

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 15 of 23 The FRAP assessment also "shall recognize distinct differences in ownership and management of forest and rangeland resources in California between the various public and the various private owners." (*Id.*)

The FRAP assessment is to include, among other items:

- "(1) An assessment and analysis of the supply and availability of the various present and potential forest and rangeland resources of the state;
- (3) An analysis of present and anticipated demand for various forest and rangeland resources in the state;
- (5) A discussion of important policy considerations, laws, regulations, management responsibilities, and other factors expected to influence and significantly affect the use, ownership, and management of forest and rangeland resources." (*Id.* subd. (a)(1), (3), (5).)

According to FRAP, CALFIRE is responsible for regulating and tracking certain activities, such as timber harvest and vegetation management, as well as providing land owner advice about sustainable practices. The Forest Practice Rules provide guidance for sustainable timber harvesting. Additionally, CAL FIRE provides incentives and assistance for sustainable private forest and range stewardship such as the California Forest Improvement Program ("CFIP"):

"When assessing the conditions of forests and rangelands every five years, we want to know if CALFIRE's management policies and assistance programs are working to create sustainability. We want the ability to track over time if conditions are improving or deteriorating. But then again, we need to know what "improving" means, and conversely, what "deteriorating" means. In short, we need to have a definition of sustainable and some agreed upon ideas of what to measure to assess progress toward or away from it." (CALFIRE, "FRASC: California's Montreal Protocol Criteria and Indicators," http://bit.ly/2j1WqVj, last visited Jan, 11, 2017, emphasis added.)

Such an assessment of our forests, at this time of critical change due to rapidly evolving climate conditions, is fundamental to understanding the relationship of logging to climate change and to implementing a framework to reduce GHG emissions and protecting our forests for this and future generations.

Despite the requirement to assess conditions "every five years," the scheduled—and already tardy—2015 Assessment has not been done, leaving regulatory management of our forests without key information and guidance necessary to inform decision-making. Instead of having this required and timely information, the Draft Plan is forced to rely upon Forest Service data, through its Forest Inventory Analysis Program. (*Id.*, at 43.) The FIA has its limitations, and frap.fire.ca.gov/assessment/2015/assessment2015, last visited Jan. 11, 2017.)

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 16 of 23 is not current given its 10-year cycle of analysis. (*Id.*, at 43, 62.) Even though the FIA information is recognized as a sufficient protocol, the failure by CAL FIRE to do its job to ensure timely reporting of forest conditions undermines the Legislative directives to timely and consistently develop reliable data about our forest lands.

C. The Forest Carbon Plan Fails to Comply with CEQA.

There can be no question that the Forest Carbon Plan must be evaluated under CEQA. If it is intended as a stand-alone document, as it describes itself as the "detailed implementation plan for the forest carbon goals embodied in the 2030 Target Scoping Plan Update," (Draft Plan, at 1), then it must be evaluated under CEQA. If it is not a stand-alone document, but intended to be part of the 2017 Update, then it should be evaluated as part of that project in its Environmental Assessment. It is not. And, to the extent it is intended to be the "foundational component" of the Natural and Working lands Climate Change Action Plan identified in the 2017 Update, it should be evaluated in the 2017 Update Environmental Assessment. It is not.

The Forest Carbon Plan is a project under CEQA as it is a discretionary action undertaken, supported and authorized by a public agency—in this case, and based on the 2014 Update, CALFIRE, CNRA and CalEPA. (Pub. Res. Code §§ 21065(a), 21080(a); 14 Cal. Code Regs., §§ 15357, 15378(a); Friends of Mammoth v. Board of Supervisors (1972) 8 Cal.3d 247, 262; Citizens for Non-Toxic Pest Control v. Department of Food & Agric. (1986) 187 Cal.App.3d 1575.) And, it is a project which may cause physical change to the environment, particularly through the use of thinning and other management techniques, and the advancement of biomass and biomass facilities. (Pub. Res. Code § 21065; 14 Cal. Code Regs., §§ 15060(c)(2), 15378(a).) No exemption applies.

The Draft Plan does have the potential to significantly adversely impact the environment. A key example is the thread throughout the document to engage in extensive "treatment" or "thinning" for management. This requires environmental review. Moreover, to the extent the Draft Plan leans toward securing regulatory 'exemptions' to implement this strategy, there is an even greater need to understand the full component of what effects such management may cause. While the Draft Plan assumes that "thinning" for management will facilitate, in the very long term, forested conditions to increase carbon sequestration, it provides no analysis of what may be the real environmental consequences in the course of the years during which this management will unfold.

The proposed enhanced use of exemptions, which is not evaluated in Section 4.2.1 of the Draft Plan, appears key. (Draft Plan, at 41.) Yet, such a proposal means there will be no public or other agency review, and no environmental analysis of any proposed management scenario. The Draft Plan notes that a report to the Legislature on the use of exemptions was due at the end of this year 2017. (*Id.*) We are concerned that the Draft Plan lays the foundation for the report to advance this expanded use of exemptions. Instead, the use of exemptions needs to be limited, given existing practices to use them when not appropriate.

It is common practice, for example, for many large industrial timber companies to submit annual notices to CAL FIRE to conduct exempt timber operations to remove, "dead, dying, and

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 17 of 23 57-2

diseased," trees from their property throughout the year and at their discretion, relying upon 14 Cal. Code Regs. § 1038 in the Forest Practice Rules for the entirety of ownership, or for large areas of ownership, often totaling in the thousands of acres per-exemption. It is also known that exempt timber operations carried out pursuant to 14 Cal. Code Regs. §§ 1038 and 1052 ("Emergency Timber Operations"), are not analyzed for cumulative effects as part of other discretionary permits, such as THPs. At present, Emergency Timber Operations carried out pursuant to 14 Cal. Code Regs. § 1052 of the Forest Practice Rules contain no plain-language requirement to either meet minimum resource conservation standards post-operations or to artificially regenerate or have an artificial regeneration plan in the event minimum resource conservation standards are not attained immediately upon completion of operations. Thus, we have substantial questions and concerns about the lack of CEQA review of the Draft Plan, as it purports to encourage the Board of Forestry to contemplate expanding the use of ministerial CEQA permitting exemptions.

57-2 cont.

The Draft Plan must comply with CEQA before it proceeds any further. Because it is not clear under what statutory or agency authority this Draft Plan has been developed, we cannot comment on whether at this time any functional equivalent program may apply, which could inform the type of CEQA document to be prepared. Regardless, we believe that given the potential for significant individual and cumulative adverse environmental impacts which may result from the Draft Plan as written, an environmental impact report, or its equivalent, must be developed.

VI. The Forest Carbon Plan Relies on Unsupported Assumptions, Lacks Definition, and Fails to Identify Specific Actions to Meet Targets for Increasing Carbon Storage in California Forests.

A. The Forest Carbon Plan Lacks Definitions and Relies on Many Assumptions.

In addition to items identified above, here we identify provisions which lack definitions, and present assumptions without explanation.

For "treatments," the Draft Plan does not explain what is meant by thinning, e.g. vegetation management. (See, Draft Plan, at 16.) What are "large scale thinning treatments," and how are they to be regulated? What are "other similar stand-density reduction treatments" in addition to thinning? (Id., at 18.) The Draft Plan assumes that untreated areas are worse than treated areas, relying on a 2012 Dore report, without adequate explanation. (Id., at 17 fn. 36.)

On non-federal lands, the Draft Plan claims that CAL FIRE estimates increasing treatment on private lands to 500,000 acres per year, which the Draft Plan then concedes is not realistic. (*Id.*, at 29.) Thus, the Draft Plan projects an outcome based on an unrealistic assumption for levels of treatment. It becomes a "target . . . pending increased resources," which is just another assumption. (*Id.*). The Draft Plan goes on to assume that treatments "can include" those that generate revenue. (*Id.*). Yet, it fails to identify under what authority these treatments can be required, or subject to payments as revenue. The Draft Plan also assumes that there will be a doubling of the rate of fuels reduction treatments within three years, from 2017 to 2020, based upon the Vegetation Management EIR. (*Id.*, at 30.) However, this type of treatment is not subject

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 18 of 23 to regulatory controls on private lands.

The Draft Plan goes on to assume that there will be "successful fuel reduction and forest management activities [that] will result in reduced area of forestland impacted by wildfire statewide." (Id.) But this is based on it being "successful," without any measures to ensure and enforce these efforts, and no metrics to determine what is considered "successful." The Draft Plan claims that by "fuel reduction treatments and sustainable forest management . . . will aim to minimize total black carbon emissions from forests." (Id.) This is yet another assumption, based on a premise these things will occur, and will occur successfully, even though the Draft Plan concedes that it does not include "explicit, numerical emission reduction target for wildfire black carbon emissions." (Id.)

For growth, volume, and retention of large old trees, the Draft Plan also makes assumptions. For example, it assumes that lost carbon is sequestered within 15 to 20 years "if stand growth continues on the same trend." (*Id.*, at 19.) However, stand growth will be affected (adversely) by climate change. (*See, e.g.*, *Id.*, at 10, 11 ["drought impact[s] tree growth (and therefore carbon sequestration rates) during the drought itself, [and] that growth rates postdrought can remained stunted for one to four additional years."]; 17 [drought suppresses growth . . . would result in decreased carbon sequestration.]; and at 53, 54.) The Draft Plan also assumes, without documenting just how this will occur, that, "[t]imber and other biomass harvest volumes are expected to increase as a result of the forest management activities outlined above." (*Id.*, at 32.) The Draft Plan at one place advises that timber harvest volume has been trending upward in the last five years, (*id.*, at 50), yet elsewhere it advises that timber harvesting has been on the decline since the mid-1980's, (*id.*, at 71, 103). This contradiction underscores the need for clarity. Additionally, the Draft Plan incorrectly assumes that increases in growing stock and volume of wood in our forests will automatically extrapolate into carbon dioxide sequestration with no reference, or research cited or presented to support the assumption.

The Draft Plan states that the "carbon benefits from treatments that promote growth and retention of larger trees include increased sequestration rates, more stable carbon storage, and decreased risk from the growing threat of climate change." (*Id.*, at 60.) While we would agree that growth and retention of larger trees should increase sequestration rates, this provision fails to acknowledge that currently the Act does not include any such standards, and neither do the Forest Practice Rules. So how will this happen; what regulatory provisions will ensure, for example, retention of large old trees, particularly on private industrial timberlands or public timberlands? While we have a very good Forest Practice Act, we have a lead agency administering that Act which does not require MSP to facilitate this kind of management. How will that change? The Draft Plan does not identify the management scheme necessary for retention of large old trees and old forest stands.

The Draft Plan provides that the "carbon stock reported in each year will be in the tenyear rolling average of carbon stocks, so the value reported for 2015 is the average carbon stock over the years 2006 to 2015." (*Id.*, at 44.) The Draft Plan does not explain or justify a 10- year rolling average as appropriate for keeping track of GHG emissions over time. Given the climate crisis we face, justification for this proposal is necessary.

> Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 19 of 23

The Draft Plan also "does not include targets or propose direct protocols for co-benefits from activities intended to improve forest health, such as benefits to air quality, biodiversity, and watershed function." (*Id.*, at 87.) The Act would require their inclusion. Their omission here is further evidence of how the Draft Plan is not complete or capable of satisfying the directives of its creation or the Forest Practice Act.

The FCP depends on regional collaboration. (See, Id., Table 3 at 36.) The Draft Plan also relies heavily on ownership cooperation—by both the federal government and private timberland owners. Given the current federal administration, it is clearly unrealistic now to rely on the U.S. Forest Service to fulfill any existing metrics or maintain policies from previous administrations. This agency is going to have significant budget cuts. Our federal public lands are under assault, and at risk of being heavily exploited, if not lost. Under these circumstances, how can California require the federal government to do anything? (See, e.g., Id., at 28, 31, 32, 37, 38.) This includes any expectation of funding. Similarly, reliance on private industry does not guarantee anything. (Id., at 44, 49.)

Lastly, the Draft Plan is based on assumptions as about funding. (See, Id., at 38.) It assumes that non-monetary resources will be given through technical assistance, and tools that identify forest conditions. (Id., at 39.) It does not explain how this information will be developed or adequate. Further, the Draft Plan assumes financial assistance may be available to assist with regulatory compliance by private landowners. (Id., at 43.) No explanation or actual basis is provided to support these kinds of claims.

B. The FCP Does Not Provide Effective Actions Needed to Increase Carbon Storage in California Forests.

The FCP states "California cannot meet the climate change goals of either this Draft Forest Carbon Plan or the broader Natural and Working Lands strategy without increasing the levels and resilience of forest carbon sequestration and storage in its wildlands forests." (*Id.*, at 26.) The Draft Plan fails to define specific actions to ensure this outcome, which can be enforced in a manner that is transparent and subject to the Act. The Forest Carbon Plan fails to provide concrete regulatory proposals which would restore the Legislative policies and require actions. Even the implementation measures set forth in Chapter 4 provide very little in the way of taking action; while it speaks about high-level performance objectives - and implementation goals, it fails to set forth concrete action necessary to increase carbon storage in California forests. (*Id.*, at 44.)

Some examples include the proposal for non-federal lands, to "increase annual area reforested by 25% over the current level by 2030." (*Id.*, at 31.) This is a statement of intent, with no clarity as to how it will occur, be regulated and ensured. Similarly, the claim is made that transportation of forest biomass will be limited to local areas. (*Id.*, at 32.) There is no mechanism in place to make that happen, and no concrete proposals to make sure it happens.

The goals for forest health described in the FCP call for, in most instances, a significant increase in the pace and scale of management activity beyond what can be supported by existing funding levels, such that "[t]o meet these goals, the complex collaborations and implementation

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 20 of 23 strategies needed to achieve the goals of this Forest Carbon Plan will need to leverage resources from existing state, federal and private efforts." (*Id.*, at 36, 37.) And some of those resources are subject to annual appropriation decisions, so may not be reliable. (*Id.*) In other words, there may be resources in the future, but it is not clear what will be available. Indeed, according to the FCP, the "CNRA will seek resources to develop and implement a centralized database to track implementation activities identified in this plan by December 31, 2018." (*Id.*, at 46.) This means that only a search for funding will occur in two years' time. At some later time a data base for tracking activities may be developed, depending on funding. So there is no assurance that activities will be implemented or tracked. It is only an effort "to seek resources." Without funding, the FCP cannot achieve even the minimal proposals its sets forth, particularly in the time frame needed. When the FCP claims the need for repetition and maintenance of fuels treatment, *id.*, at 61, it does not, and cannot, provide any specific action which is assured and can be enforced.

Further, the presumption that turning un-merchantable forest materials into biomass for a fuels source, with cogeneration is "carbon-neutral" and a net-carbon savings is not founded in facts or the available research. Here again we refer to the Peer Review of Dr. John L. Campbell:

"When un-merchantable harvest residue finds its way to a mill, utilizing it for energy through combustion is reasonable, but to credit this entire carbon stream as a carbon offset denies the fact that a an equal amount of energy could have been acquired through the combustion of much less fossil fuel and the fact that energy demand by the mill was itself created by the harvest. As it pertains to the objective of the CFCP, fuel offsets should apply only to any residual energy sent to independent users, with the additional realization that just because a fuel source is renewable does not make it carbon neutral." (Campbell, 2017, Peer Review of CFCP, at 4-5.).

VII. The Forest Carbon Plan Fails to Acknowledge The Role of Offsets.

In addition to the Draft Plan's failure to acknowledge or grapple with the reality of preexisting governing statues and regulations, the Draft Plan also fails to acknowledge, discuss, or analyze in a meaningful way how the actions proposed may impact market-based carbon offset trading under the current AB 32 Cap-and-Trade system or under the guise of the Federal Forest Carbon trading system. Currently, private industrial timberland owners in California, such as Sierra Pacific Industries ("SPI") (the largest industrial land owner in California), and Green Diamond Resource Company sell carbon offsets for designated timber projects. As we understand this practice, this means a company like SPI develops a timber project, which it characterizes as a good carbon sequestration action. It gets credits for that project, and provides offsets to another industrial emitter, like a fossil fuel industry entity, e.g. Chevron. In this way, while a company such as SPI appears to be creating net carbon sequestration in its project, it sells some or all of that sequestration to another polluter, who in turn then can use it to claim an "offset" for its emissions. The other polluter does not actually reduce its emissions, but instead relies on the offsets from elsewhere to get credit for reduced emissions. The net effect of this practice is that the people and environment in which those real time emissions occur still are exposed to those emissions; the offsets do not reduce emissions, they simply give credit for

> Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 21 of 23

better practices elsewhere.

This process has at least two consequences for the Draft Plan at issue here. **First**, the Draft Plan references "offset projects" as evidence of improving management for carbon sequestration, *id.*, at 29, 38, but does not acknowledge how this is contributing to ongoing GHG emissions from the fossil fuel industry. Nor does it discuss how this practice will be factored in terms of increasing carbon storage in California's forests. California needs reductions in GHG emissions, not forest offsets to allow continued GHG emissions in other sectors. If carbon storage is being "sold" to give offsets for other GHG sources, then it is not increasing carbon storage, and certainly is not assuring increased net carbon sequestration over time. Based on this, it appears that GHG reductions are not actualized, but simply are being traded and shuffled around like any other market commodity with no assurance or verification of the authenticity of the purported outcome.

Second, this practice has an environmental justice impact which the Draft Plan fails to acknowledge or even address. It is worth noting that in the 2017 Update, the Environmental Justice Advisory Committee recommended that as matter of equity, for Natural and Working Lands "timely and comprehensive data collection is essential to avoiding negative impacts and ensuring co-benefits. Such data must include: a. emissions from forestry and wood products, since forest management is a net source of greenhouse gases." (2017 Update, Appendix A: AB 32 Environmental Justice Advisory Committee (EJAC) Initial Recommendations for Discussion Draft Version of 2030 Target Scoping Plan Update August 26, 2016, revised December 22, 2016, at 19 of 25, emphasis added.)

Forest offsets are allowed, permitting emissions to occur elsewhere. This means air quality may not benefit. This has direct impacts on many different populations, including those more vulnerable populations like in the Central Valley. And it has a direct impact in terms of the ongoing GHG emissions. Offsets from forestry must not be allowed. Our forests must not be assumed to be or offered as compensation for fossil fuel industry GHG emissions. These must be separately accounted, and our forests must be protected to ensure the high quality resources they provide, such as water, fisheries, and wildlife.

CONCLUSION

The Forest Carbon Plan needs to be entirely redone. Further, it needs independent peer review. EPIC suggests that future peer review guidelines be conducted pursuant to the guidelines established by the federal Office of Management and Budget's "Final Information Quality Bulletin for Peer Review" for "influential scientific information." (See Office of Management and Budget, Budget's "Final Information Quality Bulletin for Peer Review," Dec. 16, 2004, available at

http://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf). Further, the Forest Carbon Plan requires accompanying CEQA analysis. And it must satisfy the directives which identified its existence, and provide a clear statement of authority, process for review and action, its implementing authority, with express understanding and relationship to the existing Forest Practice Act and in reliance upon contemporary FRAP information. As a matter of policy, the use of thinning as the management scheme must be revisited, and under no

Environmental Protection Information Center 145 G Street, Suite A, Arcata, CA 95521 | (707) 822-7711 www.wildcalifornia.org Page 22 of 23 circumstances should the use of exemptions be available for any such management.

Respectfully Submitted,

RO6-80, Pan

Rob DiPerna

California Forest and Wildlife Advocate

Environmental Protection Information Center (EPIC)

LIST ATTACHMENTS

CAMPBELL, JL. (2017). Peer Review of California Forest Carbon Plan. *Prepared for Ebbetts Pass Forest Watch*.

HARMON, 2010. Letter to California Air Resources Board re: CAL FIRE Greenhouse Gas Calculator.

Appendix A – Comment Letters



Sent via Electronic Mail to CARB on date Shown Below https://www.arb/ca/gov/lispub/comm/bclist.php

April 7, 2017

Ms. Mary Nichols, Chair Members of the California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Comments Regarding CARB 2017 Scoping Plan Update for Achievement of California's Greenhouse Gas Reduction Targets

Dear Chair Nichols and CARB Board Members:

The following comments are submitted on behalf of the Environmental Protection Information Center (EPIC). EPIC appreciates the opportunity to provide comments on this most important issue, and respectfully requests a formal written response to all comments contained herein.

I. Introduction and General Comments

EPIC is a regional non-profit forest advocacy organization with a 40-year history of protecting and advocating for the wild and special places of Northwest California, a region predominantly renowned for its impressive forests and vast and unique wilderness areas. EPIC's mission is to employ an integrated science-based approach to advocacy aimed at protecting and restoring Northwest California's forests and wildlands, on both federal and non-federal forestlands. We need to look no further than our own bioregions, the North Coast redwoods, and the mountains of the Klamath-Siskiyou, to demonstrate how past mismanagement and wanton nearly wholesale destruction of our native, "old-growth" forests have lead to, and continue to be additive upon, the greatest crisis of our time, global and bioregional climate change.

Post-European settlement in our region was a free-for-all grab-bag period in our history, where the Gold Rush of the 1850's, and the Timber Rush that followed lead to the stripping of our natural and native landscapes for the benefit of extraction of wealth and capital. Today, only somewhere between three to five percent of our original native "old-growth" coastal redwood forests remain, with virtually all that does remain contained in small, disjointed, and scattered public lands ownerships, surrounded by seas of urbanization, conversion, clearcuts and development. One study (Slauson 2012), estimates that all the acres contained in our redwood parks and reserves today in Northwest California, that only approximately 40 percent of that land

Environmental Protection Information Center 145 G Street Suite A Arcata, CA 95521 (707) 822-7711 www.wildcalifornia.org itself is even in the native "old-growth" condition. According to estimates by Save-the-Redwoods League (2016), approximately 77 percent of the land base that used to be occupied by our native coast redwoods is still in private ownership.

Why does this matter? First, the near complete destruction of our native redwood forests resulted in untold amounts of forest biomass, trees and non-tree woody herbaceous matter, being stripped from our forests, never to be replaced again on the landscape. With this loss comes a commensurate massive-scale emission of carbon dioxide into our atmosphere and a tremendous depletion in the ability of our forests to sequester carbon dioxide now, and into the future. Retaining and protecting what remains is key. A recent study conducted by researchers at Humboldt State University (Van Pelt 2016), found that a single acre plot of native, "old-growth" coast redwood forest growing in Jedidiah Smith Redwoods State Park is sequestering more carbon dioxide per-acre than any other forest type on earth, including forests in the tropics.

Additionally, our Klamath-Siskiyou bioregion is one of the most unique and diverse on the planet. The Klamath-Siskiyou are famous for their stunning diversity, ruggedness, and importantly, it's vast high-country mountainous wilderness areas and the snow-pack that accumulates there are an essential source of water for our entire state, and serve as a barometer for gauging and metering the effects of global and bioregional climate change. The forests of the Klamath-Siskiyou bioregion are largely federally-owned, mostly administered by the U.S. Forest Service. The Klamath-Siskiyou is a hot-spot for biodiversity, with some accounts claiming over 30 different kinds of conifer trees growing throughout the vast region on different types of sites and elevations.

If California is to reduce GHG emissions and utilize our forests as the best, and really, only weapon we have to actively combat climate change by sequestering more carbon dioxide in living, green, woody herbaceous matter, such as the trees in our forests, much more definitive, decisive, and immediate action is necessary than currently contemplated by the CARB or the state more generally. As discussed in these comments, the 2017 Scoping Plan Update fails to account for, or to take advantage of the enormously important opportunities afforded by protection and better management of California's forests, particularly those in our coast redwood and Klamath-Siskiyou bioregions. As explained herein, it's simply not enough to reduce present and future GHG emissions without a commensurate plan that can also sequester carbon dioxide in the earth's atmosphere.

To the extent the 2017 Scoping Plan Update is predicated upon a continuation of the capand-trade regulation, a regulation predicated upon the premise of using forestlands as offsets for
fossil fuel polluting sectors like oil and gas, this provides more of an urgent impetus than ever to
have a solid, concrete, feasible, enforceable plan for the protection, conservation, restoration, and
management of California's forestlands. To date, this critical element is entirely missing from
the Plan and any of its proposed alternatives, rendering the prognosis for effectiveness and
success of attaining claimed GHG reduction targets highly unlikely. To the extent CARB and
past scoping plans have relied on the cap-and-trade regulations and forest offsets in the past,
EPIC fundamentally questions the validity of any reductions or offsets of GHG emissions
claimed, as virtually none of any of the purported reductions are at-source, and CARB appears to
have no way to verify the legitimacy of reductions or offsets claimed predicated upon forestry
projects. Simply put, it appears at best to be a shell-game of moving and out-sourcing GHG
emissions predicated upon reductions or sequestration from forests that cannot be assured or
verified by CARB or "truthed" by public interest groups such as EPIC.

GHG reductions, carbon sequestration, and real measures with real changes to combat and adapt to the growing realities of climate change cannot simply be left to industry and voodoo accounts to execute and ensure. Further, relying upon other state agencies, such as the Department of Forestry and Board of Forestry, to take seriously the threat of climate change and the mandates imparted by the Governor, Legislature, and any CARB plan, is simply a false hope destined for failure. As such, EPIC strongly encourages CARB to substantially revise and overhaul the 2017 Scoping Plan Update to ensure that reductions claimed are legitimate, and that our forests are protected, conserved, and restored for the greater good of all the people of the State of California.

II. Specific Comments Regarding 2017 Scoping Plan Update

A. Failed Nexus between 2017 Scoping Plan Update and Forest Carbon Plan

The 2017 Scoping Plan Update appears to contain no reference at all the California Forest Carbon Plan, released in Draft form by the Forest Climate Action Team (FCAT), on January 17, 2017. The public comment period on the Draft Forest Carbon Plan was closed as of March 17, 2017. A copy of EPIC's comments on the Draft Forest Carbon Plan are attached and incorporated by reference herein. (Attachment A.)

The 2014 CARB Scoping Plan Update called for the creation of a "Forest Carbon Plan," that contained "[q]uantitative planning targets must be set to increase net forest carbon in California in the near term, mid-term, and by 2050, while ensuring forest resilience, health, and continued ecosystem services. Forest carbon inventory and assessments should be continually maintained and refined to support this effort, and appropriate measures, funding, and incentives must also be established." (See: 2014 Scoping Plan Update, at pp. 72-73.) The "[s]pecific actions to meet these planning targets for increasing carbon storage in California forests will be laid out in a 'Forest Carbon Plan' (Plan)." (Ibid.) However, the Draft Forest Carbon Plan is not referenced or mentioned at all in the 2017 Draft Scoping Plan Update.

While the lack of reference to, or acknowledgment of the Forest Carbon Plan in the 2017 Scoping Plan Update is quizzical, the failure of the January 17, 2017 Draft Forest Carbon Plan to meet any of its mandates or objectives as stated for the Plan in the 2014 Scoping Plan Update is even more so. Here, as with the cap-and-trade regulation, discussed elsewhere herein, it appears that one hand simply has no idea what the other is doing. Indeed, the January 17, 2017 Draft Forest Carbon Plan itself claims to be the, "detailed implementation plan for the forest carbon goals embodied in the 2030 Target Scoping Plan Update." (Draft Forest Carbon Plan, at p. 1.) Yet, we find no mention of the Draft Forest Carbon Plan and its mandates and objectives can be found in the 2017 Scoping Plan Update to attain the 2030 GHG reduction targets.

As our comments on the Draft Forest Carbon Plan reveal, it does not meet any of the objectives articulated in the 2014 Scoping Plan Update, and does not contain many of the elements required. Further, there is no nexus to governance, administration, regulation, or implementation of the Draft Forest Carbon Plan to be found. While it seems clear that the CARB 2017 Draft Scoping Plan Update and its associated Environmental Assessment are not construed or developed to rely upon the Draft Forest Carbon Plan, EPIC maintains this constitutes a major failing of the 2017 Draft Scoping Plan Update and raises substantial questions as to the prognosis

58-1

for success of attaining GHG emissions reduction and carbon dioxide sequestration targets now and into the future.

B. Failed Nexus with Mandates of Assembly Bill 1504 (2010)

The 2017 Draft Scoping Plan Update makes reference to 2010 Assembly Bill 1504, pertaining to forestry and carbon dioxide sequestration, stating:

"AB 1504 requires the Board of Forestry and Fire Protection to adopt district forest practice rules and regulations in accordance with specified policies to, among other things, assure the continuous growing and harvesting of commercial forest tree species. The bill also requires the Board of Forestry and Fire Protection to ensure that its rules and regulations that govern the harvesting of commercial forest tree species consider the capacity of forest resources to sequester carbon dioxide emissions sufficient to meet or exceed the sequestration target of 5 million metric tons of carbon dioxide equivalent (MMTCO2e)/year net annually, as established in the first AB 32 Climate Change Scoping Plan. (2017 Draft Scoping Plan Update, at pp. 4-5.)

It is now seven years, and two scoping plan updates later, and the Board of Forestry has completely abdicated its statutory duties to undertake the directives identified in AB 1504 by the legislature. The Board of Forestry has taken no actions whatsoever to ensure that its rules and regulations governing timber harvesting on private forestlands in California are consistent with the objectives of AB 32, the 2008 Scoping Plan, or any subsequent Scoping Plan Update.

AB 1504 established the 500 metric tons of carbon sequestration per-year target as an interim target based on the presumption that prevailed at the time that California's forests are a net sequestration source of carbon, not a carbon sink. Research conducted since, including research conducted on behalf of CARB (Battles et al. 2015), and others (e.g., Gonzales 2015), strongly suggests that California's forests are in fact not a net sequestration source of carbon dioxide, but rather a net sink and, essentially that California's forests are emitting more carbon dioxide than is being stored.

It is entirely unclear from reading the CARB 2017 Draft Scoping Plan Update if the 2010 sequestration target established for the private forestry sector by the Legislature in AB 1504 is being considered as part of the overall strategy and carbon dioxide budget accounting to demonstrate attainment with the 40 percent below 1990 emissions levels 2030 target established by SB 32 in 2016. To the extent that the 2017 Draft Scoping Plan Update relies in any way upon the premise of carbon sequestration from California's forests, this fact must be more plainly stated, and the rationale more plainly presented and analyzed in the Environmental Assessment contained at Appendix F, which has not been included at-present.

C. Lack of Progress on Natural and Working Lands Sector

The lack of a solid plan with discrete actions, GHG emissions limits, and carbon sequestration targets predicated upon present-day best available science and information is a substantial flaw in the 2017 Draft Scoping Plan Update. Appendix G to the Draft Plan provides little more than base-line level information, with lots of charts and graphs that do not actually amount to any real assessment, evaluation, decision-making, enforcement, or objectives to attain. There seems to be a "kick-the-can" approach to addressing the significant issues surrounding our natural and working lands industry sectors, and this amounts to more than even the proverbial

4

58-2

elephant in-the-room. EPIC fundamentally questions how the CARB and the 2017 Draft Scoping Plan Update can continue to allow polluting sectors, such as oil and gas refineries, to continue polluting above and beyond the declining sector caps on the premise of working forestlands being used as carbon credit offsets in the absence of an analysis of the current or projected future conditions of our forests, the dynamics of a carbon loss and gain budget on our natural and working lands, and more specifically, how the forestry sector serves to facilitate a carbon offset program. We address separately the Cap-and-Trade regulations below.

Lacking a solid plan to ensure California's natural and working lands are functioning as a base for increased carbon dioxide sequestration, rather than a net source of ongoing emissions, the 2017 Draft Scoping Plan Update and the basic underpinnings of the entire program to attain the GHG reduction target mandates of SB 32, are in question, and at risk of failure.

D. Failed Nexus Between Forestry Offsets and the Cap-and-Trade Regulations

With the 2017 Draft Scoping Plan Update having no nexus to either the Forest Carbon Plan or a way to ensure forestry practices focus on increased sequestration of carbon dioxide from the atmosphere, it seems foolhardy at best to continue the status quo and allow the Capand-Trade regulations to facilitate carbon credit offsets from private lands forestry projects. Although registered forestry projects must meet certain criteria and compliance must be verified by a third-party certification entity, this does not ensure improved forestry practices and increased carbon sequestration on a landscape or state-wide level. The Cap-and-Trade regulations generally, and the 2017 Draft Scoping Plan Update specifically, appear to have no awareness of pre-existent and prevailing laws and regulations governing the conduct of timber harvesting activities on private forestlands in California. There seems to be a fundamental disconnect between California's landmark efforts to combat climate change and the prevailing realities of the forest products industry in the state.

No better example of this disconnect can be found than by looking to registered carbon projects. Sierra Pacific Industries, the largest forestland landowner in the State of California, has registered a number of carbon projects under the titles of "Wildfire Reforestation Projects." (Ref: CAFR5163, CAFR5164, CAFR5165, CAFR5166, CAFR5167, CAFR5168; CARB I.D. Numbers.). While the exact nature, extent, or locations of these registered carbon projects is not known, registering these "wildfire reforestation," projects as presently sequestering carbon is an obvious misnomer. SPI's management practices create the harmful conditions which can cause fires, a dangerous source of carbon emissions. These kind of conditions are documented. Rather than require a forest accounting in which these emissions are allocated, SPI secures an offset credit for its "reforestation." But, existing law requires a company like SPI to replant and invest in reforestation, including post-fire replanting. Post-fire recovery does not mean SPI is increasing sequestration of carbon in its forests; it may well mean only that it is trying to account for the emissions it has caused.

First, SPI timber harvesting practices, are heavily predicated upon the use of evenaged silviculture and plantation model forestry, resulting in forest conditions that are far more fire-prone, and prone to high-intensity fire than other silvicultural methods or as was found in reference stand conditions. This outcome is recognized. The Draft Forest Carbon Plan, discloses that many of California's forests remain unhealthy and overcrowded. (Draft Forest Carbon Plan, at p. 16.) The Draft Forest Carbon Plan refers to the "current unhealthy state of forests." (Id., at

p. 18.) Scientists are concluding that California forests as they currently are will not be successful in absorbing those changes (from climate change impacts drought and temperature) as they once did. (*Id.*, at p. 53.) On private corporate timberlands, there is "slightly" more growth than removal, with "less carbon stored per acre in live tree inventories, as they don't get as old and large as trees on public landscapes, but mortality is much lower." (*Id.*, at p. 74.).

The stand conditions described in the Draft Forest Carbon Plan are exactly the stand conditions found in SPI evenaged regenerating low-elevation pine plantations in the South Sierra Nevada. The Draft Forest Carbon Plan recognizes these conditions as undesirable. Yet Cap-and-Trade permits, without an accounting of emissions and sequestration, registration of carbon sequestration "offset" projects on lands that either were subjected to fire as a consequences of management like SPI's or for projects that will replicate these same exact conditions again.

Second, existing law requires a company like SPI to ensure that replanting and investment in reforestation is ongoing. In this way, it should be seen as some kind of benefit to be sold as an "offset," because, in the best of all management, reforestation is intended to account for the emissions which have occurred as result of logging management. The 1982 California Timberland Productivity Act, Government Code § 51100 et seq. (TPA), created the Timber Production Zone (TPZ) designation for private timberland owners. The TPA also created a taxation structure for private timberland owners whereby annual volume by board-feet peryear were taxed based on reporting to the California Board of Equalization. In enacting the TPA, the Legislature stated that California's policy is to:

"do all of the following:

- (1) Maintain the optimum amount of the limited supply of timberland to ensure its current and continued availability for the growing and harvesting of timber and compatible uses.
- (2) Discourage premature or unnecessary conversion of timberland to urban and other uses.
- (3) Discourage expansion of urban services into timberland.
- (4) Encourage investment in timberlands based on reasonable expectation of harvest." (Government Code § 51102(a)).

California's Forest Practice Act and Rules govern timber harvest and regeneration on private forestlands, and clearly require that the logged area be adequately "stocked" after logging, either with trees left on site or to be adequately replanted within 3-5 years following timber operations. (See: Public Resource Code § 4561; 14 Cal. Code Regs., § 912.7 [932.7, 952.7].)

These laws requires SPI to replant and invest in reforestation of its timberlands. While a legal requirement, it is also in SPI's best financial interest to provide this reforestation, including post-fire artificial regeneration on its lands. Unfortunately, these laws do not require a carbon accounting, which would document the level of emissions generated from logging practices and fires which may occur as a result of those practices. As a consequence, the "wildfire reforestation" projects SPI registers as "offsets" proceed without an understanding of SPI's emissions generated from its practices and fire. SPI "offsets" are predicated upon the need to conduct post-fire artificial regeneration, which, again, is an existing SPI obligation under state

law. Whether or not it provides an "offset" for SPI's management which generated emissions, cannot be established in the absence of an accounting.

Further, the current "stocking" standards for evenaged management such as SPI's mandate either retention of 50 square feet basal area per-acre, or artificial regeneration to a 300 point-count. (14 Cal. Code Regs., § 912.7 [932.7, 952.7].) This kind of artificial regeneration following evenaged logging is one of the factors leading to over-dense, drought, beetle, and fire-prone forest stand conditions. The Board of Forestry understands this, but has yet to change these standards to effectively address these consequences.

The Cap-and-Trade regulations present very real and egregious social, environmental, and economic injustices that accrue as a consequence of its program. While the additional 20 percent reduction in the refinery sector proposed in the Preferred Action in the 2017 Draft Scoping Plan Update is laudable, it is simply not enough. While an additional 20 percent reduction may accrue some progress, it simply fails to meet muster when the dire state of the climate and many of the disadvantaged people and communities of our state are taken into account. It is simply unacceptable to allow the rich oil and gas conglomerates to continue harming our environment, our climate, our people, our economies, and our communities for the sake of ever-continuing greenhouse gas emission, and of course, out-sourced corporate profits. The CARB is asking the people of this state, and the most disadvantaged among them, to disproportionately shoulder the burden of the fossil fuel industry, a multi-trillion dollar global industry, and the one most primarily responsible for greenhouse gas concentrations in out atmosphere and the climate change crisis we all now face. By allowing the forestry offsets to companies like SPI, CARB facilitates this corporate advantage beyond the fossil fuel industry. It is simply unacceptable to enable the continued corroding of our climate, our environment, and our communities out of deference to the rich, and only so they may get richer still, while asking the poor, and in truth, the majority of Californians, to continue paying the price.

58-3

III. Conclusion

The 2017 Draft Scoping Plan Update is a vital component to the overall success of California's ambitious, albeit necessary strategy to combat and adapt to the realities of global climate change. That said, its compartmentalized approach fails to achieve the comprehensive holistic strategy desired. Without real, enforceable, and measurable standards for the natural and working lands sector, particularly as pertains to private land forestry practices, the Draft Plan is incomplete and doomed to failure. EPIC strongly urges the CARB to resist the temptation to kick the can down the road on modeling and regulation for the natural and working lands sector, and to by no means, defer to an inept and incapable California Department of Forestry to enable further timber industry "business as-usual" antics.

EPIC requests that CARB defer decision on the 2017 Scoping Plan Update, and suspend all Cap and Trade provisions including forestry offsets, until, at a minimum, it can be informed by:

- (1) a valid Forest Carbon Plan;
- (2) credible evidence from the Board of Forestry that the forest practice regulations meet the requirements of AB 1504;

7

- (3) completion of the Natural and Working Lands sector modeling and assessment process is complete; and
- (4) a reliable accounting mechanism for all forestry projects to document emissions generated and carbon sequestered.

The challenge of global climate change is the greatest of our time, and perhaps the greatest in human history. To meet this challenge with half-measures, and more of the same and "business as usual" economic, legal, and regulatory structures can only lead us to the same results that have lead to the causes of our catastrophic climate crisis in the first place. California's forests are our last, best weapon available to remove carbon dioxide already emitted from our atmosphere. To leave the future of our forests in the hands of the same old usual suspects is to ensure the failure of California's landmark climate change strategy, and may thereby lead to the failure of our great state, society, and way of life. CARB and the State of California can and must be bolder, and must work to ensure that the imperative of the dollar and economics once again trumps the values of our greater society and the needs and rights of the majority of the people on our state.

Respectfully Submitted,

Rob DiPerna

California Forest and Wildlife Advocate

6206-ED, Pan

Environmental Protection Information Center (EPIC)

Attachments

Attachment A: EPIC Comments on Draft California Forest Carbon Plan. March 17, 2017.

Works Cited

Slauson, Keith M. 2012. Mesocarnivores as focal species for the restoration of post-logging aecond growth in the northern redwoods. In: Standiford, Richard B.; Weller, Theodore J.; Piirto, Douglas D.; Stuart, John D., tech. coords. Proceedings of coast redwood forests in a changing California: A symposium for scientists and managers. Gen. Tech. Rep. PSW-GTR-238. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture. pp. 437-447.

Van Pelt, Robert, et al., "Emergent crowns and light-use complementarity lead to global maximum biomass and leaf area in Sequoia sempervirens forests," Forest Ecology and Management, Vol. 375, pp. 279-308, 2016.

Letter 60



SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS 818 West 7th Street, 12th Floor Los Angeles, CA 90017 T: (213) 236-1800 F: (213) 236-1825 www.scag.ca.gov

REGIONAL COUNCIL OFFICERS

President Michele Martinez, Santa Ana

First Vice President Margaret E. Finlay, Duarte

Second Vice President Alan Wapner, Ontario

Immediate Past President Cheryl Viegas-Walker, El Centro

COMMITTEE CHAIRS

Executive/Administration Michele Martinez, Santa Ana

Community, Economic & Human Development Bill Jahn, Big Bear Lake

Energy & Environment Carmen Ramirez, Oxnard

Barbara Messina, Alhambra

April 6, 2017

Mary D. Nichols, Chair California Air Resources Board 1001 "I" Street Sacramento, CA 95814

RE: ARB 2030 Target Scoping Plan Update

Dear Ms. Nichols,

Thanks for the opportunity to review the Draft Scoping Plan Update to meet the 2030 target. We appreciate the outreach efforts of ARB staff including a one-hour briefing to the SCAG Joint Policy Committees on January 5, 2017 which helped to inform our local elected officials about the Scoping Plan.

Attached please see SCAG comments focusing on the following six key topics:

- The Limitation of Using Vehicle-Miles Traveled (VMT) Reduction to Reach Greenhouse Gas (GHG) Reduction Targets/Goals
- Need for Regional Equity in Cap-and-Trade Greenhouse Gas Reduction Funds (GGRF) Allocation Considering Regional Needs Particularly Disadvantaged Communities
- Comments on Appendix C (Vibrant communities and Landscape and Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles Traveled (VMT)) as related to implementation feasibility
- Integration of the State Implementation Plan Measures with the Scoping Plan
- Further Clarifying that the Community-wide GHG Reduction Goal is not a Requirement for Local Jurisdictions
- Preparing for Unintended Consequences from the Improvements in Vehicle Fuel Efficiency

SCAG's comments are aimed to looking for opportunities for synergies between the Scoping Plan, SCAG's RTP/SCS and Air Quality Management Plans/State Implementation Plans, highlighting constraints for increasing SB 375 targets and need for flexibility, and preparing for unintended consequences. Additional comments containing clarification and editing suggestions are also attached to help improve the document.

We look forward to the revised draft and please contact me if you have questions.

Sincerely,

Hasan Ikhrata Executive Director

ARB Draft 2030 Target Scoping Plan Update

SCAG Comments

April 6, 2017

1. The Limitation of Using VMT Reduction to Reach Climate Goals

On page 15, under Ongoing and Proposed Measures – Vibrant Communities and Landscapes/VMT Reduction Goal, it includes a goal of 15 percent reduction in total light duty VMT in 2050 referencing the Mobile Source Strategy. It should be noted that the 15% reduction is a statewide goal and not intended to be the sole responsibility by the MPOs through their respective RTPs/SCSs. At the ARB Board meeting on March 23, 2017, ARB staff's presentation also made it clear that the 15% VMT reduction is the joint responsibilities of the state and MPOs through their RTPs/SCSs. This point has also been clarified through the MPO/ARB consultation process with respect to the SB 375 target update, consistent with the language of the Draft Scoping Plan and Mobile Source Strategy.

With extensive bottom-up collaborative process with local jurisdictions and interested parties, SCAG's 2016 RTP/SCS is estimated to achieve an 18% per capita reduction in Greenhouse Gas (GHG) emissions in 2035, significantly exceeding the ARB target of 13%. However, even with the passage of Measure M in Los Angeles County in 2016, the region is unlikely to achieve further GHG reductions over the 18% level considering the significant improvements in vehicle fuel efficiency and the induced travel (i.e., rebound effects) by 2035. This finding is derived after undergoing extensive technical analysis in collaboration with the other large MPOs in the state.

As to the total VMT reductions from the respective baselines, SCAG's 2016 RTP/SCS shows an approximately 6% reduction in 2030 and 7% in 2040. Please note that 15% reduction goal in 2050 in the Draft Scoping Plan Update already includes SCAG's and other MPOs' adopted RTP/SCS in ARB's 2050 baseline, so an additional 15% reduction is needed statewide beyond MPOs' adopted RTP/SCS. This additional 15% reduction will be very difficult given that the Draft Scoping Plan Update calls for doubling the fuel efficiency, increasing to 49 miles/gallon in 2030 from today's 24 miles/gallon which will induce additional VMT since it will be cheaper to use a vehicle.

In summary, the Scoping Plan should include realistic expectations from the Transportation Sector associated with total light-duty VMT reduction.

(Please note that at the April 6, 2017 meeting, the SCAG Regional Council took action to approve SCAG's submittal to CARB of a recommended greenhouse gas (GHG) per capita reduction target for the region that is the same as the achievement in the 2016-2040

RTP/SCS — 18% in 2035. This recommendation would apply to the 2020 RTP/SCS and subsequent cycles of the SCS, and is conditioned upon a combination of actions or alternative equivalent measures further described below in the staff report (see Section entitled "SCAG'S TARGET RECOMMENDATIONS AND CONDITIONS"). For further details, please see item 2 via the link below:

http://www.scag.ca.gov/committees/CommitteeDocLibrary/rc040617fullagn.pdf.)

2. Need for Regional Equity in Cap-and-Trade/Greenhouse Gas Reduction Funds (GGRF) Allocation Considering Regional Needs Particularly Disadvantaged Communities

The Draft Scoping Plan expects the Cap-and Trade Program to achieve 25% to 40% of the total GHG reductions needed by 2030 (Page 58 Table III-1). The Cap-and-Trade auction proceeds have been used to support further GHG reduction efforts. However, up-to-date, there has been a regional disparity in Cap-and-Trade/GGRF Funding allocation. As a specific example, for the first two rounds of the Affordable Housing and Sustainable Communities (AHSC) Program funding, SCAG region has only received about a quarter of the total state funding while the region contains about a half of the state's population and two-thirds of the state's disadvantaged population pursuant to SB 535.

Comments on Appendix C (Vibrant communities and Landscape and Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles Travel (VMT))

The two White Papers in Appendix C mostly provided high level discussions of the various potential strategies and actions. However, further details are needed with respect to, for example, the following:

- What are the implementation feasibility and best practices of several suggested actions such as Growth Boundaries and establishing land conservation targets?
- For the VMT reduction strategies, how to identify and emphasize those that have the potential to yield the greatest benefits of GHG emission reduction and criteria pollutant reduction?

SCAG is encouraged by the recognition that pricing policies are integral to statewide efforts to meet GHG reduction goals and clearly believe that more can be done – both at the state level and locally – to facilitate further studies and demonstrations of pricing policies. SCAG is continuing to evaluate far reaching congestion pricing concepts, including strategic application of cordon pricing in the urban context, that are likely to have a profound impact on GHG reduction goals, local investment in new mobility options, while also serving as critical transportation demand management tools.

4. Integration of the State Implementation Plan Measures with the Scoping Plan

We appreciate ARB's effort to integrate multiple state planning efforts in the Proposed Scoping Plan Scenario, particularly the Mobile Source Strategy. We urge ARB to go further by integrating, prioritizing funding for, and accounting for the GHG reduction co-benefits of all significant measures in the air quality management plans/state implementation plans (AOMPs/SIPs) currently under development throughout the state, particularly the full scope of the "Further Deployment of Cleaner Technologies" measures in the 2016 South Coast AQMP. First of all, these SIP measures can yield substantial GHG reduction co-benefits as demonstrated in Table III-1. Ranges of Estimated GHG and Air Pollution Reductions by Policy or Measure in 2030 of the Draft Scoping Plan (p. 57), and also represent an excellent opportunity for ARB to strengthen the state GHG programs to support greater air quality cobenefit. Secondly, these SIP measures, once approved by U.S. EPA as anticipated, will be legally enforceable and required to be implemented. Therefore, the GHG reduction co-benefits from these SIP measures have greater degree of enforceability and certainty. In addition, the 2016 South Coast AQMP has identified the need to secure significant incentive funding to implement measures in the AOMP especially the "Further Deployment of Cleaner Technologies" measures. The integration and prioritization of these SIP measures in the Propose Scoping Plan can provide and prioritize available GHG program funds to fill the large gap of the incentive funding needed for both attainment demonstration and eventual attainment of the health-based national ambient air quality standards. It is critical for the South Coast region to be able to demonstrate attainment now and actually attain by the statutory deadlines in the near future. Otherwise, the South Coast region may face the dire consequences of potential highway sanctions and transportation conformity lapse that can impede the implementation of critical transportation projects in the vast region. Finally, Environmental Justice/Disadvantaged Communities in the severe or extreme non-attainment areas such as the South Coast are disproportionately burdened by heavy pollution from criteria pollutants. The integration and prioritization of the SIP measures can yield tangible co-benefits of health benefits by reducing criteria and toxic air pollution in the EJ/disadvantaged communities.

5. Further Clarifying that the Communitywide GHG Reduction Goal is not a Requirement for Local Jurisdictions

On page 134 of the Draft Scoping Plan, it states that "ARB recommends that local governments aim to achieve community-wide goal to achieve emissions of no more than six metric tons CO2e per capita by 2030 and no more than two metric tons CO2e per capita by 2050." Appendix B also provides examples of local actions that can support the State's climate goals. While the Draft Scoping Plan has not included any new measures as requirements for local jurisdictions to implement to meeting the 2030 GHG reduction targets, it would be helpful for ARB to state explicitly that the communitywide goal is not a requirement for local jurisdictions.

Instead, a communitywide goal should be one of the many ways for the state to support local jurisdictions along with funding, regulatory incentives, technical assistance and other resources, to contribute to the statewide climate goals.

In addition, to meet the SB 32 and Executive Order (S-3-05) requirements for 2030 and 2050 respectively, both 2030 and 2050 should have maximum allowable GHG emissions. Therefore, given the projected statewide population, a statewide goal of GHG emission per capita could be estimated in 2030 and 2050. However, it should be noted that different local jurisdictions may be in different climate zones, have different industry mix, development patterns and public transit availability, accordingly a single numerical GHG emission level per capita for 2030 or 2050 may not be appropriate for all local jurisdictions. The climate goal for a given community should be achievable given its specific conditions. ARB and other state agencies should also be clearly aware of the significant local differences with respect to achieving a constant GHG reduction goal in implementing their respective programs.

6. Preparing for Unintended Consequences from the Improvements in Vehicle Fuel Efficiency

The Draft Scoping Plan Update calls for doubling the fuel efficiency, increasing from today's 24 miles/gallon to 49 miles/gallon in 2030. In addition, the Scoping Plan also includes an accelerated deployment of zero-emission vehicles to 4.3 million by 2030. Since the gasoline excise tax has been the primary source of state and federal funding for transportation investments, the Proposed Scoping Plan should also recognize that significant improvements in fuel efficiency including the accelerated deployment of zero-emission vehicles would adversely impact already insufficient transportation revenue sources. SCAG has advocated for more than a decade for the transition from a fuel-based tax to a mileage-based user fee among other strategies to establish a user fee based system that better reflects the true cost of transportation. State leadership and collaboration with local and regional partners on the implementation of road charges to fund transportation is critical. Such strategies provide the most promise for reducing VMT and associated GHG emissions.

H	Chapter/Appendix	Page	Scoping Plan Language	Comments
1	Natural Environment and Working Lands	General		Conservation incentives, carbon sequestration methods, and economic impacts for working lands are very different from natural/habitat lands. There should be a more specific approach for farmland conservation, most importantly strategies and incentives to ensure stewardship or for farmers and ranchers to use the most efficient techniques for GHG sequestration. Since some farmlands/ranchlands contribute to GHG emissions, it would be helpful to see a two-tiered strategic approach: 1. Outline strategies to cut emissions on working lands, and 2. Outline strategies for sequestration on working lands. Currently, the plan is vague on these strategies.
2	Natural Environment and Working Lands	General		There could be a disproportionate cost burden placed on smaller independent farms to reduce emissions or sequester carbon. Therefore, language and strategies should be added that differentiate between large-scale industrial/factory farming and smaller, independent farms. Attention should be paid to what climate-smart agricultural techniques may be financially or otherwise onerous to small farms, especially in disadvantaged areas.
3	Natural Environment and Working Lands	General		Protecting and restoring biodiverisity is a critical aspect of a robust climate strategy, and should be paid stronger attention in the plan. A considerable number of high-biodiversity habitats that play a key role in ecosystem functioning are adjacent to urban and suburban communities, and largely do not have protected status. These habitats should be prioritized for conservation, especially in hillsides or riparian areas. Natural lands connectivity and wildlife corridor conservation should also be highly prioritized. Programs should be included that avoid a piecemeal approach to conservation that could disrupt habitat connectivity and species migration patterns. Consideration should be paid to linkages that 1) a reserve network that harbors the greatest climatic diversity will allow for greater adaptation and 2) maintaining species access to cooler climates as temperatures rise.
4	Natural Environment and Working Lands	General		Because natural landscapes transcend political boundaries, strategies that conserve and maintain natural lands on a regional level should be prioritized. Conservation agreements between cities, counties, and tribes should be encouraged. Regional Conservation Plans, Multiple Species Habitat Plans, and Natural Communities Conservation Plan/Habitat Conservation Plans are strategies that could be improved upon or expanded to reach conservation goals.
5	II. The Proposed Scenario	35	additional VMT reduction strategies not specified in the	"Potential VMT Reduction Strategies for Discussion" (Appendix C) was first presented during the proposed Scoping Plan process as potential strategies yet they are now being referred to in Table II-1 on pg. 35 as a path to further VMT reductions. Please clarify if Appendix C has become the defacto menu of VMT reduction measures or are these still just potential strategies as stated in the original document?
6	Section C. Transportation Sustainability	100	In fact, transport-related physical activity could result in reducing risks from chronic diseases	We suggest that the text should be revised to state, "Studies indicate" instead of "In fact," since these studies use models.

#	Chapter/Appendix	Page	Scoping Plan Language	Comments
7	Section C. Transportation Sustainability	102	Quadruple the proportion of trips taken by foot by 2030 (from a baseline of the 2010–2012 California Household Travel Survey). Strive for a nine-fold increase in the proportion of trips taken by bicycle by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).	We believe that a quadrupling of the proportion of trips taken by foot would be dramatic and potentially unrealistic. Walk mode share accounted for 10.7% of trips in 2010-2012. Quadrupuling the proportion of trips would result in 42.8% increase by 2030, with a walk score of 14.4%. A 9-fold increase in the bicycle trips would mean a 1.6% mode share in 2010-2012 would result in a 14.4% mode share in 2030. This increase in bicycle trips appears to be more reasonable when compared to the walk trips, but the goals still appear to be lofty and aggressive. Overall, a change of this magnitude would require a major shift in land use and current transportation patterns. It would require a good portion of the trips be achievable within a 1-2 mile distance for walking. These goals might be achievable, if the State's work culture supports a largely telecommuting work environment and/or we saw major shifts in land use in suburban communities which strengthen their economic core to provide more jobs and housing. We also suggest that ARB clarify if the increase in walking trips is directly correlated with the assumption that public transit ridership would substantially increase. If so, please clarify if the walking trips are double counted as transit ridership would result in an average of two walking trips.
8	Section C. Transportation Sustainability	102	Continue research and development on transportation system infrastructure, including: o Integrate frameworks for lifecycle analysis of GHG emissions with life-cycle costs for pavement and large infrastructure projects, and o Health benefits and costs savings from shifting from driving to walking, bicycling, and transit use.	We suggest to add a third bullet to this section: Improve statewide data sets to integrate big data, improve data collection for active transportation, and investments in regional modeling capacity to provide information on the VMT reduction opportunities from proposed land use and transportation investments and programs.
9	Section C. Transportation Sustainability	102	Health benefits and costs savings from shifting from driving to walking, bicycling, and transit use.	We support this statement and would also support research into the economic benefits for providing affordable housing.
10	Section C. Transportation Sustainability	103	Strive, in passenger rail hubs, for a transit mode share of between 10 percent and 50 percent and for a walk and bike mode share of between 10 percent and 15 percent.	Please clarify as to what constitutes a "passenger rail hub" and whether this would include, for example, any inter-city passenger rail (Amtrak) or high-speed rail station, or whether a number of connecting passenger rail, commuter rail, and/or urban rail services are required. It is unclear whether the mode shares would apply only to trips terminating at or originating from the passenger rail station (ie., trips transferring to or from the passenger rail service) or whether this includes all trips occurring within an unspecified boundary of the passenger rail station. It is unclear how the range of 10 percent to 50 percent was determined or whether this takes into account existing mode shares.
11,	Section C. Transportation Sustainability	106	Implement the Cleaner Technology and Fuels Scenario of CARB's Mobile Source Strategy, which includes: o 4.3 million zero emission and plug-in hybrid light-duty electric vehicles by 2030	The number of zero emissions vehicles forecasted appears to be inconsistent throughout the document. Please clarify if the total number of forcecasted zero emissions vehicle is 4.2 million or 4.3 million.
12	IV. Key Sectors	108	"Promoting stronger boundaries to suburban growth through enhanced support for sprawl containment mechanisms such as urban growth boundaries and transfer of development rights programs"	Please clarify if this statement will be supported with the full willingness and support from local land use authorities.
13	Natural Environment and Working Lands	109	"Promoting stronger boundaries to suburban growth"	Change to "Minimize impacts of suburban growth though incentives for greenfield preservation and transfer of development rights programs."
14	Natural Environment and Working Lands	110	"Landowner, local, and regional decisions related to land use impact development patterns and associated natural and working land conversion rates; conversely conservation activities can support infill-oriented regional development and related transportation needs."	This sentence seems confusing, and might be interpreted as accusatory towards landowner, local and regional development decisions.

H	Chapter/Appendix	Page	Scoping Plan Language	Comments
15	Natural Environment and Working Lands	111	Senate Bill 1383 and the resultant Proposed SLCP Reduction Strategy identify a mix of voluntary, incentive-based, and potential regulatory actions to achieve significant emissions reductions from these sources. A variety of techniques will be employed to attain the best results for each specific farming operation, and effectively implementing a broad mix of strategies will reduce the GHG emissions from the agricultural sector significantly.	How will voluntary practices for agricultural land be incentivized? Will there be any policies to incentivize farmers to preserve actively farmed land, thereby discouraging conversion to more resource intensive land uses with higher GHG emissions? A great portion of agricultural land in the SCAG region is in economically disadvantaged areas, and balancing preservation and growth priorities is an ongoing challengeWhat strategies will be considered to protect farmland in areas where there may be a lack of resources or political support for conservation?
16	Natural Environment and Working Lands	116	Promote and provide incentives for infill development through community revitalization and urban greening and support for permanent and temporary voluntary conservation of lands under threat of development, paired with stewardship plans where possible.	Potential incentives should be specified.
17	Natural Environment and Working Lands	116	Promote the adoption of regional transportation and development plans, such as SB 375 Sustainable Communities Strategies and Climate Action Plans that prioritize infill and compact development and also consider the climate change impacts ofland use and management.	We believe that this statement is vague. How will the state promote the adoption of these plans? Will resources be provided to ensure jurisdictions can initiate, adopt and implement strategies that prioritize infill and compact development in partnership with other complementary strategies?
18	Natural Environment and Working Lands	116	Provide support and technical assistance for counties, cities, and regions to integrate natural and working lands conservation priorities into plans, drawing from existing Natural Community Conservation Plans, Habitat Conservation Plans, the State Wildlife Action Plan, and critical agricultural lands.	We believe that this statement needs further clarification. Would "critical agricultural lands" be part of the plan?
19	Section E. Waste Management	119	and renewable natural gas has the potential to reduce	We agree that biofuel can produce less emissions when compared to fossil fuels. However, the effects from land use change have the potential to cause even more emissions than what would be caused by using fossil fuels alone. Would organic waste diversion and fuel conversion occur by diverting material to a near by facility; or would the breakdown occur on-site within the land fills?
20	Section E. Waste Management	124	Developing programmatic Environmental Impact Reports (EIRs) and model permit and guidance documents to assist in environmental review and CEQA for new facilities.	We believe that this statement needs further clarification. Please clarify if developing PEIRs would assist in tiering. For example, if Calrecycle developed a PEIR, could a landfill project tier off the PEIR? Or would the PEIR be developed to evaluate the environmental impact of a plan or policy? Additionally, please provide clarification as to the purpose of model permits and guidance documents. Would agencies integrate them as best management practices and/or mitigation measures, within their EIRs?
21	Implementing the Proposed Plan	137	Table VI: Climate Change Policies and Measures: By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink	We suggest that the Department of Agriculture be included as a lead agency along with the CNRA. A lot of indespensible knowledge and technical expertise will be missing from strategies if agricultural experts are not included.
22	EJAC recommendations	3	New projects must not create adverse impacts like displacement of existing residents.	Current State statute requires that projects that result in the removal of affordable housing units must replace the housing units. It is unclear if the intention here is for the requirement of non-displacement and if it is strictly intended for disadvantaged communities.
23	EJAC recommendations	4	Do not create new infrastructure that relies on fossil fuels, including natural gas, fracking, pipeline development, crude oil shipments and processing	We suggest the language be revised to state that we should minimize new infrastructure that rely on fossil fuels but should not completely avoid due to larger costs and efficiency

Appendix A – Comment Letters

#	Chapter/Appendix	Page	Scoping Plan Language	Comments
24	EJAC recommendations	9	serve entire disadvantaged communities, rather than instrincipal disadvantaged communities, rather than	It is our opinion that benefits to individual families can still benefit the entire community and focusing on the entire community may result in a scenario where efficiency is not achieved
25	EJAC recommendations	24	Greenhouse Gas Reduction Fund projects must be transformative for disadvantaged communities, in ways defined by each community themselves	We agree that Greenhouse Gas Reduction Fund Projects are good for encouraging community-specific needs. However, some projects that are otherwise beneficial may not meet certain community requirements while meeting them in other communities.

Comment Log Display

https://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname = scopingp...



Letter 68

Comment Log Display

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.

COMMENT 68 FOR SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET AND DRAFT ENVIRONMENTAL ANALYSIS (SCOPINGPLAN2030) - NON-REG.

First Name: Todd Last Name: Shuman

Email Address: tshublu@yahoo.com

Affiliation: Wasteful Unreasonable Methane Uprising

Subject: WUMU Comment on 2017 Climate Change Scoping Update

Comment:

Comments of Todd Shuman, Wasteful Unreasonable Methane Uprising, April 7, 2017

- A. Appendix E in the current CA ARB Scoping document does not model a Cap and Tax approach. It just refers to the modeling for Alternative 1 to provide insight into how a Cap and Tax approach might function and impact emission reductions and overall state economic activity. This failure to fully model a Cap and Tax approach constitutes a CA ARB failure to comply with CEQA.
- B. CA ARB fails to explore the conditions under which a Cap and Tax system could minimize leakage and economic relocation. A fully-compliant CEQA ARB analysis needs to explore and input a variety of assumptions and scenarios and then model them to generate a range of possible results based on the varying assumptions and scenarios. CA ARB should also have explicitly explored conditions in which Darien Shanske's "formulary apportionment" approach (which I previously submitted to CA ARB and which I again submit to CA ARB) is incorporated into the carbon tax and cap and tax alternative modelling. Failure to do so constitutes CEQA non-compliance.
- C. CA ARB's comparative analyses between the recommended proposal (mostly a supplemented Cap and Trade system) and the carbon tax alternative remains biased against the carbon tax concept. Wara and Cullenward have repeatedly critiqued CA ARB in previously submitted comments concerning this matter, and the most recent CA ARB document does not appear to address such critique, especially with regard to the "quantity certainty" issue which is fundamentally

68-1

1 of 3 4/27/2017 11:32 AM

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A - Comment Letters

Comment Log Display

https://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=scopingp...

related to the "unlimited allowance banking" that would still be allowed during the 2020-2030 period under the current preferred ARB proposal. As a result, the CA ARB analysis currently remains slanted and biased against both the carbon-tax-only alternative and the cap-and-carbon-tax alternatives. Such bias constitutes CEQA non-compliance.

D. The "social cost of carbon" values used in Appendix E are taken from EPA. These EPA values are very low relative to a more comprehensive social/environmental cost of carbon dioxide/ton presented in Dr. Drew Shindell's "The Social Cost of Atmospheric Release", 2015 (\$46/ton versus \$110/ton, CO2.) The use of such a low social cost of carbon (in terms of CO2 tonnage) severely distorts the ARB analysis and renders it in non-compliance with CEQA. [See "The social cost of atmospheric release", Drew T. Shindell, Climatic Change (2015) 130:313-326, DOI 10.1007/s10584-015-1343-0, page 319, Table 2, Median total; declining rate.

E. Finally, CA ARB fails to reference and discuss a recent study concerning leakage that is likely relevant to the different alternatives. The study and its findings are discussed below. (See http://legal-planet.org/2016/05/30/the-economic-impact-of-ab-32-on-california/Dan Farber[the Sho Sato Professor of Law at the UC Berkeley School of Law and Co-Director of the Center for Law, Energy & the Environment] wrote this observation about the May 30, 2016 Resources for the Future study: "[0]verall, the economic impact seems small. That's also important because it means that carbon leakage from production shifting is also probably small.")

Sincerely,

Todd Shuman, Camarillo, WUMU, http://wumu-wuru.my-free.website

[*Wara/Cullenward note that "unlimited allowance banking" in cap in trade systems typically results in emissions reduction "overcompliance" early on (when compliance costs are lower) and emissions reduction "undercompliance" later on (when compliance costs are higher, relative to the earlier phase of a typically decadal compliance period.)]

Attachment: www.arb.ca.gov/lists/com-attach/87-scopingplan2030-VTMAaQN3ByYBcwNr.pdf

Original File Name: Fourth Carbon Tax Column FINAL.pdf

Date and Time Comment Was Submitted: 2017-04-07 14:50:29

2 of 3 4/27/2017 11:32 AM

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A - Comment Letters

Comment Log Display

https://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname = scopingp...

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

3 of 3

Letter 69



California Independent Oil Marketers Association 3835 North Freeway Blvd., Suite 240 Sacramento, CA 95834-1955 916.646.5999

April 3, 2017

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: CIOMA Comments on ARB's 2030 Scoping Plan

The California Independent Oil Marketers Association (CIOMA) represents about 300 members, including nearly 90% of all the independent petroleum marketers in the state and about one quarter of the state's 10,000 service stations. Our members provide services to local governments, law enforcement, city and county fire departments, ambulances/emergency vehicles, school district bus fleets, construction firms, marinas, public and private transit companies, hospital emergency generators, trucking fleets, independent fuel retailers (small chains and mom-and-pop gas stations) and California agriculture, among others. CIOMA appreciates ARB's consideration of our comments on the 2030 Scoping Plan.

CIOMA believes the best path to achieve the state's long-range environmental goals is through an integrated and flexible policy framework that optimizes technologically feasible, cost-effective, and sustainable greenhouse gas (GHG) emissions reductions in all programs and sectors.

Cap-and-Trade

CIOMA believes that the most comprehensive and effective scenario alternative the ARB staff has developed is Alternative 3 – All Cap-and-Trade. We urge the Air Resources Board to adopt this alternative to the "Proposed Scoping Plan" as it allows a truly market based solution that will help California achieve its GHG goals, in conjunction with the existing Low Carbon Fuel Standard and the Renewable Portfolio Standard.

We consider Cap-and-Trade to be an effective scenario, however we believe it is being relied upon far too much as a funding mechanism for other programs. Due to its declining revenues, it seems imprudent for California Air Resources Board's (CARB) 2030 Scoping Plan (Scoping Plan) to project increasing spending from revenue generated by the cap-and-trade program from greenhouse gas (GHG) emission reductions, as well as increased funding for other programs.

At a time when California continually postures to be at odds with the federal government, there is a dangerous potential for ARB to attempt to go beyond its statutory authority, as defined in 42 U.S. Code § 7543 Section 209(a). to be able to proclaim success for under-performing or under-funded programs by attempting to extend the program to commercial and passenger mobile sources.

Increasing consumer costs and regulation is not the answer to programs that currently lack funding mechanisms or realistic reduction goals. If a market based solution is artificially affected by constant intervention, restriction, redesign, or reallocations, the solution becomes nothing more than command and control with an expensive, confusing, ineffective, and overall flawed implementation.

By picking winners and losers, CARB defeats the market-based solution created by cap-and-trade. When the government intervenes, stakeholders lose faith in the program and the enforcing agency. Even today's chosen winners become disenfranchised when the next winner is chosen and their investments and hard work are cast aside in order to reach the next deadline. This leaves companies, and communities, stranded with high sunk costs, infrastructure too specific to adapt to the new en vogue choice, and many employed in an industry deemed no longer viable by an obscure process.

Funding Mechanism Shortcomings

The Scoping Plan relies on programs, such as Mobile Source Strategy, that lack not only funding mechanisms but also estimated costs through 2030. Nearly half of the 13 plans do not have "Total Cost of Control through 2030" available. Its goal is to put 4.2 million zero-emission vehicles (ZEV) on the road at an estimated cost of \$41.5 Billion dollars (Revised 2016 SIP Strategy). A \$10,000 cost per ZEV of tax payer money is a ridiculously high price point for the average Californian to have to bear. The 2030 Scoping Plan is premature for implementation if this is the exceptionally high cost that Californians must pay. Further, historically these programs have run over budget and the Mobile Source Strategy appears to be no different. When the money for this program will need to be provided to BEVs in the short term and FCVs in the future, with little mention of planning for infrastructure adaptability or construction beyond "...there will be some costs associated..." (Economic Impact Analysis, Mobile Source Strategy pg. 15). We ask that ARB either completes these economic impact analyses or provides a guarantee that regulations will not be added or changed in order to fund these programs prior to the approval and implementation of the 2030 Scoping Plan.

Effect on CA Economy and Growth

The Executive Summary makes the proposed Scoping Plan out to be a boon for California's economy and employment rate but when examining the environmental and economic analyses, this may not be entirely accurate.

The Executive Summary claims "Overall, under the Proposed Plan the California economy is anticipated to grow \$3.4 trillion, roughly one-half percent less growth by that date when compared to a scenario where we did nothing at all". As with most of the economic impact analyses provided with ARB strategies, there is a large focus on an intangible benefit and little mention of direct costs to consumers, businesses, and the economy of California. In most of these analyses, there is not a single dollar value attached to the costs. It is difficult to estimate costs 20 years in the future due to renewable energy industries that have yet to come to fruition, technology that is still in the early stages of deployment if not development, and other lurking externalities. However, the optimism applied to projecting California's economic growth and emissions reduction is applied too freely in a state with crumbling infrastructure, a housing crisis that cannot be solved due to building restrictions, and the highest poverty level in the nation. When combined with our steadily climbing cost of living, these budgetary and humanitarian constraints are not appropriately addressed in the modeling of economic and job growth.

The Environmental Analysis (Appendix F, 168) states, "As discussed, effects on the California economy are anticipated to be modest, and would not result in substantial economic growth. Thus, no substantial growth-inducing effects would occur as a result of implementation of the Proposed Plan." This directly conflicts with what is stated in the Executive Summary in two locations: "significant opportunity for California investors and businesses". The Proposed Plan cannot be both a significant opportunity for businesses and investors and provide no substantial growth-inducing effects".

Again, the Environmental Analysis provides a less optimistic look into the expected impacts of the Proposed Plan when discussing employment. "While some sectors of the economy could see job growth, particularly in the clean energy sector as a result of implementation of measures in the Proposed Plan, this would not result in substantial increases in employment opportunities or otherwise induce substantial population growth in the State." (Appendix F, 138). This tricky language contradicts itself in the same sentence. There cannot be possible "job growth" if, in your own words, you state "this would NOT result in substantial increases in employment opportunities." The economy and working families of California are being lead down a road to fewer jobs in the state, as stated in CARB's own words.

Since the state seeks to double our GHG emissions reductions, robust and regular oversight and informational hearings must accompany any post-2020 climate program. We believe ARB or a third party should, at a minimum, review each current regulation resulting from AB 32 and determine if, (1) the regulation has accomplished the intended objectives or, (2) if the regulation has failed to achieve its goal and may simply have placed undue burdens on California's businesses and consumers without reducing our GHG emissions levels.

Stakeholder input and providing a true "seat at the table" for California's business community will be extremely important in reaching the 2030 goals while maintaining our state's history of economic growth and leadership. In lieu of an Industrial Advisory Board, the ARB should consider the appointment of an Industrial Representative to the Board. This would enhance the Board's expertise and provide additional depth to the Board's knowledge base.

Since Governor Pat Brown, California has worked to avoid an environmental versus business impasse; we need to ensure all needs are being met in a balanced manner to achieve the highest policy and environmental integrity. ARB and stakeholders all have a stake in the integrity and the success of the program.

Biofuel and Ethanol Assumptions

Missing from the Scoping Plan is a sufficient acknowledgement of the difficulties in transitioning to biofuel and ethanol. All storage, production, and transfer equipment will need to be updated in order to be fully compatible with more corrosive fuels, such as ethanol or increased blends of ethanol or biofuels. The need to test and replace this equipment for a variety of biofuel and ethanol blends will put a large burden on fuel locations and service stations, not to mention the companies that deliver fuel. CIOMA's member companies that help keep California's economy running are small businesses that will struggle to be able to update their equipment to ensure compatibility with the mandated low carbon fuels. One highly likely outcome of the strategy contained within the 2030 Scoping Plan is the reduction in the number of companies able to survive and serve California residents, therein creating fewer and bigger companies to continue to serve the market demand within our state.

69-1

We ask that a more complete plan is considered and put forward to ensure California's workforce is able to access the fuels they need in order to live their lives and small businesses are able to keep their doors open. Unfortunately, the 2030 Scoping Plan does not meet the level of review to be considered complete in its analysis.

Conclusion

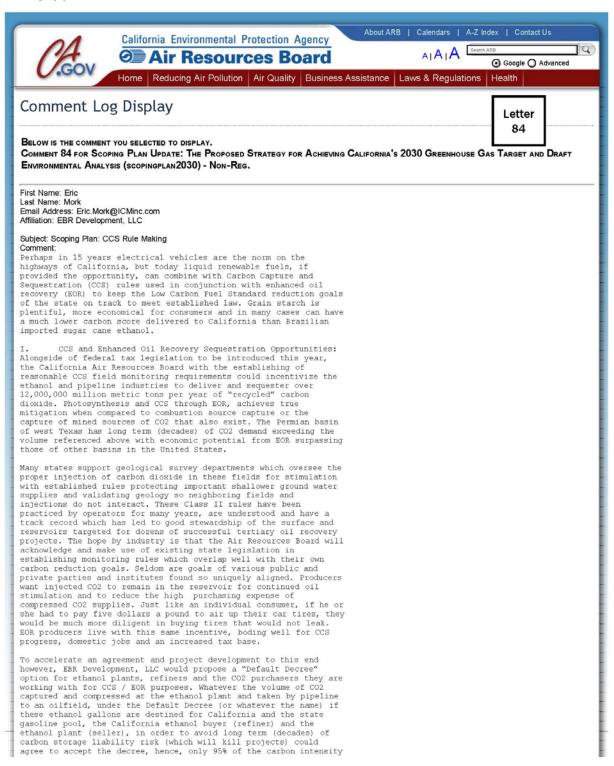
The amount of missing information and lack of thorough investigation of downstream effects in the various strategies shows an incomplete assessment of ARB's own vision of how to decrease GHG emissions. It would appear that exhaustive and thorough planning has been sacrificed in order to rush the implementation of the Scoping Plan. We ask that ARB take the necessary time to fully address the issues we have mentioned in these comments.

The issues are included below for convenience:

- A true market based solution in cap-and-trade without continued government interference, to allow the competition and flexibility necessary for the program to work
- · Fully developed, described, and publicly available funding mechanisms
- Greater evaluation of stakeholder input to determine the effects on California's economy and workforce
- Transparency and tracking guarantees to ensure the proper use of taxpayer money
- Plans to help the small businesses of California obtain the necessary equipment to be compatible
 with biofuel and ethanol, and the changing landscape of fuels in the state.

Thank you for the opportunity to submit these comments and we look forward to your response. Please contact Samuel Bayless at bayless@cioma.com or (916) 646-5999 with any questions.

Comment Log Display



 $https://www.arb.ca.gov/lispub/comm/bccom disp.php?listname=scopingplan2030\&comment_num=103\&virt_num=84[4/18/2017~4:05:23~PM]$

Comment Log Display

(CI) reduction as measured with GREET for the ethanol plant would inure to the refiner's California carbon mitigation obligation. For the EOR producer, this would enable them to stay free of additional monitoring requirements beyond Class II state rules. The California obligated refiner could have access to lower CI ethanol gallons (due to ethanol plant CO2 now being sequestered) but would now be required, based on the quarterly average for carbon prices in California, to pay this unrealized 5% CO2 captured volume, multiplied by the quarterly price for carbon into a newly established Environmental Justice (EJ) research fund. This fund would be managed by ARB with resources dedicated to research and perhaps direct project investment targeting emission issues and concerns in the state. If 1.5 billion gallons per year of the ethanol headed to California were associated CO2 pipeline connected gallons, using \$100/mT for carbon, this 5% decree deferment would create around \$11,000,000 each year for this EJ fund and more with higher blends of ethanol discussed below. If a 25 CI point reduction occurs with CO2 capture, then the carbon dollar value of 1.25 points per gallon would go to the EJ fund as the refiner obligation at the same time providing ethanol gallons which continue to be of decreasing carbon scores allowing the refiners continuation of fuel sales in the state within LCFS rules. PART I Summary: A) Do not recreate the rules for injection, recycling and monitoring sequestration in EOR projects without providing a mechanism to leverage today's successful approaches. Studies indicate that well over 99% of injected CO2 in these projects stays sequestered. The default decree choice is the avenue to avoid the bureaucratic inertia that appears inevitable without such an option. The goal should be to create an incentive environment for environmental progress, but there is risk in the opposite occurring with the rule making taking place. Just as the ARB is looking decades ahead, EOR project duration will be decades long as well, so while price assumptions for forecasting
is large, risk mitigation and liability assessment loom equally large and should be considerations of ARB in current rule making. B) CO2 from ethanol plants with the photosynthesis advantage discussed are truly differentiated from others in this evaluation. Much like when baking bread, yeast are eating carbohydrates and releasing the CO2, it is just not in the oven making bread rise. The alcohol from these yeast is captured to create octane (113) for energy. The story could be further enhanced with true
atmospheric mitigation by closing the loop on this other product of good yeast. Again, clearly
differentiating this source from that which is mined (drilled for) or others which are typically subsets of a combustion activity is not unfair. C) Representatives of thirty two ethanol plants to date have had preliminary conversations with EBR Development, LLC and depending on final rules, have expressed interest in CO2 compression equipment being installed in conjunction with a pipeline to transport this supply seamlessly into the oilfield for enhanced oil recovery and sequestration. The final ARB CCS rulemaking activities will determine the viability or need to continue these discussions. Requirements to Reduce NOx in California: The Fifth Circuit Court of Appeals ruled last month that the Air Resources Board must find avenues to reduce nitrous oxide emissions. While much of the focus here was on biodiesel, the ethanol industry could be an avenue to a solution while complementary to section I above. Aromatics such as toluene, benzene and xylene boost gasoline octane but are key concerns for both tailpipe and evaporative 84-1 Take a look https://www.voutube.com/watch?v=sg6sZg8Sefk and https://www.youtube.com/watch?v=MwbO2clwdxg links. The attached article from Ethanol Across America indicates that aromatics are three times more reactive to forming ozone. This could be reduced with higher blends of ethanol beyond the 10%

 $https://www.arb.ca.gov/lispub/comm/bccom disp.php?listname=scopingplan2030\&comment_num=103\&virt_num=84[4/18/2017~4:05:23~PM]$

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A – Comment Letters

84-1

cont

Comment Log Display

included in gasoline today. Higher compression engines entering the market are prime candidates to capture power and mpg for the consumer from this cleaner burning, high octane fuel.

Also discussed is the decrease in Reid Vapor Pressure (RVP) as ethanol concentrations increase. Allowing higher blends of ethanol along with the pipeline discussed above would make more low carbon

ethanol carry additional benefit in meeting the mandated lowering of carbon in California fuel. NOx reduction also occurs making higher blends of ethanol one solution to the relief sought be the court in Poet vs. CARB LCFs, all while potentially increasing California emission research dollars through infrastructure i.e.: pipelines for EOR.

III. Fiber Conversion to Ethanol: Carbon Excellence Gen $1.5^{\rm m}$: Incremental ethanol gallons will soon be created by converting low value corn fiber into fuel. Exciting in that these are existing bushels the ethanol plant is processing today, yet adding $6.9^{\rm m}$ titled with adding 6-9% vields with

carbon intensity scoring per gallon of 15-25 g CO2 e/MJ. Coupling these incremental gallons with the CCS strategy discussed above could generate ethanol gallons with a carbon intensity score of close to "0" g CO2 e/MJ if a plant is pipeline connected to the oilfield and given credit for sequestration for the CO2 produced and is also converting their fiber to fuel. Rulemaking will dictate the notential

scoring contribution this combination could provide to the low carbon fuel needs of California. Additional low carbon gallons that can go into California from plants that are pipeline connected can create EJ

neip crease so fund dollars annually should the markets and producer opt into the default decree through the mechanism discussed.

A tangential benefit also occurs with this fiber separation and conversion process. Today, biodiesel makes and important

contribution to progress made to achieving the goals of the LCFS. It was reported in 2015 that 1/3 of the biodiesel sold in California was produced using crude corn oil. The Gen 1.5" process in addition to accessing and creating fuel from fiber also frees up bound up oil which can lead to additional

biodiesel production if needed. Though under review as mentioned, biodiesel typically is a good scoring fuel under the GREET model and more could be produced through lengthening the crude corn oil market.

"To get what you want, be willing to help enough other people get what they want." Zig Ziglar said this years ago, but I think for success to occur with CCS rule making and this Scoping Plan discussion, this attitude should be at the for front for all. Agendas of all parties should be kept clear so time is not wasted, which means candor should win the day. I tried to be concise and grow the needs of both state and industry with the approach above. This would be a \$2 B investment to achieve. Plenty of private investment money is available today for good projects, but defining the rules for a forth coming 20 year period can be tough, so my council to the Air Resources Board would be put yourself in the shoes of the investor and strive for clarity and a realistic rule making outcome that will be stimulative to reaching your goals, not inhibitive.

Original File Name:

Date and Time Comment Was Submitted: 2017-04-10 09:13:04

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

Back to Top | All ARB Contacts | A-Z Index

Decisions Pending and Opportunities for Public Participation

https://www.arb.ca.gov/lispub/comm/bccom/disp.php?listname=scopingplan2030&comment_num=103&virt_num=84[4/18/2017 4:05:23 PM]

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A - Comment Letters

Comment Log Display

Conditions of Use | Privacy Policy | Accessibility | Bilingual Services Complaints | Civil Rights Policy How to Request Public Records

The Board is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency.

Cal/EPA | ARB | CalRecycle | DPR | DTSC | OEHHA | SWRCB

 $https://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=scopingplan2030\&comment_num=103\&virt_num=84[4/18/2017\ 4:05:23\ PM]$



April 6, 2017

Letter 85

Mary D. Nichols Chair, California Air Resources Board Sacramento, CA

Subject: Proposed 2017 Climate Change Scoping Plan Update and Fuel Efficient Passenger Vehicle Replacement Tires

Dear Chair Nichols:

Thank you for the opportunity to provide comments on the proposed 2017 Climate Change Scoping Plan Update (Scoping Plan Update). Energy Solutions is a professional and engineering services firm whose mission is to create large-scale environmental impacts by providing market-based, cost-effective energy, carbon, and water management solutions to our utility, government and commercial customers. We strongly support the innovative and critical leadership from the Air Resources Board (ARB) in reducing greenhouse gas (GHG) emissions in California.

We recommend adding fuel-efficient passenger vehicle replacement tires to the list of transportation measures and to the Appendix F Environmental Analysis. Replacement tires offered on the market typically lead to a four percent increase in GHG and other emissions compared to tires fitted on new vehicles. Using baseline emissions from CARB's EMFAC2014 model, fuel efficient replacement tires will reduce GHG by more than two million metric tons per year through 2030. This quantity of GHG is cumulatively equal to more than 15% of the proposed cumulative reductions from additional transportation measures, including refineries, through 2030.

Fortunately, ARB has found that "fuel efficient passenger vehicle tires can be utilized by both new and in-use vehicles in the near-term to achieve GHG emission reductions. Deployment of fuel efficient vehicle tires for in-use vehicles could include limited incentives, followed by ratings and then standard setting to permanently shift the market" (May 2014 First Update to the Climate Change Scoping Plan).

We strongly agree. A study for the South Coast Air Quality Management District finds that disadvantaged communities where vehicles operating on replacement tires are more common will particularly benefit from air quality and economic benefits. Based on that study, drivers will save up to \$1000 in fuel costs over the lifetime of their vehicle.³

We recommend the following addition to section IV.C of the proposed Scoping Plan Update:

"Persistent market barriers such as the lack of customer information and standards have led to a significant efficiency gap between tires shipped with *new* light duty vehicles and tires

449 15th Street, Oakland, CA 94612 510 482 4420 www.energy-solution.com

85-1

¹ http://energy-solution.com/wp-content/uploads/2015/01/Passenger-Vehicle-Replacement-Tire-Efficiency-Study.pdf. Research sponsored by the National Academy of Sciences, California Energy Commission, CARB, and California Environmental Protection Agency and US Environmental Protection Agency have confirmed this gap.
² The proposed plan calls for a 27 to 32 million metric ton per year reduction of carbon dioxide in the transportation sector (page 43). Baseline emissions in 2030 are projected at 78.9 million tons per year from https://emissions.pdf. Data data downloaded March 22, 2017 for LDA, LDT1 and LDT2 categories. A 4% improvement in vehicles using replacement tires will achieve greater than two million metric tons per year of GHG through 2030. Total transportation cumulative GHG emissions of 122 million metric tons are shown in proposed Scoping Plan Update Figure II-2.

³ https://energy-solution.com/wp-content/uploads/2016/06/Tires_Cutsheet.pdf. Savings will depend on fuel prices.

available in the *replacement* market. A study for South Coast AQMD estimates that a 4% average vehicle fuel efficiency improvement can be achieved through improved efficiency of replacement tires, resulting in very cost-effective air quality and GHG benefits and major consumer benefits. This study is also consistent with research for ARB and CalEPA, an earlier study by the National Research Council, and research demonstrating the effectiveness of the European Union (EU) program in closing this gap. 5

The resulting air quality and economic benefits are especially important for lower income and disadvantaged communities where older, higher emitting vehicles that use replacement tires are more prevalent. The prior 2014 Scoping Plan Update highlights policies such as incentives, consumer information and standards to overcome persistent market barriers to fuel efficient replacement tires and unlock these benefits.

While the federal government has not implemented a program to improve the rolling resistance of light duty vehicle replacement tires, California has a timely opportunity to move forward and achieve the replacement tire efficiency goals in AB 844 (Nation, 2003). California can leverage metrics and lessons learned in the EU, Japan and South Korea and collaborate with Canadian efforts to develop a tire efficiency program."

We also recommend the following addition to the Transportation Sustainability "On-going and proposed measures – vehicle technology" sub-section IV.C.3:

"Improve light duty vehicle fuel economy for passenger vehicles by 4% through policies that achieve fuel efficient replacement tires and achieve the goals of AB 844 (Nation 2003)."

We appreciate your consideration of our comments. Please feel free to contact Ed Pike of my staff or have your staff contact him at epike@energy-solution.com or (510) 482-4420 x 239 if you have any questions.

Sincerely,

Mike McGaraghan

Mull Mcyny

Director

Energy Solutions

⁴ Pike, E. and S. Schneider. 2013. Passenger Vehicle Replacement Tire Efficiency Report. p.2

⁵ Pannone, G. 2015. Technical Analysis of Vehicle Load Reduction Potential for Advanced Clean Cars. p. 41; NRC. 2006. Tires and Passenger Vehicle Fuel Economy: Informing Consumers, Improving Performance—Special Report 286. Washington, D.C.: The National Academies Press. Chapter 3.; Viegand Maagoe A/S. 2016. Final Report: Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres. p.5. This study focuses on the EU labeling program. The EU has adopted both standards and a labelling program. In addition, ARB, U.S. EPA, and NHTSA predict that the rolling resistance of tires shipped with new vehicles will continue to improve significantly due to vehicle GHG and fuel economy standards through 2021, with even greater improvements through 2025. ARB, US EPA, NHTSA. 2016. Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhous Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025.
⁶ Pike. E. 2011. Opportunities to Improve Tire Energy Efficiency.

April 10, 2017

Clerk of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814



RE: The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target

On behalf of Food & Water Watch and our over 186,000 supporters in California, we respectfully submit these comments on "The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target."

The California government, and in particular the Air Resources Board (ARB), has a duty to serve and protect the people of California, not polluting industries. Unfortunately, not only do the Proposed Scenario and Alternatives 2, 3 and 4 — which propose extending cap-and-trade beyond 2020, a carbon tax, all cap-and-trade and cap-and-tax, respectively — fail to put forward effective and achievable paths towards rapid, significant and permanent emission reductions, but also fail to protect Californians, their health and the health of our shared environment.

For reasons explained below, "Alternative 1: No Cap-and-trade" is the only option that provides the certainty needed for rapid, significant and permanent emission reductions to avoid the worst effects of climate chaos. It is also the only scenario that truly prioritizes direct emission reductions to protect the state's most impacted and disadvantaged communities as currently required under the laws enacted by the legislature in 2016.

In order to meet the current legal mandate and properly protect the health, safety and welfare of Californians, the environment and, ultimately, the planet, ARB must do the following:

- 1. Adopt "Alternative 1: No Cap-and-trade" to require direct emission reductions, and reject all market-based solutions including cap-and-trade, a carbon tax and cap-and-tax
- Reject "renewable" natural gas and reject carbon sequestration in natural environments and working lands

The immediate threat of climate change means we do not have time for a failing cap-and-trade approach or a carbon tax — or any market-based "solution" — that will leave us decades from now in the same dire circulstances we now face. It is irresponsible and immoral to place the burden of unproven market schemes like cap-and-trade and carbon taxes on those most at-risk from climate change, including lowincome communities and communities of color — policies to reduce emissions should protect these communities and our environment first and always, not sacrifice them in favor of polluter interests. Rapid, significant and permanent reductions in greenhouse gas emissions by way of direct emission reductions on a source-by-source basis is the only proven way out of our climate crisis.



- 1. Adopt "Alternative 1: No Cap-and-trade" to require direct emission reductions, and reject all market-based solutions including cap-and-trade, a carbon tax and cap-and-tax
 - a. "Alternative 1: No Cap-and-trade" Provides the Most Certainty of Permanent Emission Reductions

The proposed emission reduction scenarios all have degrees of uncertainty regarding how likely each is to achieve reduction goals. Out of all of the scenarios, "Alternative 1: No Cap-and-trade" provides the most certainty of reaching the 2030 reduction target, and of possibly even surpassing it. In the "ideal" Alternative 1 scenario it is estimated that the approach could actually *exceed* the needed reductions by about 73 million metric tons of carbon dioxide equivalent (MMT CO₂e), meeting approximately 110 percent of the 2030 reduction goal. The "uncertainty" version of Alternative 1 could fall short of the 2030 goal by about 138 MMT CO₂e, but this is still better than the possible shortfall of even the "ideal" Proposed Scenario of cap & trade alone. (See below).

Not only are the direct source reductions contemplated under Alternative 1 the best approach to ensure that the state meets its legislative goals, but it is the only approach provided for post-2020 under current law. Under AB 197 California is mandated to protect the state's most impacted and disadvantaged communities by prioritizing "Emission reduction rules and regulations that result in direct emission reductions at large stationary sources of greenhouse gas emissions sources..." — Alternative 1 is the only scenario that prioritizes such direct emission reductions to protect the most impacted and disadvantaged communities. Any potential shortfall of Alternative 1 could also be covered by the state committing to 100 percent renewable energy and zero emissions by 2035² and incrementally increasing state RPS standards to help achieve this.

b. Cap-and-Trade Is Not an Effective Approach to GHG Emissions Reductions

Both the Proposed Scenerio and Alternative 3 embrace a cap-and-trade program to attain the state's current climate mandate. However, even ARB concedes that these market approaches, even under "ideal" circumstances, involve a fairly high degree of uncertainty. ARB's "ideal" Proposed Scenario of implementing cap-and-trad alone has substantial uncertainty — leaving an estimated gap of 191 MMT CO₂e, or nearly 30 percent of all emission reductions needed between 2021 and 2030. While this represents the "ideal" outcome, the estimated "uncertainty" version of the Proposed Scenario, shows that cap-and-trade alone could be expected to reduce emissions by as much as 342 MMT CO₂e, or only about 50 percent of all greenhouse gas emission reductions needed between 2021 and 2030 — this places extraordinary reliance on a risky and otherwise unproven method.

We do not have time to waste on policies that cannot reliably deliver rapid, significant and permanent emission reductions. There is no evidence that cap-and-trade will be able to deliver the substantial, direct emission reductions that California and our planet so badly need, and we cannot afford to "wait and see" if it works ten to fifteen years from now. Regulated, source-by-source, direct emission reductions are the only approach that has delivered legitimate reductions — this is the only path forward.

In California there is not yet any evidence that the current cap-and-trade program has decreased greenhouse gas emissions. In fact, rather than require emissions be cut at the source of pollution, the

89-1



program undermines permanent emission reductions within the state by allowing polluters to purchase and sell emission allowances, as well as a limited number of offset credits that allegedly reduce emissions elsewhere. The most significant drop in emissions since AB 32 passed in 2006 coincided with the 2007-2009 Great Recession, and those reductions predate the implementation of cap-and-trade. Warmer winters in recent years and subsequent decreases in energy for home heating have also led to emissions decreases — not cap-and-trade.

89-1 cont.

What makes ARB's continuing insistence on a cap-and-trade approach to GHG reduction particularly egregious is a recent study that documents the impact of the practice on environmental justice communities in the state. A 2016 report found that industrial facilities are more often located in low-income communities and communities of color, and that many of these industrial polluters (that are covered by the cap-and-trade market) have had increases in localized greenhouse gas emissions during the current cap-and-trade program, not decreases. Despite this, ARB continues to dismiss and downplay the concerns of environmental justice groups and the communities they represent — the 2030 scoping plan disregards much of the recommendations made by the Environmental Justice Advisory Committee (EJAC). Cap-and-trade is failing these communities and must be replaced with direct emission reductions that do not sacrifice the health of the most impacted and disadvantaged communities in favor of polluter interests.

89-2

Other state market approaches to pollution control have also failed. The Los Angeles' Regional Clean Air Incentives Market (RECLAIM) — an anti-smog cap-and-trade program run by the South Coast Air Quality Management District (SCAQMD) since 1993 — has failed to adequately reduce ozone levels and air pollution from particulate matter. Prior to RECLAIM, regulatory approaches showed dramatic reductions in many smog-related pollutants, which stopped after RECLAIM was implemented. ⁵ The SCAQMD voted in March to phase-out the failed RECLAIM program and replace it with mandatory cuts in pollution. ⁶

While California's current GHG cap-and-trade program is a fairly recent approach, we do know that the largest existing carbon market in the world – the European Union's – has, like California's other forays into market pollution control approaches, been an abject failure in many ways. With a total value of \$4 billion as of 2014, the biggest pollution marketplace experiment is the ongoing European Union Emissions Trading System (EU ETS). It was included as one of the mechanisms for meeting national emissions targets under the Kyoto Protocol to reduce climate-altering greenhouse gas emissions from industries around the globe

Thirty one countries are part of this regional cap-and-trade system. The EU ETS only covers certain sectors, such as power generation and steel manufacturing, but not others, such as transport and agriculture. The EU ETS aims to reduce CO_2 emissions in these sectors 20 percent by 2020. Trading started in 2005. It has been fraught with significant problems and, at times, seems to be teetering on the edge of complete collapse. As was recently the case in the California allowance market, the price for carbon in the EU ETS has been incredibly volatile. It reached ϵ 30 in 2008, languished below ϵ 10 for most of 2012, hitting a low of ϵ 5.99 in April of that year. This kind of volatility undermines economic planning, while allowing some companies to reap a windfall with over-allocation.

As one recent EU ETS commentator states: "The price of carbon is less than per permit, way below 7€ an impactful threshold. Only around 45 are currently covered by the ETS, of emissions in the EU %

3



with a number of exceptions, and up to half of all thepermits are being given away for free. The result is plain and simple — it is cheaper to pollute. Not only that, but the low carbon price makes it hard, if not impossible, for certain new technologies to emerge."

The EU ETS has also attracted hackers and outright fraud, culminating in shutting down the spot market in 2011 after a group of Eastern European hackers cost EU governments up to €5 billion in an attack. From stolen and fraudulent credits to stockpiling, plunging demands and miscalculated caps, the carbon cap-and-trade program has more problems associated with it than any traditional regulatory program could.

Even where cap-and-trade systems have, arguably, resulted in decreased emissions, they have proven to be less effective than source-by-source, command and control approaches. Title IV of the 1990 Clean Air Act Amendments, known as the Acid Rain Program, or ARP, has become the poster child for pollution trading proponents. It was enacted to address the main causes of acid rain — the emission of sulfur dioxide (SO_2) and nitrogen oxides (SO_3) from coal-fired power plants — through a system of buying and selling emission allowances. The goal of ARP was to reduce annual SO_2 emissions to about 9 million tons by 2010, down from the 15.7 million tons emitted in 1990.

While recent modeling indicates that this reduction target was reached by 2007, it remains far from clear whether the reductions were due to pollution trading or in spite of trading. For example, we know that the U.S. Environmental Protection Agency (EPA) now attributes at least 1 million tons of SO₂ reductions during ARP to factors unrelated to trading, namely the increased availability and switch to low-sulfur coal sources from the Powder River Basin in the early 1990s.

Prior to the enactment of Title IV, an assessment projection indicated that reductions in SO₂ as great as those achieved under a market-based ARP could be attained if older coal-fired power plants simply complied with the Clean Air Act's New Source Review (NSR) technology retrofitting requirements. But with the introduction of trading, those technological modifications fell by the wayside. As one 2005 report indicates, "Experience since 1990 has shown that most of these facilities have managed operations to avoid triggering NSR, resulting in facility life being extended longer and adoption of new control technologies being slower than many analysts predicted in 1990."

While we may never know the real impact of substituting trading mechanisms for technological upgrades on U.S. SO_2 emissions, results from Europe's contemporaneous acid rain approach indicate that we would have done much better sticking with regulatory approaches. A 2004 comparative study of the U.S. trading approach to SO_2 with the European Union's and Japan's regulatory "command and control" systems show a much greater reduction without trading. While the United States attained a 39 percent reduction in SO_2 during Phase I of the ARP program, the EU achieved a 78 percent reduction. Japan's emissions fell by 82 percent.

The ARP could only be considered a successful trading program if you ignore the reductions we would have achieved had we continued to force these industries to comply with the law and upgrade their reduction technology, without allowing trading.

Perhaps one of the most troubling aspects of the current state market-based system is the use of emission reduction unit offsets in lieu of at-source reductions. Regardless of whether the proposed offsets occur

89-3



within or outside of California, any kind of offset is a legitimate threat to achieving real, additional or permanent emissions reductions. Offsets allow polluters to avoid the urgent need to stop polluting at the source and instead allow them to pay to continue their harmful activities with impunity, while claiming that emissions have been reduced elsewhere. Moreover, the agenda behind offsets, as is clear here, too often places priority on cost containment, market efficiency and making it easier for polluters to comply, disregarding the true climate change priority of reducing GHG emissions.

The issue of permanence presents one of the most egregious problems with offsets. The dictionary defines permanence as "the state or quality of lasting or remaining unchanged indefinitely." However, offsets obtained from a variety of sources — manure digesters, forestlands, etc. — are never truly permanent. For example, trees can be harvested, burnt down in wildfires or killed by disease and drought. In addition, the use of third party verifiers, many of whom profit from the generation and sale of offset credits, adds a high degree if unreliability to any offset verification system. This is especially exacerbated when out-of-state offset sources are used, where regulatory authorities will have virtually no method to independently verify offset reductions.

Many pollution trading systems, from the EU ETS to the U.S. Renewable Fuels Standard RIN program, have been riddled with documented instances of fraud because of the reliance on third party verification systems and government agencies' inability to oversee credit generation processes. With its offset approach, the cap-and-trade scoping approaches are inviting similar issues with regard to GHG emission reductions and the generation of offset credits. The lack of clear GHG reduction measurements and methodology for many offset sources — for example, the exact amounts of carbon dioxide (CO₂) stored in forests — also leaves the program open to fraud and manipulation. With these highly variable reduction estimates, offsets are then sold for exact amounts of avoided emissions. A modeled estimate does not equal an exact amount of emissions. It doesn't add up.

California's regulations hold that, "A registry offset credit must represent a GHG emission reduction or GHG removal enhancement that is real, additional, quantifiable, permanent, verifiable, and enforceable" (Health and Safety Code §38562(d)(1) and (2)). Yet time and again, approved offsets do not meet these requirements.

In 2011, Brubaker Farm in Pennsylvania built a manure digester using taxpayer funding to provide electricity for the farming operation. The owner of the farm is on record as saying he originally built the digester not for credits, but for electricity. Yet, in 2015 California's ARB retroactively certified the Brubaker digester as a GHG emissions offset generator, and California industries can now take advantage of this facility to continue their own emissions even though the digester was already in place, and operating.

Likewise, ARB approved the 704-acre Pungo River Forest Conservation Project in North Carolina as a source of GHG emission offsets even though this stand of forest was put into permanent conservation easement in 2003. Seeking out already existing projects across the country to generate GHG emission reductions and subsequent offset credits for use in the state of California means that no additional GHG reductions are happening.

The lack of accountability in offset approaches is not restricted to California. A recent study of a European Union offset program found that 80% of credits were unverifiable. This means that polluters

89-3 cont.



were able to buy offset credits to pollute more from sources that may or may not have actually reduced emissions.

There is nothing in proposed scoping plan that gives FWW any comfort that similar non-real, non-verified and non-additional offset reductions will not also regularly occur as they have in all other GHG emissions offset systems. In fact, given the complexity of the cap-and-trade and offset approach and the inability of ARB to adequately oversee such a convoluted method of emissions reduction, it is virtually inevitable that the approach will not achieve the reductions projected, much less the ones needed to protect our planet and communities. Offsets cater to profit-driven third party verifiers and self-interested industries that are highly motivated to game the system for their own benefit.

89-3 cont.

The offsetting approach is not the only problem. Cap-and-trade is a regulatory framework that seeks to eliminate one of the most important tenets of the Clean Air Act, which is that companies do not have an inherent right to pollute. Under cap-and-trade policies, polluters are being given a right to threaten public health and the environment, as long as they pay for it. These schemes essentially create loopholes that allow polluters to continue dumping and discharging rather than holding them accountable for their pollution.

Trading creates a mechanism where profits determine who is able to pollute and can actually lead to an overall increase in pollution along with regional pollution hot spots, as larger and well-financed polluters will often opt to purchase credits rather than install pollution control equipment. As described above, this happened with the Los Angeles air pollution trading programs under the Rule 1610 and RECLAIM programs in which communities of color near the city's refinery district suffered from increased air pollution when these facilities purchased emissions credits instead of installing reduction technologies.

While proponents of cap-and-trade and offsets tout the regulatory flexibility benefits of these policies, in reality these policies allow polluting industries to put profit above the interests of public health and the environment. We need to strengthen protections under the Clean Air Act that have worked for decades to help hold polluters accountable, rather than rolling back some of the most important public health laws for decades.

c. A Carbon Tax or Cap and Tax Is Not an Effective Approach to GHG Emissions Reductions

Carbon taxes have not been proven an effective means to reduce emissions, either, and pose a threat to Californians, especially low-income households and individuals. In October, 2016, Food & Water Watch released a report on British Columbia's carbon tax, which has been in place since mid-2008. Our analyses of the province's emissions data found that total emissions actually increased by about 2.2 percent from 2009 (the first full year the tax was in place) to 2014 (the most recent year for which data is available). Taxed emissions rose even more, increasing by 4.3 percent from 2009 to 2014. We hereby incorporate this report into these comments.

In addition, despite the British Columbia carbon tax being structured as revenue neutral — wherein all revenue generated is returned to businesses and citizens — over the years the main recipients of the revenue have changed significantly. In the beginning, low-income households received a majority of the tax revenue, but in more recent years corporations now receive the lion's share of the revenue. Even



though the tax is technically revenue neutral, it has still had regressive effects and places an adverse burden on low-income households and individuals.

No matter how a carbon tax is structured, the added costs will be passed down to consumers typically in the form of increased gasoline and home fuel heating charges. One of the reasons why ExxonMobil and other fossil fuel companies support a carbon tax is because they know that it will have no real impact on their production and profits; consumers will pay the tax and still be forced to consume their products for the foreseeable future. Consumers who rely on their cars to get to work, shops and the doctors' offices are not going to stop driving because gas increases \$1 or even \$2 and more per gallon at the pump. Nor are they going to stop heating their homes with fossil fuels when no viable alternatives exist. What they do is cut back on other expenses and other needs so they can fill their car up and heat their home.

We are also convinced that the adoption of false, industry-friendly market approaches, like carbon taxes and carbon cap-and-trade programs, will foreclose real climate solutions like mandatory, source-by-source emission reductions as we sit back for decades to see how these pay-to-pollute programs play out. We are now witnessing how California's cap-and-trade program is still being pursued, despite evidence that it has resulted in added emissions of pollution in underserved communities, because the state has become increasingly reliant on revenue raised from the sale of carbon allowances. Raising revenue from pollution is not a method to reduce emissions, but a way in which state governments balance general budget needs while industries simply pass on costs to struggling consumers.

We ask that you stand strong for real climate solutions and reject any attempt to implement an ineffective and regressive carbon tax as a GHG reduction approach.

2. Reject "renewable" natural gas and reject carbon sequestration in natural environments and working lands — in both Alternative 1 and in all present and future scenarios

a. Reject "Renewable" Natural Gas

In California, about 55 percent of in-state methane emissions — a greenhouse gas that traps 87 times more heat over a 20-year time period than carbon dioxide¹⁰ — come from livestock operations, 25 percent of which is from dairy manure alone and the remaining 30 percent is from enteric livestock emissions. In partial response to this problem, ARB has proposed generating "renewable natural gas," or RNG, from dairy manure. However, the volume of manure produced from industrial dairy operations in California is an environmental crisis, and unsustainable factory farming should not be perpetuated through false solutions like "renewable natural gas."

As of the 2012 agricultural census, California had approximately 1.7 million dairy cows on factory farms, which produced ten times more waste than what the entire human population of California produces in one year. ¹¹ It is equivalent to the amount of human sewage generated by about 380 million people in one year — greater than the entire U.S. population. ¹² RNG sourced from factory farm dairy manure is dirty energy — and subsequently is not suitable for use in any RPS.

ARB proposes using anaerobic digesters to convert dairy manure into RNG, but this would be very expensive, not to mention that digesters have been plagued by performance problems and require tax



subsidies to be economically feasible, as discussed in the attached Food & Water Watch fact sheet on the problems with manure digesters. In order to comply with the SB 1383 mandate to reduce methane emissions 40 percent below 2013 levels by 2030, some estimate that at least 200 new digesters must be built. However, the cost for 200 digesters is about \$750 million — and this would only address methane emissions from manure. Use the high failure rate of digesters in California, the state shouldn't be investing in, or incentivizing, ineffective digester technologies.

RNG would also perpetuate significant risks to the health of Californians and to our environment. First, it is not a clean source of energy — RNG still releases carbon dioxide emissions into the air when combusted or flared, and methane from any source is neither emissions neutral nor clean. In addition, methane digesters do little to mitigate the water pollution caused by animal waste from industrial dairies. Nitrates contained in manure stored in lagoons have contaminated groundwater by seeping through the liner of the lagoon floor. 15 In other instances, excessive manure spread on fields has contaminated groundwater, causing nitrate levels to rise above what is safe for human consumption. 16 Rainstorms have also washed animal waste into surrounding streams and rivers, which has resulted in a number of algal blooms that destroy aquatic ecosystems. ¹⁷ Finally, practices common on factory farms can lead to public health impacts, such as foodborne illness, including E. coli and Salmonella contamination and the risk of mad cow disease. The large number of animals raised in cramped conditions creates a perfect breeding ground for the formation of new diseases, and the routine use of antibiotics in factory farms can lead to the creation of deadly antibiotic-resistant bacteria. 18 These harms outweigh any alleged benefit of increased RNG production. Instead, ARB should be regulating existing factory farms while incentizing conversion to pasture-based production, which will lead to climate benefits and require no investment in expensive, polluting technology.

b. Reject Carbon Sequestration in Natural Environments and Working Lands

California's "Natural Environment and Working Lands" are not a receptacle to sequester polluter's continued carbon dioxide emissions, instead of reducing emissions at the source. The state already experiences serious wildfires that damage the natural environment and working lands, and as climate change continues — increasing temperatures and potential drought conditions — this increases the likelihood of forest fires. Recent research shows that the aftermath of these fires is significantly hampering the regenerating ability of trees, which affects the ability of trees to sequester carbon dioxide emissions from the air. ¹⁹

Similarly, the idea that soils can be relied on as a carbon sink is also ill-conceived and not a substitute for direct emission reductions. A recent study found that continued rising temperatures will "stimulate the net loss of soil carbon to the atmosphere, driving a positive land carbon-climate feedback that could accelerate climate change." This means that cutting existing emissions may not be enough, because the earth itself could become a significant source of emissions in the twenty-first century.

ARB also suggests that carbon dioxide emissions can be stored in the oceans. However, our oceans are already over-burdened with carbon dioxide that is causing ocean acidification, because of exceedingly high atmospheric levels of CO_2 — adding additional CO_2 emissions to the ocean instead of requiring that polluters reduce emissions at the source would only precipitate the dying of our oceans. Ocean acidification is already affecting waters off the coast of California and up the western seaboard into Canada and Alaska, ²¹ and California is particularly susceptible to the effects of ocean acidification

89-6

89-5



because of inherently low pH levels from the California Current.²² Studies have found evidence of pteropod shell dissolution off the coast of California²³, and more recent studies indicate that Dungeness crab, rock fish, dover sole and other west coast sea life are at risk of significant declines because of ocean acidification.²⁴ We are well beyond the time of short-cuts and "kicking the can down the road" the only reliable option left is direct emission reductions without exception.

89-6 cont

Conclusion

The best way for California, and the planet, to avoid the worst effects of climate chaos is to require direct emission reductions from polluters and to adopt a goal of 100 percent clean, renewable energy and zero emissions by 2035, which would simultaneously require an increasingly higher RPS in order to achieve this target. California is in a unique position to truly be a leader in fighting climate change. We at Food & Water Watch urge ARB not to waste this opportunity on false solutions like cap-and-trade and carbon taxes, which would only jeopardize meaningful emission reductions and the critical need to transition to 100 percent clean, renewable energy. Put the people of California, and our shared environment, first before profits and polluter interests.

Sincerely, Adam Scow California Director Food & Water Watch

Endnotes

¹ California Air Resources Board. "Discussion Draft: 2030 Target Scoping Plan Update." December 2, 2016 at 92 to 96; California Air Resources Board. "The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target." January 20, 2017 at 31 to 52.

See Food & Water Watch. "100 Percent Clean Energy by 2035 to Stop Global Warming." December 8, 2015.

³ U.S. Energy Information Administration. "Heating Degree Days, Pacific Region." Available at $\underline{https://www.eia.gov/outlooks/steo/data/browser/\#/?v=28\&f=A\&s=\&start=2005\&end=2018\&map=\&ctype=linechart\&mapty=2008end=2018\&map=&ctype=linechart&mapty=2008end=2018\&$ pe=0&id=&linechart=ZWHD PAC~ZWHD PAC 10YR. Accessed on March 23, 2017; U.S. EIA. "California Carbon Dioxide Emissions." Available at https://www.eia.gov/environment/emissions/state/. Accessed on March 23, 2017.

⁴ Cushing, Lara J. et al. "A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program." Research Brief. PERE Publications. September 2016.

See Food & Water Watch. "Pollution Trading: Cashing Out Our Clean Air and Water." Issue Brief. December, 2012. ⁶ McNary, Sharon. "AQMD approves new smog-cutting plan." Southern California Public Radio. KPCC-Pasadena, CA.

http://www.europeanpublicaffairs.eu/the-unclear-future-of-eu-ets-is-there-is-still-a-chance-of-success/ ⁸ Food & Water Wateh. "The British Columbia Carbon Tax: A Failed Experiment in Market-Based Solutions to Climate

Change." Report. October 2016.

⁹ Ibid.
¹⁰ Myhre, Gunnar et, al. "Anthropogenic and Natural Radiative Forcing." In Stocker, T.F. et. al. (2013). Climate Change
¹⁰ Myhre, Gunnar et, al. "Anthropogenic and Natural Radiative Forcing." In the Fifth Assessment Report of the Intergovernm. 2013: The Physical Science Basis. Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press at 714.

¹¹ U.S. Environmental Protection Agency (EPA). "Risk Assessment Evaluation for Concentrated Animal Feeding Operations." EPA/600/R-04/042. May 2004 at 9; Food & Water Watch calculation comparing human and livestock waste production based on EPA (2004) at 9. The average human produces 183 pounds of manure annually compared to 30,000 pounds for 1,000 of live weight dairy cow (which is one dairy cow animal unit). Every dairy cow animal unit produces 163.9 times more manure than an average person. Food & Water Watch multiplied the number of dairy cow animal units on operations of over 500 cows in each county by 163.9 to come up with a human sewage equivalent. U.S. EPA reports that "A



dairy CAFO with 1,000 animal units is equivalent to a city with 164,000 people," which means that one dairy animal unit is equivalent to 164 people, which matches Food & Water Watch's calculations. The human sewage equivalent was compared to the U.S. Census Bureau figures for metropolitan area population estimates. U.S. Census Bureau. "Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2012." (CBSA-EST2012-01). 12 *Ibid.*

Ashton, Adam. "California's dairy industry knows how to cut its greenhouse gas emissions, but can it afford to do it?"

Sacramento Bee. September 17, 2016.

You was a superscript of the supe over 500 head of cows) multiplied by the average number of about 2,900 cows per operational dairy digester operation in California; U.S. Environmental Protection Agency. "AgStar Livestock Anaerobic Digester Database." Available at https://www.epa.gov/agstar/livestock-anaerobic-digester-database. Accessed on March 20. 2017; Shelford, T. Cornell University. "Estimating Farm Size Required to Economically Justify Anaerobic Digestion on Small Dairy Farms." 2012 at 1.

¹⁵ Marks, R. 2001. Cesspools of Shame: How Factory Farm Lagoons and Sprayfields Threaten Environmental and Public Health. Natural Resources Defense Council. Retrieved from: https://www.nrdc.org/water/pollution/cesspools/cesspools.pdf

^{16 &}quot;Pollution from Giant Livestock Farms Threatens Public Health". 2013. National Resources Defense Council. Retrieved from: http://www.nrdc.org/water/pollution/nspills.asp

¹⁷ Hribar, C. et al. 2010. *Understanding Concentrated Animal Feeding Operations and Their Impact on* Communities. National Association of Local Boards of Health. Retrieved from: http://www.cdc.gov/nceh/ehs/docs/understanding cafos nalboh.pdf

¹⁹ Welch, Kevin R. et al. "Predicting conifer establishment post wildfire in mixed conifer forests of the North American

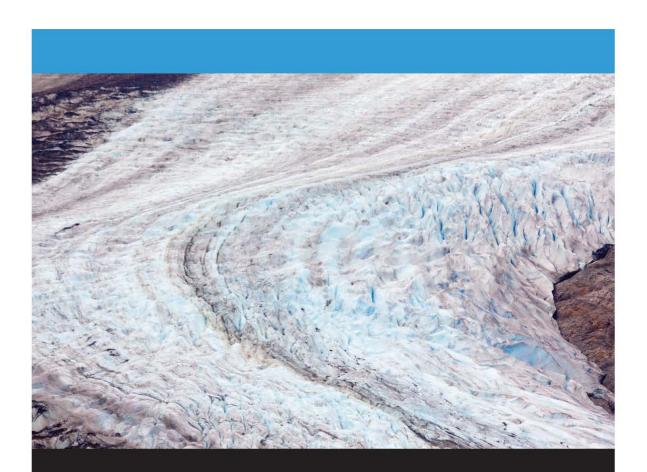
Mediterranean-climate zone." *Ecosphere*. Vol. 7. Iss. 12. December 2016.

²⁰ Crowther, T.W. et al. "Quantifying global soil carbon losses in response to warming." *Nature*. Vol. 540. December 2016. ²¹ See Food & Water Watch. "Ocean Acidification: How CO₂ Emissions and False Solutions Threaten Our Oceans." June,

<sup>2015.

22</sup> Marshall, Kristin N. et al. "Risks of ocean acidification in the California Current food web and fisheries: ecosystem model projections." Global Change Biology. Vol. 23. Iss. 4. January 12, 2017.

Bednarsek, N. et al. "Limacina helicina shell dissolution as an indicator of declining habitat stability due to ocean acidification in the California current Ecosystem." Proceedings of the Royal Society B. Vol. 281, Iss. 1785. April 2014 at 5; Fabry et al. "Impacts of ocean acidification on marine fauna and ecosystem processes," 2008 at 418 and 424. ⁴ Marshall, Kristin N. et al. 2017.



The British Columbia Carbon Tax

A Failed Experiment in Market-Based Solutions to Climate Change



About Food & Water Watch

Lood & Water Watch champions healthy food and clean water for all. We stand up to corporations that put profits before people, and advocate for a democracy that improves people's lives and protects our environment. We envision a healthy future for our families and for generations to come, a world where all people have the wholesome food, clean water and sustainable energy they need to thrive. We believe this will happen when people become involved in making democracy work and when people, not corporations, control the decisions that affect their lives and communities.

Food & Water Watch has state and regional offices across the country to help engage concerned citizens on the issues they care about. For the most up-to-date contact information for our field offices, visit *foodandwaterwatch.org*.

National Office

1616 P Street, NW Suite 300 Washington, DC 20036 (202) 683-2500

Oakland, California	Los Angeles, California	Miami, Florida	St. Petersburg, Florida
1814 Franklin Street	3000 S. Robertson Boulevard	2103 Coral Way	233 3rd St. N
Suite 1100	Suite 255	2nd Floor	Unit 101
Oakland, CA 94612	Los Angeles, CA 90034	Miami, FL 33145	St. Petersburg, FL 33701
(510) 922-0720	(323) 843-8450	(954) 687-9267	(954) 687-9224
	¥		
Colorado	lowa	Maine	Maryland
1740 High Street	505 Fifth Avenue	142 High Street	3121 St. Paul Street
Denver, CO 80218	Suite 818	Suite 501-C	Suite 28
(720) 449-7505	Des Moines, IA 50309	Portland, ME 04101	Baltimore, MD 21218
	(515) 344-4834	(207) 619-5845	(410) 394-7650
Michigan	New Jersey	New Mexico	New York
2727 Second Avenue	100 Bayard Street	7804 Pan American	147 Prince St.
Suite 136	Suite 202	East Freeway NE #2	4th Floor, No. 7
Detroit, MI 48201	New Brunswick, NJ 08901	Albuquerque, NM 87109	Brooklyn, NY 11201
(313) 486-1356	(732) 839-0860	(505) 633-7366	(718) 989-3928
North Carolina	Illinois	Oregon	Pennsylvania
801 Gilbert Street	670 W Hubbard Street	917 SW Oak Street	1501 Cherry Street
Suite 204	Suite 300	Suite 404	Second Floor



Portland, OR 97205

(971) 266-4528

Philadelphia, PA 19102

(267) 428-1903

Chicago, IL 60654

(773) 796-6086

Copyright © October 2016 by Food & Water Watch. All rights reserved. This report can be viewed or downloaded at foodandwaterwatch.org.

Durham, NC 27701

(919) 794-6380

The British Columbia Carbon Tax

A Failed Experiment in Market-Based Solutions to Climate Change

TABLE OF CONTENTS

Executive Summary				
Introduction				
The Theory Behind British Columbia's Carbon Tax				
Carbon tax fails to have long-term impact on greenhouse gas emissions				
Motor fuel sales rise steadily despite carbon tax				
Debunking the pricing proponents' misleading claims				
British Columbia carbon tax rebates favor businesses over lower-income households 7				
ExxonMobil carbon tax endorsement should give environmentalists pause 8				
Summary				
Recommendations and Conclusion				
Data and Methodology				
Endnotes 10				

The British Columbia Carbon Tax: A Failed Experiment in Market-Based Solutions to Climate Change

Executive Summary

Our planet's climate crisis is intensifying, but many in industry, government and even the advocacy community have turned to market mechanisms to alleviate climate change instead of regulating the pollutants that cause it. These free-market approaches rely on putting a "price" on climate change-inducing emissions — such as imposing taxes on carbon — as an indirect method to reduce these pollutants.

The Canadian province of British Columbia implemented a carbon tax on certain fossil fuels in July of 2008. Some experts and pricing proponents are using the British Columbia carbon tax example to promote carbon taxes and other market mechanisms as a way to purportedly reduce greenhouse gas emissions and address our climate problem.¹ Unfortunately for these free-market proponents, the real-world record fails to demonstrate that British Columbia's carbon tax reduced carbon emissions, fossil fuel consumption or vehicle travel. Most of the modest and short-term reductions in emissions seem to be related primarily to the 2008 global recession, not to the carbon tax. More recently, British Columbia's emissions have resumed their rise.

This report examines the British Columbia program and finds that this type of pricing approach is not going to save the planet or safeguard our communities. A more straightforward approach of regulating emissions would be significantly more effective at curbing climate change.

Introduction

We are in the midst of a global pollution problem that threatens our environment, public health and future generations. Emissions of greenhouse gases, especially carbon dioxide (CO₂) and methane (CH₄), into the atmosphere are driving serious climatic changes that will threaten coastal communities, water resources and agricultural productivity, and have many other significant ecological impacts.

Human activity, primarily in the form of the burning of fossil fuels, is propelling the release of CO_2 emissions into the atmosphere at a rate that is 10 times faster than at any time in the last 66 million years. Preventing the worst effects of climate change and avoiding a 1.5 degree Celsius temperature rise — which means not emitting more than 400 gigatonnes of CO_2 starting in 2011 — requires driving greenhouse gas emissions essentially to zero. The most prudent way to do this is to transition to a 100 percent clean energy system and zero emissions by 2035.



Many policies, from strict regulatory controls to market-based approaches (including carbon credit trading schemes, carbon taxes and other carbon pricing mechanisms) have been proposed to counter this impending crisis. In the 1970s, the United States successfully stopped and reduced many forms of air pollution with the Clean Air Act by establishing limits on industrial pollutants, and effectively regulating polluting industries. The sensible approach to climate change should be based on this empirically demonstrated model.

Unfortunately, governments, including the United States, currently lack the political will to take the concrete steps necessary to successfully address and curtail greenhouse gas emissions. Rather than setting mandatory emissions limits and requiring polluters to meet these in order to achieve greenhouse gas emission reductions, experts — and their recommendations to policy makers — are shying away from effective regulations on industry. Instead, there has been a major shift, driven by industry and economists, to rely on the marketplace to control pollution.

Many frequently hold out British Columbia as an example of a successful carbon tax program that significantly reduced CO_2 emissions. The data do not support these claims. British Columbia achieved only minimal and short-term province-wide greenhouse gas emission reductions immediately after the tax was implemented, and it is highly questionable whether the carbon tax even caused these declines.

The carbon tax only went into effect in the second half of 2008, and while there was a decline in emissions from 2008 to 2009, it is impossible to attribute that one-year drop to a tax that was in place for only half of 2008 — especially since taxed greenhouse gas emissions rose by a total of 4.3 percent between 2009 (the first full year that the tax was in place) and 2014. British Columbia's carbon tax failed to reach the reduction targets necessary to ensure a sustainable climate, demonstrating that carbon taxes are not a viable policy solution to climate change.

The Theory Behind British Columbia's Carbon Tax

Economists are not going to solve our pollution problems. Much of our industrial activity has substantial social or environmental costs that often are not factored into business costs. It may make perfect economic sense to operate a coal-fired power plant based on what it costs to buy coal and what can be charged for electricity, but only if you do not consider the costs of pollution on communities or the environment. Economists call these costs "externalities."

The proponents of market mechanisms believe that if these externality costs — costs to society — could be included in the price of the activity that generates carbon emissions, it would deter and reduce that pollution. Companies and individuals would be encouraged to reduce emissions to cut their costs through the marketplace, without the heavy hand of regulation. A carbon tax raises the price on human activities that generate carbon emissions, internalizing the cost and discouraging behavior that causes climate change.

On July 1, 2008, the Canadian province of British Columbia implemented a carbon tax, imposing a surcharge on each tonne of greenhouse gas emissions from the combustion of fossil fuels in an attempt to "elicit a powerful market response across the entire economy resulting in reduced emissions." Despite the explicit desire for an economy-wide effect, the tax covers only fossil fuels used for transportation, heating and industrial processes, which amounts to about 70 percent of British Columbia's total greenhouse gas emissions. The tax started at C\$10 per tonne of CO₂-equivalent emissions (CO₂e) and increased by C\$5 per tonne each year until reaching the current tax rate of C\$30 per tonne of CO₂e in 2012.

The carbon tax was designed to be revenue-neutral, meaning that all revenue generated would be returned to taxpayers through tax credits and rebates.¹⁵ Additional protections, such as low-income tax credits, were built into the tax to try and ensure that it did not unfairly burden lower-income individuals and families.¹⁶ The carbon tax revenue was directed to both individual and business tax cuts.¹⁷

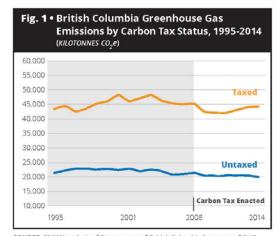
It should be noted that a carbon tax is theoretically designed to raise the cost of greenhouse gas emissions, but if those costs are refunded it almost defeats the purpose. The price of climate change is only included at the point of emissions, but since it ultimately is returned to the companies and individuals, over time it may create little disincentive to pollute. 18

Carbon tax fails to have long-term impact on greenhouse gas emissions

Carbon tax proponents have significantly overstated the purported beneficial effects of the British Columbia carbon tax. Although greenhouse gas emissions have continued to decline since the 2004 peak through the first full year the carbon tax was in place, the initial decline under the tax from 2008 to 2009 was more likely recession-related, as the tax does not appear to have had a long-term impact. Greenhouse gas emissions have been rising rapidly in recent years even as the tax rate and total tax revenues have increased. Moreover, the short-term declines in taxed greenhouse gas emissions were more modest and were reversed more quickly than the changes to the *untaxed* greenhouse gas emissions — exactly the opposite of what would happen if carbon taxes had a causal impact on changing emissions.

Carbon tax advocates have been able to promote the British Columbia model as a success only by looking at a very narrow time window of the few years after the carbon tax went into effect, including 2008 when the tax was in effect for only six months. The 2009 reductions appear to be part of a longer-term cyclical decline from the peak in 2004. Earlier short-term examinations of the carbon tax claim that the policy has reduced greenhouse gas emissions by a total of between 5 and 15 percent. But this assessment overstates the short-term decline and ignores the reversal in more-recent years.*

A longer time frame tells a different story. (See Figure 1.) During the years that the tax was in place for the entire



SOURCE: F&WW analysis of Government of British Columbia Summary of GHG Emissions, 1990-2014.

The British Columbia Carbon Tax: A Failed Experiment in Market-Based Solutions to Climate Change

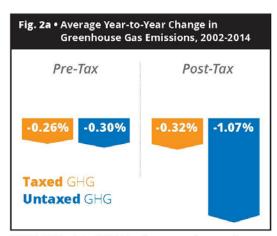
^{*} It largely depends when the change is measured: The taxed emissions decline was more than 10 percent from the 2004 peak to 2012, but that includes many falling years before the carbon tax was enacted; the decline was 2.2 percent from 2008 to 2014, but the tax was in effect only for the second half of 2008.

year, from 2009 to 2014, greenhouse gas emissions from taxed sources rose by a total of 4.3 percent.²⁰ During this same time period, emissions from non-taxed sources fell by a total of 2.1 percent.

The one-time drop in emissions from 2008 to 2009 does not appear to be driven by the carbon tax. The average annual year-to-year change in taxed greenhouse gas emissions barely changed after the carbon tax went into effect. (See Figure 2a.) Before the carbon tax was in effect, the categories of greenhouse gas emissions that would be subject to the tax fell by 0.26 percent annually from 2002 to 2008, but after the tax went into effect, from 2008 to 2014, the taxed greenhouse gas emissions declined by 0.32 percent annually — a modest difference that likely reflects a longer-term downward trend.

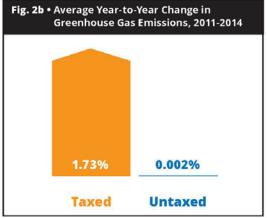
The average annual change in untaxed greenhouse gas emissions trended downward before the tax went into effect and continued downward after 2008, even though these emissions were not subject to the carbon tax. In the four most recent years, from 2011 to 2014, the total taxed greenhouse gas emissions rose by 5.3 percent while total untaxed emissions decreased by 2.5 percent, and the annual average growth for taxed emissions rose by 1.7 percent annually and exceeded untaxed emissions.† (See Figure 2b.)

Some carbon tax advocates claim that pricing mechanisms like the British Columbia carbon tax are only effective as long as the tax rate continues to rise each year. In British Columbia, the tax reached its peak of C\$30 per tonne in

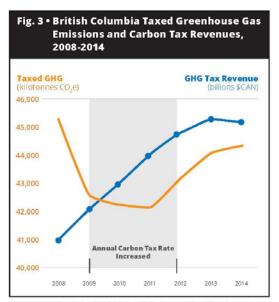


SOURCE: F&WW analysis of British Columbia government data; pre-tax from 2002/2003 to 2007/2008, post-tax from 2008/2009 to 2013/2014.

2012 with no subsequent increases in the following years. But even looking at these active tax years — from 2009 to 2012 when the tax was in place for the entire year and a tax increase was implemented that year — the British Columbia carbon tax failed to reduce emissions. (See Figure 3.) From 2009 to 2012 taxed emissions increased by a total of 1.51 percent, but untaxed emissions increased by a total of only 0.01 percent.



SOURCE: F&WW analysis of British Columbia government data.



SOURCE: F&WW analysis of British Columbia Budget and Fiscal Plan data and Government of British Columbia Summary of GHG Emissions, 1990-2014.

4

Food & Water Watch + foodandwaterwatch.org

[†] British Columbia released the 2014 data on greenhouse gas emissions in August 2016.

The taxed greenhouse gas emissions also appear to have risen as the carbon tax rate and carbon tax revenue rose. (See Figure 3 on page 4.) As the carbon tax rate and revenue rose after 2011, so did the taxed emissions. This challenges the theory that "pricing" the carbon emissions into the product through taxes would reduce emissions. By 2012 the tax rate reached its peak of C\$30 per tonne (US\$30.02 per tonne), but the taxed greenhouse gas emissions continued to rise.²¹

Ultimately, it appears that the British Columbia carbon tax has had no beneficial long-term impact on greenhouse gas emissions. British Columbia's *total* greenhouse gas emissions (as well as those covered by the carbon tax) have risen over the first six full years the carbon tax has been in effect. From 2009 to 2014, total greenhouse gas emissions rose by 2.2 percent. The volume of total emissions decreased for untaxed emissions (430 kilotonnes of CO_2e), and taxed emissions rose (1,808 kilotonnes of CO_2e). As the economy continues to improve, it seems likely that British Columbia greenhouse gas emissions will continue to rise.

Already, British Columbia projects that total greenhouse gas emissions will increase over coming years even with the tax in place. ²² Canada's 2016 biennial report on climate change estimates that the province's greenhouse gas emissions will increase by 7,000 kilotonnes of CO_2e (about 12.5 percent) between 2005 and 2020, and by 18,000 kilotonnes of CO_2e (about 29.7 percent) between 2005 and 2030 — preventing British Columbia from meeting its goal of reducing greenhouse gas emissions 33 percent below 2007 levels by 2020 by a wide margin. ²³ In 2016, British

Fig. 4 • Total British Columbia Vehicle Gasoline Sales, 2000-2015 (billions of gallons)

1.4
1.3
1.2
1.1
1.0
Carbon Tax Enacted
2000 2008 2015

SOURCE: F&WW analysis of Statistics Canada. Table 134-0004 Supply and disposition of refined petroleum products, monthly (cubic meters).

Columbia actually abandoned any mention of the 2020 target and is now looking toward a more distant target of reducing emissions 80 percent below 2007 levels by 2050.²⁴

Motor fuel sales rise steadily despite carbon tax

Motor fuel sales have trended upward since the carbon tax took effect, casting significant doubt on whether the tax has been an effective tool at curbing greenhouse gas emissions. Transportation fuel accounted for more than half of the taxed greenhouse gas emissions, and gasoline and diesel motor vehicle fuel represented more than two-fifths of the taxed emissions, making it a good proxy for the impact of the carbon tax on emissions.²⁵

Total motor vehicle fuel sales in British Columbia have generally risen since the carbon tax went into effect — sales exceeded those in 2008 for every year except 2012. (See Figure 4.) In recent years, motor vehicle fuel sales have exceeded the 2004 peak, even though the carbon tax reached its highest rate. In the seven years since the carbon tax took effect, from 2009 to 2015, total motor vehicle fuel sales rose 7.4 percent.²⁶



The British Columbia Carbon Tax: A Failed Experiment in Market-Based Solutions to Climate Change

Most studies by carbon tax proponents do not use total fuel sales data and instead use data contortions such as creating a metric for gasoline consumption per capita (using a per capita gasoline consumption metric minimizes the rising fuel sales with a rising population).‡ Although some of these same studies concede that it is not possible to conclude that the tax has caused reduced gasoline sales, the authors nonetheless proclaim that the carbon tax has been effective.² However, the increase in total vehicle fuel sales — including all gasoline and diesel consumption — is the best, most straightforward proxy for vehicle miles traveled and demonstrates that the carbon tax failed to curb one of the biggest sources of greenhouse gas emissions.

It is not surprising that the carbon tax had a negligible effect on gasoline consumption. People are dependent on their vehicles to travel to work and to attend to their family responsibilities. According to the Laval University in Quebec and the U.S. Energy Information Administration, gasoline prices have a minimal effect on car travel.²⁸ For example, despite significant volatility in U.S. gasoline prices in recent years, the total number of vehicle miles traveled and household car travel demand changed very little in response to price fluctuations.²⁹ Without sufficient alternative transportation options, people will continue to drive their cars regardless of significant changes in gasoline prices. The



Laval University researchers state that fuel consumption is not responsive to price and that a carbon tax in Canada should not have major effects on vehicle emissions.³⁰

Drivers in the United States have faced considerably larger gasoline price increases than the British Columbia carbon tax without reducing gasoline consumption or travel miles. ³¹ Even significant changes in gasoline prices have not had any real impact on vehicle miles traveled and subsequent CO₂ emissions. ³² Between 2006 and 2015, the national U.S. average price for gasoline fluctuated from a 10-year low of US\$2.40 per gallon in 2009 and a 10-year high of US\$3.68 per gallon in 2012 — more than 50 percent higher than only four years earlier. ³³ However, total vehicle miles traveled in 2012 were actually above mileage in 2009 (2,938.5 billion miles and 2,934.4 billion miles, respectively), despite gasoline costing US\$1.28 more per gallon. ³⁴

Debunking the pricing proponents' misleading claims

The straightforward data assessment demonstrates that the British Columbia carbon tax has not had a long-term impact on greenhouse gas emissions or gasoline consumption trends, since both have resumed their rise after a brief decline. Carbon tax proponents have overstated the results of the policy (primarily by focusing on a narrow time frame) and have over-attributed the causal impact of the carbon tax even on the short-term declines in greenhouse gas emissions and vehicle fuel sales.

Although greenhouse gas emissions and vehicle fuel sales declined as the carbon tax went into effect, most of these declines are more the result of the economic recession than of the carbon tax. Some of the 2008 to 2009 decline in greenhouse gas emissions was likely attributable to the decline in economic output³⁵ — companies going out of business, rising unemployment and falling disposable income, all of which led to less energy use.³⁶

British Columbia's environment minister at the time estimated that two-thirds of claimed emissions reductions between 2007 and 2010 were likely due to the economic recession.³⁷ In 2009, the first full year the carbon tax was in place, the entire country of Canada experienced a significant drop in greenhouse gas emissions, even though the majority of the country had not implemented

^{\$} Some studies by carbon tax advocates have found that gasoline sales have declined, but to reach a conclusion that contradicts the aggregate sales data, the researchers have employed data contortions, such as creating a metric for gasoline consumption per capita, which can suppress apparent fuel sales by diluting consumption by non-driving populations (including children and older senior citizens).

S Canada stopped collecting vehicle miles traveled in 2010, and its new Canadian Vehicle Use Study does not currently provide provincial-level data.

a comparable carbon tax.³⁸ As the economy improves, greenhouse gas emissions are likely to rise even with the carbon tax in place. Indeed, from 2011 to 2014, the British Columbia economy grew 4.8 percent and taxed greenhouse gas emissions rose 5.3 percent.³⁹

Moreover, the carbon tax was only one small part of British Columbia's policy suite targeting greenhouse gas emissions. One other policies implemented include Acts for Greenhouse Gas Reduction Targets, Cap and Trade, Emissions Standards, Renewable and Low Carbon Fuel Requirements, Vehicle Emissions Standards, the Local Government (Green Communities) Statutes Amendment, the Utilities Commission Amendment, Clean Energy, Energy Efficiency and Zero Net Deforestation. The procarbon tax studies attribute all of the short-term emission reductions to the carbon tax alone. It is far more likely that the carbon tax may have contributed only some part — perhaps a minimal part — of the already modest, overall emission reductions.

Not only do the pro-carbon tax studies fail to establish a causal link between the application of the carbon tax and the short-term declines in emissions and vehicle fuel sales, but also many of the studies have methodological flaws that further overstate the purported benefits of the carbon tax. Even recent studies tend to focus on a narrow time frame of emissions instead of on the full data available on greenhouse gas emissions between 2008 and 2013, and now 2014 with the recent release of new data.43 The studies that highlight the decline in greenhouse gas emissions from 2008 to 2011 or 2012 ignore the reversal of the emissions trend since 2011. (See Figure 1 on page 3.)44 Other studies ignore the aggregate province-wide emissions or vehicle fuel sales and calculate these values on a per capita basis, which depresses the rebounding greenhouse gas emissions and rising gasoline sales because of British Columbia's growing population.45

Some studies contended that the British Columbia carbon tax helped reduce greenhouse gas emissions in the province more dramatically than in the rest of Canada. ⁴⁶ But from 2005 to 2013 Ontario's electricity sector greenhouse gas emissions fell by 23,600 kilotonnes of CO₂e (a 68 percent drop), due largely to the closures of coal-fired electricity generation plants. ⁴⁷ Total emissions in Ontario decreased by 19 percent from 2005 to 2014, compared with only a 5.8 percent decrease in total emissions for British Columbia over the same period. ⁴⁸

Unlike British Columbia, Ontario did not have a carbon tax or price on carbon (via cap-and-trade) in effect at this



time — Ontario's regulation for its cap-and-trade market went into effect on July 1, 2016, and the first compliance period begins on January 1, 2017.* This basic comparison demonstrates that the mandatory replacement of fossil fuel energy plants with renewable, carbon-free forms of energy can rapidly and permanently reverse emissions trends. The British Columbia carbon tax instead made at most modest and short-term impacts on the province's emissions trend.

British Columbia carbon tax rebates favor businesses over lower-income households

Lower-income households bear the disproportionate brunt of carbon taxes that are levied on transportation fuel, electricity generation and residential heating. These energy costs represent a larger share of expenses for lower-income households, making the tax especially regressive. ⁵⁰ British Columbia aimed to reduce the regressive tendencies of the carbon tax and to make the policy more politically palatable by refunding these costs back to consumers (and businesses). ⁵¹ People would pay the tax at the gas pump, for example, but every three months they would receive a tax rebate. ⁵²

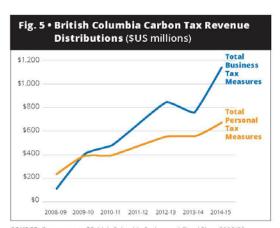
British Columbia's rebates fail to remedy the regressive nature of carbon taxes. The majority of the benefits of the rebate program have been shifted to businesses, not to individuals. But even if the rebates worked to rebalance the unfairness of the carbon tax, the very idea of rebates tends to contradict the theoretical justification for carbon taxes.

The taxes are supposed to send a price signal to discourage economic behavior that generates greenhouse gas emissions. If the added cost deterrent of the carbon tax is ultimately returned in the form of rebates, it weakens the price signal. At the outset, businesses and individuals

might reduce greenhouse gas emitting activity because of the tax, but the likely point-of-purchase effect will decline over time as people anticipate future tax rebates.

All of the revenue generated from British Columbia's carbon tax is returned back to its citizens through tax cuts and credits - a process known as "revenue recycling." (See Figure 5.)53 The carbon tax revenue is returned in separate categories to businesses and individuals (called "personal tax measures" and "business tax measures").54 The carbon tax also includes safeguards to protect lower-income individuals and families, such as low-income tax credits, a reduction in personal income taxes and rural homeowner benefits, among others.55 The British Columbia government estimates how the rebates get divided between businesses and individuals (which includes the lowerincome targeted tax provisions) annually, but there is no established formula to ensure that individuals receive a consistent and sufficient portion of rebates, and the actual revenue recycled can vary from the estimates.56

A large portion of the British Columbia carbon tax revenue has been paid directly by individuals: The greenhouse gas emissions from transportation, public electricity utilities and residential emissions that are paid primarily by individuals made up nearly half of the emissions covered by the tax. Furthermore, a portion of the costs of the other covered emissions — domestic airline fuel, commercial and institutional emissions, manufacturing and petroleum refining — were likely passed on to individuals in the form of higher consumer prices. Individuals ultimately shoulder the majority of the costs of the British Columbia carbon tax, and lower-income individuals would bear a disproportionate burden.



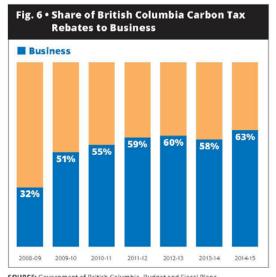
SOURCE: Government of British Columbia Budget and Fiscal Plans 2008/09 - 2018/19. Public Account Numbers. In U.S. dollars.

During the 2008/09 fiscal year when the carbon tax went into effect, individuals received the majority of the tax rebates (68 percent), but the British Columbia government rapidly shifted the rebates toward businesses in subsequent years. ⁵⁷ Within a few years, British Columbia awarded three-fifths of the carbon tax rebates to businesses. (See Figure 6.) ⁵⁸

By the 2014/15 fiscal year, British Columbia awarded 70 percent more carbon tax rebates to businesses (US\$1.14 billion) than to individuals (US\$673 million). Even a paper favorable to British Columbia's carbon tax recognizes that the rebates have diverged from the province's goal of remedying the regressive impact of carbon taxes on lower-income households and has instead "evolved into a system with some "industrial policy" objectives of promoting certain sectors. OA sthe carbon tax rate and revenue increased, British Columbia has failed to ensure that the tax rebates remain focused on individuals, especially the lower-income families that spend a greater share of their income on energy. As a result, this made the tax more regressive over time despite the tax rebates.

ExxonMobil carbon tax endorsement should give environmentalists pause

While the greenhouse gas-emitting fossil fuel industry continues to vehemently oppose any stringent regulation of greenhouse gas emissions, some of these companies have recently supported the principle of a carbon tax



SOURCE: Government of British Columbia. Budget and Fiscal Plans 2008/09 - 2018/19. Public Accounts Numbers.

approach.⁶³ In its statement on the 2015 United Nations climate talks in Paris, ExxonMobil endorsed a carbon tax as "the best option" to address climate change and to achieve, among other policy goals, "let[ting] market prices drive the selection of solutions."⁶⁴

Those genuinely concerned about implementing effective policies to address climate change should be skeptical of a carbon tax approach endorsed by ExxonMobil. For more than a quarter century, ExxonMobil concealed its own scientific knowledge of fossil fuel-induced climate change and funded scientists, think tanks and lawmakers denying the human impacts of climate change. ExxonMobil now publicly acknowledges the real threat of climate change, but what is driving ExxonMobil's support of a carbon tax? The short answer is that market-based pricing schemes such as the British Columbia tax have no impact on ExxonMobil's production and profits.

ExxonMobil believes, with good reason, that there is no political will among governments to implement a cap on emissions that would achieve a low-carbon scenario that prevents the acceleration of atmospheric CO₂ levels. ⁶⁶ In 2016, ExxonMobil stated that, "world climate policies are 'highly unlikely' to stop it from producing and selling fossil fuels in the near future."

ExxonMobil also understands the practical economic roadblocks to effective carbon pricing policies, notably that meaningful carbon taxes would be astoundingly high. In a comment to the *Houston Chronicle*, ExxonMobil's manager of environmental policy and planning said that, "Trimming carbon emissions to the point that average temperatures would rise roughly 1.6 degrees Celsius — enabling the planet to avoid dangerous symptoms of carbon pollution — would bring costs up to \$2,000 a ton of CO₂. That translates to a \$20 a gallon boost to pump prices by the end of this century..." These price increases would represent an extraordinary and unmanageable burden for average Americans. By 2090, carbon taxes would add about US\$23,177 (in 2016 dollars) to household energy costs.

ExxonMobil is in no hurry to help solve our climate crisis, stating that "all economic energy sources will be necessary to meet growing global demand, and the evolution of the energy system toward lower atmospheric emissions will take many decades due to the energy system's enormous scale, capital intensity, and complexity." ⁷⁰ It seems likely that the corporate supporters of carbon taxes are betting that they can continue business as usual under the carbon tax with little impact on their operations.

Unfortunately, we do not have several decades to confront climate change. A 2016 study found that without a transition to renewable or zero emissions from 2017 onward, global warming will irreversibly exceed a 2-degree Celsius global temperature rise starting in 2018.⁷¹

Summary

British Columbia's carbon tax has failed to change the province's long-term greenhouse gas emissions trends or to reduce gasoline sales. The short-term decline in emissions was not likely related to the tax and was rapidly reversed; taxed emissions have risen by a total of 5.3 percent in the four most recent years — faster than untaxed emissions, which actually decreased by a total of 2.5 percent. The billions of dollars in carbon tax revenue have been diverted increasingly toward corporations and businesses.

At best, the British Columbia carbon tax coincided with modest short-term reductions, but the decline was more likely related to the economic recession after the tax went into effect in 2008 than to the carbon tax itself. It is no wonder that multinational fossil fuel corporations, like ExxonMobil, favor carbon taxes as a "solution" to climate change. To these industries, carbon taxes have no impact on their day-to-day operations nor on their profits.

Ironically, it is just this feature that leads many economists to favor carbon pricing as a means of addressing greenhouse gas emissions. Economists claim that carbon pricing is the most efficient policy because it will limit the costs of reducing greenhouse gas emissions. Unfortunately, economic efficiency is not the rubric by which future generations will judge the success or failure of greenhouse gas emissions policies. Instead these policies will be judged on whether or not they generated decisive action to produce real, drastic reductions in greenhouse gas emissions fast enough to stave off the worst effects of climate chaos. If there is anything to be learned from British Columbia's experience, and that of other early carbon taxes, it is that carbon taxes cannot avoid those effects that loom just beyond 1.5°C of global warming.

It is increasingly evident that carbon taxes are really a form of "desperate environmentalism" — an apt phrase coined by Joshua Galperin, a Yale School of Forestry and Environmental Studies professor — which is "...characterized not by awe, enthusiasm and enjoyment of nature but by appeasement." Galperin continues, "From market-friendly cap-and-trade to profit-driven corporate social

responsibility, desperate environmentalists angle for the least-bad of the worst options rather than the robust and enforceable safeguards that once defined the [environmental] movement."⁷⁴

Strong and enforceable pollution standards work. Carbon taxes put the cost and responsibility of addressing climate change on individuals instead of holding polluters accountable for destroying our planet. And they are largely ineffectual, having little or no impact on greenhouse gas pollutants. Carbon taxes further endanger meaningful action to reduce harmful greenhouse gas emissions. The political capital and institutional engagement wasted in pursuing carbon taxes are a distraction from what is really needed: mandatory pollution reductions.

Recommendations and Conclusion

The solution to addressing climate change, in earnest, is not complicated: the amount of carbon dioxide entering the atmosphere and water must decrease significantly and rapidly. Incremental, gentle, polluter-friendly approaches, such as carbon taxes, will never bring about a stable and sustainable future. Instead, the public must demand that state and federal governments:

Transition to 100 percent clean, renewable energy by 2035. Electric power generation must be transitioned off of all fossil fuels, which should be kept in the ground. Investments in and build-out of solar, wind and truly clean sources must be prioritized.

Aggressively invest in energy efficiency programs to reduce overall energy needs and to create good-paying jobs. According to the Center for American Progress, retrofitting 40 percent of existing U.S. residential and commercial buildings "would mobilize a massive amount

of domestic labor, over half a million (625,000) sustained full time jobs over a decade."75

Implement and enforce mandatory pollution control measures, not weak pricing mechanisms. Landmark legislation like the Clean Air Act and Clean Water Act in the United States led to unprecedented improvements in air and water quality, and despite industry efforts to undermine these protections, they remain some of the strongest and most effective to date. Weak pricing measures cannot compete with mandatory pollution control measures.

The effects of climate change are real, they are serious, and they are already happening. Without significant concerted action, the costs and risks of climate chaos will surge and magnify. Carbon taxes cannot achieve meaningful changes to climate-destroying emissions. Investing time, energy and resources on such "desperate environmentalism" is neither an option nor a solution.

Data and Methodology

Food & Water Watch used publicly available data to report on British Columbia's carbon tax program. The primary data came from the Government of British Columbia Greenhouse Gas Inventory, Statistics Canada data on the Supply and Disposition of Refined Petroleum Products (Table 134-0004) and Government of British Columbia Budget and Fiscal Plans. To Taxed and untaxed carbon emissions are drawn from these tables and from the statutory definitions, and are determined based on the specifications of what is and is not covered under the tax. Finally, all tax revenues and tax rates are converted to U.S. dollars using the annual exchange rate provided by the U.S. Federal Reserve Board.

Endnotes

- 1 Elgie, Stewart and Jessica McClay. University of Ottawa. "BC's carbon tax shift after five years: Results, an environmental (and economic) success story." Sustainable Prosperity. July 2013 at 1; Murray, Brian C. and Nicholas Rivers. Duke University. "British Columbia's Revenue-Neutral Carbon Tax: A Review of the Latest 'Grand Experiment' in Environmental Policy." Nicholas Institute Working Paper 15-04. May 2015 at 17 to 18.
- Zeebe, Richard E. et al. "Anthropogenic carbon release rate unprecedented during the past 66 million years." Nature Geoscience. March 21, 2016; Doyle, Alister. "Carbon emissions highest in 66 million years, since dinosaur age." Reuters. March 21, 2016.
- 3 Pachauri, Rajendra K. et al. "Climate Change 2014: Synthesis Report." 2015. Geneva, Switzerland: Intergovernmental Panel on Climate Change at 64; Food & Water Watch (FWW) calculation based on: C. Le Quéré et al. Global Carbon Budget 2014. Earth System Science Data, Carbon Dioxide Information

- Analysis Center, U.S. Department of Energy. Available at doi:10.5194/essd-7-47-2015; Friedlingstein, P. et al. "Persistent growth of CO2 emissions and implications for reaching climate targets." Nature Geoscience. Vol. 7, Iss. 10. October 2014 at 710.
- 4 Pachauri et al. (2015) at 64; FWW calculation based on Le Quéré et al. and on Friedlingstein et al. (2014) at 710.
- 5 See 42 U.S.C. § 85 (1970); U.S. Government Accountability Office (GAO), "Climate Change: Expert Opinion on the Economics of Policy Options to Address Climate Change." GAO-08-605. May 2008 at Highlights, 20, 33 and 36.
- 6 See 42 U.S.C. § 85 (1970); See FWW. "Pollution Trading: Cashing Out Our Clean Air and Water." Issue Brief. December 2012.
- 7 GAO (2008) at Highlights, 20, 33 and 36.
- 3 Ibid. at Highlights, 20, 33 and 36; Cohen, Ken. ExxonMobil. "ExxonMobil on the U.N. climate talks." December 2, 2015. Available at http://www.exxonmobilperspectives. com/2015/12/02/exxonmobil-on-the-u-n-climate-talks/. Accessed April 4, 2016 and on file with FWW.

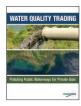
- 9 Murray and Rivers (2015) at 1.
- 10 Baumol, William J. "On taxation and the control of externalities." American Economic Review. Vol. 62, No. 3. June 1972 at 307 to 308; Metcalf, Gilbert E. and David A. Weisbach. University of Chicago Law School. "The Design of a Carbon Tax." Public Law and Legal Theory Working Papers. Working Paper No. 254. 2009 at 1
- 11 Metcalf and Weisbach (2009) at 1.
- 12 Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2013/14 – 2015/16." February 19, 2013 at 58; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2008/09 – 2010/11." February 19, 2008 at 11 and 13.
- 13 Government of British Columbia. Ministry of Finance (2008) at 13.
- 14 Government of British Columbia. Ministry of Finance (2013) at 58; Government of British Columbia. "Climate Leadership Plan." August 2016 at 2.
- 15 Government of British Columbia. Ministry of Finance (2008) at 11.
- 16 Ibid. at 11.
- 17 Ibid. at 15 to 20.
- 18 Government of British Columbia. Ministry of Finance. "Myths and Facts About the Carbon Tax." Available at http://www.fin. gov.bc.ca/tbs/tp/climate/A6.htm. Accessed August 30, 2016.
- 19 Murray and Rivers (2015) at 1 and 8 to 9.
- 20 FWW analysis of Government of British Columbia. "Summary of GHG Emissions, 1990-2014." August 2016 (see Data and Methodology at 10).
- 21 Government of British Columbia. "Climate Leadership Plan." August 2016 at 2.
- 22 Government of Canada. "Canada's Second Biennial Report on Climate Change." February 10, 2016 at 38.
- 23 Ibid. at 38; Government of British Columbia. Ministry of Finance (2013) at 58.
- 24 Government of British Columbia. "Climate Leadership Plan." August 2016 at 4; Government of British Columbia. "Discussion Paper: Climate Leadership Plan." July 2015 at 1, 5, 7, 9 and 13.
- 25 FWW analysis of Statistics Canada. Table 134-0004 Supply and disposition of refined petroleum products, monthly (cubic meters). Accessed April 4, 2016; Murray and Rivers (2015) at 8 to 9.
- 26 FWW analysis of Statistics Canada. Table 134-0004 (see Data and Methodology at 10).
- 27 Murray and Rivers (2015) at 8 to 9; Elgie and McClay (2013) at 1 to 2.
- 28 Centre for Data and Analysis in Transportation (CDAT) at Université Laval. "Gasoline Demand in Canada: Parameter stability analysis." Enerinfo Road Transportation. Vol. 15, Iss. 3. Fall 2010 at 2; Morris, Michael. U.S. Energy Information Administration (EIA). U.S. Department of Energy (DOE). "Gasoline prices tend to have little effect on demand for car travel." Today in Energy. December 15, 2014; Circella, Giovanni, Susan Handy and Marlon Boarnet. California Air Resources Board. "Impacts of Gas Price on Passenger Vehicle Use and Greenhouse Gas Emissions." Technical Background Document. September 30, 2014 at 2.
- 29 Morris (2014).
- 30 CDAT (2010) at 2.
- 31 FWW analysis of U.S. EIA. "U.S. All Grades All Formulations Retail Gasoline Prices." Available at https://www.eia.gov/dnaw/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_NUS_DPG&f=A. Accessed May 18, 2016; FWW analysis of U.S. Department of Transportation (DOT). Federal Highway Administration (FHA). "Travel Monitoring: Traffic volume trends." Available at https://www.fhwa.dot.gov/policyinfornation/travel_monitoring/tvt.cfm. Accessed May 18, 2016 (see Data and Methodology at 10); FWW analysis of Statistics

- Canada. "Table 326-0009 Average retail prices for gasoline and fuel oil, by urban centre, monthly (cents per litre)." Available at http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3260009. Accessed May 20, 2016.
- 32 FWW analysis of U.S. EIA. "U.S. All Grades All Formulations Retail Gasoline Prices"; FWW analysis of U.S. DOT. FHA. "Travel Monitoring: Traffic volume trends" (see Data and Methodology at 10); CDAT (2010) at 2.
- 33 FWW analysis of U.S. EIA. "U.S. All Grades All Formulations Retail Gasoline Prices."
- 34 Ibid.; FWW analysis of U.S. DOT. FHA. "Travel Monitoring: Traffic volume trends."
- Boivin, Jean. Bank of Canada. "The 'Great' Recession in Canada: Perception vs. Reality." Speech to Montreal CFA Society. March 28, 2011 at 2 to 3; Government of British Columbia. Ministry of Environment. "Climate Action in British Columbia: 2014 Progress Report." 2014 at 4; Bailey, Ian. "Economy plays key role in B.C. meeting greenhouse-gas targets." Globe and Mail (Toronto). June 28, 2012.
- 36 Grant, Tavia. "Why Canada's recession wasn't as brutal." Globe and Mail (Toronto). January 13, 2011.
- 37 Bailey (2012).
- 38 Government of Canada. Environment and Climate Change Canada. "Canadian Environmental Sustainability Indicators: Greenhouse Gas Emissions." April 2016 at 5.
- 39 FWW analysis of Statistics Canada. "Table 384-0038 Gross domestic product, expenditure-based, provincial and territorial, annual (dollars unless otherwise noted). Available at http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3840038. Accessed August 26, 2016; FWW analysis of BC Stats. "Table 1 British Columbia Population Projection 16/07 Summary Statistics." Available at http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationProjections.aspx. Accessed August 26, 2016; FWW analysis of Government of British Columbia. "Summary of GHG Emissions, 1990-2014."
- 40 Government of British Columbia. Ministry of Finance. "Myths and Facts About the Carbon Tax." Available at http://www.fin. gov.bc.ca/tbs/tp/climate/A6.htm. Accessed August 30, 2016.
- 41 Government of British Columbia. "Climate Action Legislation." Available at http://www2.gov.bc.ca/gov/content/environment/ climate-change/policy-legislation-programs/legislation-regulations. Accessed April 29, 2016 and on file with FWW.
- 42 FWW analysis of Government of British Columbia. "Summary of GHG Emissions, 1990-2014."
- 43 Murray and Rivers (2015) at 8 to 9.
- 44 Ibid. at 8 to 9.
- 45 Ibid. at 8 to 9; Elgie and McClay (2013); CBC News. "B.C. population outpaces national growth rate." February 8, 2012.
- 46 Komanoff, Charles and Matthew Gordon. "British Columbia's Carbon Tax: By the Numbers." Carbon Tax Center. December 2015 at 2.
- 47 Environment and Climate Change Canada. "National Inventory Report 1990-2013: Greenhouse Gas Sources and Sinks in Canada." Executive Summary. 2014 at 9.
- 48 Environment and Climate Change Canada. "National Inventory Report 1990-2014: Greenhouse Gas Sources and Sinks in Canada." Executive Summary. 2016 at 11 to 12.
- 49 Government of Ontario. "Cap and trade: program overview." Available at https://www.ontario.ca/page/cap-and-trade-program-overview#section-3. Accessed July 25, 2016; Government of Ontario. "Ontario's Five Year Climate Change Plan: 2016-2020." June 8, 2016 at 15.
- 50 Murray and Rivers (2015) at 12 and 18; Grainger, Corbett A. and Charles D. Kolstad. National Bureau of Economic Research. "Who Pays a Price on Carbon." Working Paper 15239. August

- 2009 at abstract, 1 to 2, 18 and 21; Dinan, Terry. Microeconomic Studies Division. Congressional Budget Office. Congress of the United States. "Effects of a Carbon Tax on the Economy and the Environment." May 2013 at 1 to 3, 8 to 9; Kolstad, Charles D. Stanford Institute for Economic Policy Research. Stanford University. "Who Pays for Climate Regulation?" SIEPR Policy Brief. January 2014 at 1 and 6.
- 51 Government of British Columbia. Ministry of Finance (2008) at
- 52 Government of British Columbia. Ministry of Finance. "Myths and Facts About the Carbon Tax." Available at http://www.fin. gov.bc.ca/tbs/tp/climate/A6.htm. Accessed August 30, 2016.
- 53 Ibid. at 14.
- 54 Government of British Columbia. Ministry of Finance (2013) at 61; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2016/17 to 2018/19." February 16, 2016 at 56
- 55 Government of British Columbia. Ministry of Finance (2008) at 11; Government of British Columbia. Ministry of Finance (2016) at 56
- 56 Government of British Columbia. Ministry of Finance (2008) at 14.
- 57 FWW analysis of Government of British Columbia, Ministry of Finance, Budget and Fiscal Plans from 2008 to 2015 (see Data and Methodology at 10).
- FWW analysis of Government of British Columbia, Ministry of Finance, Budget and Fiscal Plans from 2008 to 2015; Government of British Columbia. Ministry of Finance (2008); Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2009/10 to 2011/12." February 17, 2009; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2010/11 to 2012/13." March 2, 2010 at 105; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2011/12 to 2013/14." May 3, 2011 at 45; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2012/13 to 2014/15." February 21, 2012 at 66; Government of British Columbia, Ministry of Finance (2013) at 61; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2014/15 to 2016/17." February 18, 2014 at 64; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2015/16 to 2017/18." February 17, 2015 at 60; Government of British Columbia. Ministry of Finance (2016) at 56.
- 59 Government of British Columbia. Ministry of Finance (2016) at 56.
- 60 Murray and Rivers (2015) at 7.
- 61 *ibid.* at 18.
- 62 Ibid. at 18
- 63 Coalition of six major oil and gas companies. Letter to Her Excellency Ms. Christiana Figueres. Executive Secretary of the United Nations Framework Convention on Climate Change. May 29, 2015. On file with FWW; British Columbia industry. Letter to the Honorable Christy Clark. Premier of the Province of British Columbia. March 29, 2016. On file with FWW; Carbon Disclosure Project. "Investor CDP 2014 Information Request: Entergy Corporation." 2014 at CC2.3a; Anderson, Paul. Duke Energy. [Opinion column for Energy Markets]. "Grabbing the Carbon Elephant." June 1, 2005; Duke Energy. "Rogers, Other CEOS Put National Spotlight on Climate Change." December 11, 2014.
- 64 Cohen (2015).
- 65 Jerving, Sara et al. "What Exxon knew about the Earth's melting Arctic." Los Angeles Times. October 9, 2015; Gillis, Justin and Clifford Krauss. "ExxonMobil investigated for possible climate change lies by New York Attorney General." New York Times. November 5, 2015; Goldenberg, Suzanne. "ExxonMobil gave millions to climate-denying lawmakers despite pledge." The Guardian (U.K.). July 15, 2015.

- 66 Lewis, Sanford J. Attorney. Letter to Office of Chief Counsel. "Re: Shareholder proposal to ExxonMobil Corporation regarding stranded assets due to climate change policy on behalf of the New York State Common Retirement Fund." Division of Corporation Finance. U.S. Securities and Exchange Commission. February 22, 2016 at 3. On file with FWW.
- 67 Ibid. at 6.
- 68 Ibid. at 13.
- 69 Ibid. at 13. Bureau of Labor Statistics. U.S. Department of Labor. "CPI Inflation Calculator." Available at http://www.bls. gov/data/inflation_calculator.htm. Accessed March 24, 2016.
- 70 Cohen (2015)
- 71 Hannam, Peter. "Shift to zero-carbon power must start by 2018 to avoid extra warming: study." Sydney Morning Herald. April 1, 2016; Pfeiffer, Alexander et al. "The '2' C capital stock' for electricity generation: Committed cumulative carbon emissions from the electricity generation sector and the transition to a green economy." Applied Energy. March 24, 2016.
- 72 Cohen (2015); Wood, James and Chris Varcoe. "Oilsands, farms to be among exemptions from Alberta's carbon tax." Calgary Herald. March 24, 2016.
- 73 Galperin, Joshua. "'Desperate environmentalism' won't save the environment." Los Angeles Times. October 29, 2015.
- 74 Ibio
- 75 Hendricks, Bracken and Jorge Madrid. Center for American Progress. "A Star Turn for Energy Efficiency Jobs. Energy Efficiency Must Have a Starring Role in Putting America Back to Work." September 2011 at 2.
- FWW analysis of Government of British Columbia. "Summary of GHG Emissions, 1990-2014"; FWW analysis of Statistics Canada. Table 134-0004 Supply and disposition of refined petroleum products, monthly (cubic meters). Accessed April 4, 2016; FWW analysis of Government of British Columbia Ministry of Finance, Budget and Fiscal Plans from 2008 to 2015; Government of British Columbia. Ministry of Finance (2008); Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2009/10 to 2011/12." February 17, 2009; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2010/11 to 2012/13." March 2, 2010; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2011/12 to 2013/14." May 3, 2011; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2012/13 to 2014/15." February 21, 2012; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2013/14 to 2015/16." February 19, 2013; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2014/15 to 2016/17." February 18, 2014; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2015/16 to 2017/18." February 17, 2015; Government of British Columbia. Ministry of Finance. "Budget and Fiscal Plan: 2016/17 to 2018/19." February 16, 2016.
- 77 Government of British Columbia. Ministry of Finance (2008) at 13; Government of British Columbia. Ministry of Finance. "Myths and Facts About the Carbon Tax."
- 78 U.S. Federal Reserve. "Foreign Exchange Rates (Annual)." Federal Reserve Statistical Release. January 2, 2009; U.S. Federal Reserve. "Foreign Exchange Rates (Annual)." Federal Reserve Statistical Release. January 4, 2010; U.S. Federal Reserve. "Foreign Exchange Rates (Annual)." Federal Reserve Statistical Release. January 6, 2011; U.S. Federal Reserve. "Foreign Exchange Rates (Annual)." Federal Reserve Statistical Release. January 3, 2012; U.S. Federal Reserve. "Foreign Exchange Rates (Annual)." Federal Reserve Statistical Release. January 2, 2013; January 2, 2014; January 4, 2016.

More Food & Water Watch Climate and Environment Research



Water Quality Trading: Polluting Public Waterways for Private Gain

After over forty years of effective Clean Water Act control of many of our biggest sources of pollution, industries have finally found a way to evade meaningful and enforceable limits on their discharges. Water pollution trading — or water quality trading, as proponents call it — is allowing polluters to opt out of installing pollution reduction technologies and, instead, purchase pollution "credits" from other sources who may or may not be controlling their own discharges. This pay-to-pollute scheme is not only endangering our rivers, streams and lakes, but threatening the very underpinnings of our successful water quality laws.



The Truth About Offsets

Under cap-and-trade, polluters are offered the opportunity to "pay to pollute," turning decades of environmental efforts on their head and undermining improvements in environmental health. The linchpin of these cap-and-trade schemes is offsets, or credits from outside the regulated industry that polluters can buy in order to keep on polluting. But offsets are only a further loophole and avoidance of achieving real, additional and permanent reductions.



Dividend and Conquer: Cap-and-Dividend and Environmental Betrayal

Although cap-and-dividend avoids the pitfalls of trading credits and offsets, it still relies on a market solution for pollution that upends our commitment to stop pollution and protect our families and our environment. As with cap-and-trade, cap-and-dividend sets up a pay-to-pollute scheme whereby industry can simply purchase the right to degrade your land, air and waterways.



Bad Credit: How Pollution Trading Fails the Environment

For the past 25 years, emissions trading, known more recently as "cap-and-trade," has been promoted as the best strategy for solving pollution problems. But while existing pollution laws like the Clean Water Act call for the elimination of pollutants from our air and water, cap-and-trade begins by accepting the right of people to pollute and then paying them not to. Cap-and-trade substitutes economic abstractions that may or may not work for actual regulation and collective action to reduce environmental harm.

For more Food & Water Watch research, visit **foodandwaterwatch.org/library**



Appendix A - Comment Letters

COVER PHOTO (SEPTEMBER 2015): Melt caused by climate change is visible in the curving, receding view of Salmon Glacier ice and its exposed rocky ground. Salmon Glacier is the fifth largest glacier in North America, located north of Hyder, Alaska and Stewart, British Columbia on the Canadian side.

Food & Water Watch



National Office 1616 P Street, NW Suite 300 Washington, DC 20036 (202) 683-2500 foodandwaterwatch.org

HARD TO DIGEST: GREENWASHING MANURE INTO RENEWABLE ENERGY

ISSUE BRIEF • NOVEMBER 2016

Most food animals in the United States are grown on highly concentrated factory farms, and the vast amounts of waste those animals produce poses a huge environmental and public health problem. Historically, farmers used animal manure as fertilizer, but factory farms produce far more manure than can be used responsibly on local fields. The over-application of manure leads to runoff from agricultural fields into waterways. The runoff dramatically alters the ecosystem, contributing to algae blooms and "dead zones" as well as impacting fishing and recreation economies and public health.¹

Manure digesters have been offered up by agribusiness and policy makers as a way to turn factory farm manure into "renewable" energy. When animal waste is stored in pits and lagoons on factory farms, it releases methane, a potent greenhouse gas, and other air pollutants. Manure digesters capture the methane released by decomposing waste and burn it for energy. Promoted as a "win-win' for farmers, communities and the nation," these taxpayer-funded operations purport not only to reduce greenhouse gases but also to reduce environmental impacts associated with excess manure. "

In reality, these technologies have negligible impacts on the deep environmental problems caused by factory farms, and, if anything, serve to further entrench this disastrous method of food production. Indeed, the biggest and most obvious potential of taxpayer-subsidized manure digesters is to help sustain factory farms with new revenue streams from energy

production. Policy makers, instead of using taxpayer dollars to prop up factory farms, should be implementing and enforcing environmental and public health regulations for factory farms.

Digesting Waste

Factory farm production of cows, pigs and poultry generated 13 times more waste than the entire human population in the United States in 2012. The problem is often intensified in certain regions of the country where specific types of factory farms have proliferated, such as dairy operations in California. For example, in 2012, the factory-farmed dairy cows in Tulare County alone produced five times as much waste as the human population of metropolitan New York City.⁴

Many factory farms store their vast quantities of manure in pits or lagoons, where microorganisms digest the waste

1616 P Street, NW, Suite 300 • Washington, DC 20036 • foodandwaterwatch.org



More Than Just Manure: Other Feedstocks for Digesters

Digesters can produce energy from a variety of biomass material, and animal manure is one of the least productive source materials — largely because farm animals have extracted much of the available energy from the feedstock. Cow manure yields just over one-tenth as much biogas as food scraps, for example.10 One private consultant for biogas projects noted that the "manure-only" digesters will not attract investors because of inefficiencies. 11

Promoters of digesters, like the USDA, are considering ways to mix manure with better source material to improve fuel production, including building "community" digesters that accept a variety of biomass materials from multiple sources. ¹² The food waste from Disney World, for example, is fed with a mix of other biomass materials into a \$30 million facility in Orlando, Florida. ¹³

Trucking all of these materials to and from the digesters incurs significant fossil fuel use and presents risks of spills and accidents. And given the marginal energy potential of manure in digesters, it is not clear that this will be financially feasible — unless taxpayers subsidize the process. Creating a large, centralized facility that depends on a steady supply of animal manure to operate could also incentivize the construction of new factory farms in the area surrounding the digester, similar to the way a new slaughterhouse can drive the growth of factory farms in a region.

Just like manure lagoons without any methane capture system, digesters may accidentally spill or leak liquid manure and also present environmental risks from explosions associated with methane production. A 1.25 million gallon manure digester in Wisconsin, constructed in part with public funds, spilled 380,000 gallons of manure into nearby waterways in 2013, then another 22,000 gallons in 2014. The digester then experienced a major methane explosion. Faced with the reality of such dangerous accidents at digesters, along with other concerns, some rural residents have opposed the construction of digesters.

through a chemical process called "anaerobic digestion." The digestion produces "biogas," mostly a mixture of methane and carbon dioxide. The methane, the main component of natural gas, can then be burned to generate electricity or heat.

The most common manure-to-energy approach in the United States are manure digesters, designed to capture methane gas from these manure lagoons, which can be burned to produce energy. This approach is promoted as a good fit for many types of factory farms, which are already producing large volumes of manure and emitting methane, a powerful greenhouse gas.⁵

Manure digesters require a great deal of manure to generate energy, compared to other feedstocks, as the animal's own digestion has already broken down the food. That is why, according to an economic analysis by the U.S. Department of Agriculture (USDA), anaerobic digester systems that generate and sell electricity are not economically viable, as opposed to those that use the biogas as a replacement for natural gas for on-farm heating needs.

As of the fall of 2016, there were nearly 250 manure digesters in the United States, almost all of them located on dairy and swine operations. The U.S. Environmental Protection Agency (EPA) has noted that there are enough factory farms to potentially support the operation of more than 8,000 digesters. Such ambitious forecasting ignores the environmental and economic realities associated with this failed technology—and the inherent unsustainability of the factory farm model.

Manure Remains

Even factory farms that safely manage manure during methane capture still have to manage the huge volume of waste that remains following the digestion process. ¹⁶ Digesters do not make the nutrient loads (nitrogen and phosphorous) in the manure evaporate or disappear; they merely extract methane gas from the manure. In fact, if digesters add water to manure during the digestion process, the total volume of waste may actually increase. ¹⁷

Factory farms with digesters then resort to the same problematic waste disposal efforts that they have always used spreading the digested manure as fertilizer, leading to runoff from over-application. In fact, the process of digestion makes certain nutrients, such as nitrogen and phosphorus, more water soluble, meaning that rainwater is more likely to wash those nutrients from fields into nearby streams.¹⁸

Additionally, trucking tons of digested manure to surrounding farms incurs significant environmental costs associated with fossil fuel use and presents risks associated with spills. There are also economic costs involved in trucking tons of manure and digestate to and from digesters, and because of high transport costs, industry sources note that it is not always financially viable to utilize digested manure as fertilizer.¹⁹

Desperate to find a way to dispose of these mountains of manure, digester promoters are even exploring disturbing, new

applications, such as using digested manure as a nutrition source for animals.²⁰ In all, the USDA has committed \$10 million for research into manure digesters.²¹

Greenhouse Gases

Animal agriculture is a major contributor to climate change, with some studies estimating that livestock account for nearly 15 percent of human-caused greenhouse gas emissions globally. Much of this is in the form of methane, a greenhouse gas that is 25 times more powerful than carbon dioxide, emitted from factory farms that use anaerobic (oxygen-deprived) manure management approaches such as lagoons and pits. The EPA indicates that manure management on U.S. farms accounts for almost 10 percent of all human-caused methane releases in the United States.

Even more troubling, these emissions grew 65 percent between 1990 and 2013, which the EPA notes is related to larger and more concentrated dairy and swine farms using liquid manure management, such as lagoons.²⁶ The total number of livestock on the largest factory farms rose by 20 percent between 2002 and 2012. The number of dairy cows on factory farms doubled, and the average-sized dairy factory farm increased by half between 1997 and 2012. The number of hogs on factory farms increased by more than one-third, and the average factory farm size swelled nearly 70 percent from 1997 to 2012.²⁶

Anaerobic manure management practices chemically convert organic compounds found in waste into methane. By capturing and burning this methane, digesters purportedly offer a potential environmental benefit over traditional manure lagoons, both by decreasing greenhouse gas emissions and by producing energy that would offset fossil fuel consumption.²⁷

However, digesters do not offer clear environmental benefits over sustainable manure management practices, such as lower-density pasture-based animal production where manure decomposes aerobically (in the presence of oxygen) and becomes a natural fertilizer, releasing very little methane in the process.²⁸ This process involves no expensive machinery and no transportation of manure off the farm.

Given the various manure management practices available, digesters would appear to be the most expensive, most complicated way to reduce greenhouse gases produced from animal agriculture. And it is not clear that digesters actually reduce greenhouse gases.

Manure digesters do not capture all of the methane they produce, and some amount of methane that these facilities generate escapes as emissions. This "fugitive methane," as scientists call it, can offset a portion of the greenhouse gas reductions that digesters offer.²⁹ And when digesters burn methane, they release greenhouse gases like carbon dioxide and nitrogen oxide, which contributes to smog.³⁰

Factory farms using digesters have balked at even modest efforts by regulators to reduce this pollution. After regulators in California started requiring manure digesters to install

catalytic converters to reduce emissions of nitrogen oxide as a public health measure, factory farms loudly protested that such upgrades are too costly.³¹

Subsidizing Factory Farms

Manure digesters are an extremely inefficient method of energy production and likely would not exist in the United States were it not for taxpayer subsidies. Start-up, maintenance and operating costs are often in the millions of dollars, and digesters often do not generate enough energy or revenue to be economically feasible. 32

The USDA is a major proponent of both the factory farm model and manure digesters and has spent tens of millions of dollars helping factory farms purchase and install digesters. Other federal agencies and state government programs fund the construction of digesters as well. 44 Yet, the USDA notes that low energy prices in the United States mean that digesters, in most cases, do not make economic sense as sources of electricity alone. 45

The USDA and other promoters of digesters often present manure-based biogas alongside wind and solar as a source of green, renewable energy that can help the United States reach its goal of increased energy independence.³⁶ But this campaign to rebrand factory farms as being part of the green economy ignores the economic failures of this technology.

Digesters require significant energy to collect, pump and truck manure to and from the digester and to heat the manure once it is in the digester. As much as half of the energy produced from digesters may be needed to operate the digester itself. Sometimes factory farms do not even generate energy from all the available gas but simply "flare off" the biogas they produce, to reduce either odors or emissions. Sometimes factory farms do not even generate energy from all the available gas but simply "flare off" the

Because the manure is free and construction costs can be subsidized, factory farms have the potential to reap a major economic benefit, and some factory farms no doubt have

Digesters for Odor Reductions?

One widely cited benefit associated with digesters is their ability to reduce the noxious odors associated with factory farms. 48 USDA economists, noting the limited economic potential of digesters as energy producers, have observed that the odor reductions provided by digesters may create the necessary economic justification for constructing these very expensive machines. 49

However, it is not clear that digesters are effective at reducing odors. One government study from Wisconsin examined a variety of manure management practices and determined that "anaerobic digesters do not predictably reduce odors or ambient [ammonia] concentrations near manure storage lagoons. . . ."50

seen revenues increase with digesters. Overall, however, methane digesters have high failure rates.³⁹

For example, even though over a third of the funding for a \$900,000 digester on a dairy farm in San Diego County, California came from taxpayers, the EPA indicated that it was no longer in operation only a few years later. 40 It is perhaps unsurprising, as an independent analysis of start-up and maintenance costs indicated that, even accounting for grant funding, it would have taken 71 years for the digester to pay for itself. 41 As of spring 2016, the EPA indicated that 13 of 26 digesters that had been constructed in California, the nation's largest dairy state, had been shuttered. 42

One especially controversial funding mechanism that the USDA uses to subsidize digesters is the Environmental Quality Incentives Program (EQIP). Designed to improve the environmental performance of American agriculture, this program has been used increasingly to subsidize factory farms. An estimated \$750 million in EQIP funds was spent on manure management between 1997 and 2010, including helping factory farms construct manure pits and digesters.⁴⁹ The USDA also funds manure digesters through the Rural Energy for America Program (REAP), which has spent hundreds of millions of dollars to support biofuel projects.⁴⁴

Finally, promoters of poultry manure-to-energy technologies have distorted state and national energy policy to include this environmentally damaging technology as a source of renewable energy. And the construction of these expensive facilities almost guarantees the expansion of factory farms in the area, to produce the steady supply of waste to feed them.

For example, North Carolina, a leading poultry-producing state, passed an energy bill mandating that utility companies obtain at least 900,000 megawatt-hours of electricity from poultry waste by 2014, creating a major incentive for the construction of manure-to-energy technologies such as digesters or incinerators — and the expansion of factory farms to feed these expensive facilities.⁴⁵

Likewise, the state assembly in Maryland has designated energy produced from poultry litter facilities as a "Tier 1" source of renewable energy, on par with solar and wind. The implications of this decision are great because the state also has a mandate for electricity suppliers to generate 20 percent of electricity retail sales from renewable sources by 2022.46 As in North Carolina, poultry litter incinerators are being explored in Maryland, along with anaerobic digesters, to fix the problem of excess manure from locating too many animals in one area.⁴⁷

Conclusion

The political support for manure digesters and other manureto-energy projects makes the excess manure associated with factory farms seem like less of a problem, but manure digesters in fact do not address most of the problems that the manure causes. Seldom in the public policy debate is it acknowledged that if factory farms were not concentrating

Carbon Markets

Manure-to-energy technologies like manure digesters claim to reduce emissions of greenhouse gases such as methane and carbon dioxide. Some policy makers believe that farmers should be financially rewarded for providing this environmental benefit. One such mechanism exists in carbon cap-and-trade programs such as California's.

The program allows factory farms that use manure digesters to generate "carbon offsets," referring to the greenhouse gases that would have been emitted by the factory farm without the digester in place. Other highly polluting facilities, such as power plants, can then purchase the offsets so the facilities can emit more greenhouse gases themselves, rather than cleaning up their own facilities.⁵¹

These so-called "carbon markets" are rife with fraud, and it is difficult to verify that emissions actually are reduced. Moreover, offsets allow polluters to avoid the urgent need to stop polluting by allowing them instead to pay to continue harmful activities with impunity, while claiming that emissions have been reduced elsewhere.⁵²

The Brubaker Farm in Pennsylvania, for example, raises 30,000 pigs a year. Using taxpayer funds, the farmers built a manure digester to provide electricity for the farming operation and to sell back to the grid. SIN 2015, the California Air Resources Board certified the Brubaker digester as a greenhouse gas offset generator. The approval allowed a California energy company to claim offsets for the greenhouse gas reductions of the manure digester from the prior two years — so the energy company could keep polluting as normal, and the farm gets paid for environmental benefits it made already. The government provides grants for manure digesters in order to provide an environmental benefits are used as offsets that allow another facility to keep polluting, that purpose is defeated.



huge amounts of waste in one place, we would not need this expensive "solution."

The most common-sense improvement we can make to the environmental problems facing animal agriculture is to stop building new factory farms. We need policies that help smaller, independent and diversified farmers to thrive in a way that does not harm communities, the environment and public health. Until a shift to a more sustainable food system happens:

- The EPA and states should establish a moratorium on the construction of new factory farms and on the expansion of existing facilities. We will never solve the existing excess manure problem — and we will make it worse — if we do not stop the increased consolidation of the factory farm industry.
- States should strip animal manure out of State Renewable Portfolio Standards. Manure is a dirty source of energy that does not address the root of the problem: we need to diversify our highly concentrated milk and meat production system so that it is not producing unsustainable mountains

of manure. Instead of allowing states to meet their renewable energy mandates with dirty technologies that rely on the excess production of manure and enable continued concentration of too many factory-farmed animals in the same region, we need to incentivize clean energy production while creating a food economy that is good for everyone.

- Congress should eliminate other financial incentives for manure-to-energy technologies by making sure that the Environmental Quality Incentives Program no longer serves as a subsidy for factory farms by capping the size of payments that can be made to any one operation.
- The EPA and states should establish better and enforce existing air and water pollution laws, and not stand in the way of local government efforts to impose strict health and zoning regulations for factory farms.
- The federal government and states should not replace enforceable regulations to reduce factory farm pollution with market-based efforts that create pay-to-pollute schemes.

Endnotes

- Fahrenthold, David. "Manure becomes pollutant as its volume grows unmanageable." Washington Post. March 1, 2010.
- 2 Government Accountability Office (GAO). "Concentrated Animal Feeding Operations" (GAO-08-044) September 2008 at 7; Iowa State University and the University of Iowa Study Group. "Iowa Concentrated Feeding Operations Air Quality Study." February 2002 at 6.
- 3 U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA) and U.S. Department of Energy (DOE). "Biogas Opportunities Roadmap." August 2014 at 5; Key, Nigel and Stacy Sneeringer. "Climate Change Policy and the Adoption of Methane Digesters on Livestock Operations." USDA Economic Research Service Report Number 111. February 2011.
- 4 Food & Water Watch (F&WW). "Factory Farm Nation, 2015 Edition." 2015 at 3 and 8.
- 5 EPA AgStar. "U.S. Anaerobic Digester Status Report." October 2010 at 1; Intergovernmental Panel on Climate Change (IPCC). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Vol. 4 "Agriculture, Forestry, and Other Land Use." 2006 at 10.35.
- 6 Informa Economics. "National Market Value of Anaerobic Digester Products." Prepared for the Innovation Center for U.S. Dairy. February 2013 at 221-222.
- 7 USDA Natural Resources Conservation Service. "An analysis of energy production costs from anaerobic digestion systems on U.S. livestock production facilities." Technical Note No. 1. October, 2007 at 1, 4, 14 and 16.
- 8 EPA AgStar. Online database. Available at http://www.epa.gov/agstar/projects/ and on file at F&WW. Accessed September 16, 2016.
- 9 EPA AgStar. "Market Opportunities for Biogas Recovery Systems at U.S. Livestock Facilities." November 2011 at 1.
- 10 Informa Economics (2013) at 32.
- 11 Essential Consulting Oregon. "Dairy Manure Anaerobic Digester Feasibility Study Report." October 21, 2009 at 1.
- 12 EPA, USDA and DOE (2014) at 7 to 8.
- 13 Gunther, Marc. "World's biogas facility: a model for converting food waste into energy." Guardian. October 17, 2014; Simet, Anna. "Harvest power organics-to-energy facility on line in Fla." Biomass Magazine. March 3, 2014.

- 14 Verburg, Steve. "Blast destroys roof of troubled biodigester near Waunakee." Wisconsin State Journal. August 6, 2014.
- 15 Balsam, John and Dave Ryan. National Center for Appropriate Technology. "Anaerobic digestion of animal wastes: Factors to consider." ATTRA National Sustainable Agriculture Information Service. 2006 at 4 and 6; Fanelli, Joseph. "Methane fueled explosion at Aumsville dairy farm causes fire." Portland Oregonian. July 25, 2012; Kurtz, Jake. "Dane county manure digester put on hold." Waterloo Courier. December 24, 2013; Jessen, Holly. "Calif. plant surprised by opposition to anaerobic digestion." Ethanol Producer Magazine. June 16, 2011; Loria, Keith. "Iwofold renewable in Tulare County." Biomassmagazine.com. Available at http://biomassmagazine.com/articles/12396/twofold-renewable-in-tulare-county and on file at F&WW. September 22, 2015; "Residents ask DNR to deny digester air pollution permit." Waunakee Tribune (WI). July 24, 2015; Baird, Joel Banner. "Benefits of new GMP digester debated. Burlington Free Press. March 28, 2016.
- 16 Liebrand, Carolyn Betts and K. Charles Link. USDA Rural Development. "Cooperative Approaches for Implementation of Dairy Manure Digesters." Research Report 217. April 2009 at 4.
- 17 Penn State Extension. "Anaerobic Digestion: Biogas Production and Odor Reduction From Manure." At 1 and 4. Available at http://extension.psu.edu/ natural-resources/energy/waste-to-energy/resources/biogas/projects/g-77 and on file at F&WW. Accessed September 14, 2016.
- 18 USDA National Resource Conservation Service. "Anaerobic Digester." Conservation Practice Standard No. 366. September 2009.
- 19 Informa Economics (2013) at 51; Carreira, R. I. "How far can poultry litter go? A new technology for litter transport." Journal of Agricultural and Applied Economics. December 2007.
- 20 Veum, T. L. et al. "Methane digester effluent from swine excreta as a nutrient and water source for growing and finishing swine." Journal of Animal Science. Vol. 93, 1ss. 1. 2015 at 197.
- 21 EPA, USDA and DOE (2014) at 21.
- 22 Gerber, P. J. et al. Food and Agriculture Organization of the United Nations (FAO). "Tackling Climate Change Through Livestock." 2013 at xii
- 23 EPA. "Methane and nitrous oxide emissions from natural sources." (430-R-10-001.) April 2010 at A-2; IPCC (2006) at 10.35.
- 24 EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013. April 15, 2015 at 5-1.

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A – Comment Letters

- 25 Ibid. at 5-9.
- 26 F&WW. "Factory Farm Nation." (2015) at 3.
- 27 EPA AgStar (2010) at 1.
- 28 EPA (2015) at 6 to 7; IPCC (2006) at 10.35.
- 29 Flesch, Thomas K. et al. "Fugitive methane emission from an agricultural biodigester." Biomass and Bioenergy, 2011 at 3927; Sandars, D. L. "Environmental benefits of livestock manure management practices and technology by life cycle assessment." Biosystems Engineering, 2003. Vol. 84, Iss. 3 at 267.
- 30 EPA (2010) at A-2; IPCC (2006) at 10.49; Scherson, Yaniv. "Production of nitrous oxide from anaerobic digester centrate and its use as a co-oxidant of biogas to enhance energy recovery." Environmental Science & Technology. April 2014 at 5612; Lopez, Ricardo. "From waste to watts." Los Angeles Times. June 9, 2013; Combs, Amy. "The methane question." Santa Cruz Good Times. February 23, 2010.
- 31 Scherson (2014); Lopez (2013); Combs (2010).
- 32 EPA AgStar. "Funding On-farm Anaerobic Digestion." September 2012.
- 33 EPA AgStar (2010) at 2.
- 34 EPA AgStar (2012); EPA AgStar. "Funding On-Farm Biogas Recovery Systems: A Guide to Federal and State Resources." 2004. Available at https://www.epa.gov/nscep and on file at F&WW.
- 35 Lazurus, William. "Farm-Based Anaerobic Digesters as an Energy and Odor Control Technology." USDA Agricultural Economic Report No. 843. February 2008 at Abstract.
- 36 EPA, USDA and DOE (2014) at 9.
- 37 Ibid. at 10; Post, Tom. "Farmer uses methane to make electricity." Minnesota Public Radio News. June 27, 2008.
- 38 VanEgeren, Jessica. "Manure digesters seen as best hope for curbing lake pollution, but drawbacks remain." Capital Times (WI). April 30, 2014; Miller, Paul. "Methane recovery from manure: control odor and produce energy." Odor and Nutrient Management. Iowa State University Extension. EDC-129-7. Vol. 2, Iss. 3. Fall 1999.
- 39 Lusk, P. National Renewable Energy Laboratory. "Methane recovery from animal manures; the current opportunities casebook." (NREL/SR-580-25145.) September 1998 at 11 to 2; Katers, John and Ryan Holzem. "4 reasons why anaerobic digesters fail." Progressive Dairyman. June 29, 2015.
- 40 Krueger, Anne. "Farmers get charge out of cow manure." Union Tribune. July 24, 2005; EPA AgStar. Online database.
- 41 Western United Resource Development Inc. "Dairy Power Production Program; Dairy Methane Digester System Program Evaluation Report." PIER consultant report. February 2009 at 57 to 59. Actual costs listed as \$836,838 + \$30,000 = \$866,838, Minus grant funding of \$394,642 = \$472,196. Monthly maintenance costs listed as \$1,500/month or \$18,000/year. Revenues from net generation are \$24,613/year. 24,613/year 18,000/year = \$6613/year. 472,196 startup costs/6613/year = 71 years

- 42 USDA, National Agricultural Statistics Service (NASS). "California Agricultural Statistics: Livestock and Dairy." Crop Year 2013 at 68; F&WW analysis of EPA's AgStar database. Available at http://gispub4.epa.gov/AgSTAR/index.html and on file at F&WW-Accessed September 26, 2016.
- 43 Martin, Andrew. "Farm bill stinks for the meat industry and that's not entirely bad." Bloomberg. January 31, 2014; EPA, USDA and DOE (2014) at 13 and 21.
- 44 USDA. [Press release]. "USDA announces support for producers of advanced biofuel." December 2. 2014; USDA Rural Development. "The Impact of the Rural Energy for America Program on Promoting Energy Efficiency and Renewable Energy." March 2012 at 9.
- 45 USDA, NASS. "Poultry Production and Value: 2014 Summary." April 2015; North Carolina General Statutes § 62-133.7 (2007).
- 46 Maryland Energy Administration. "Plan to Increase Maryland's Renewable Energy Portfolio by 20% RPS by 2022." March 2010 at 2; Maryland S.B. 348, Chapter 135. "Renewable Energy Portfolio Standard - Tier 1 Renewable Source - Poultry Litter." 2008 at 1.
- 47 See: F&WW. "Poultry Litter Incineration: A False Solution to Factory Farm Pollution." October 2015.
- Fulhage, Charles et al. "Generating Methane Gas from Manure." University of Missouri Extension. 1993. Available at http://extension.missouri.edu/p/G1881 and on file at F&WW. Accessed September 14, 2016; Penn State Extension. "Anaerobic Digestion: Biogas Production and Odor Reduction from Manure." Available at http://extension.psu.edu/natural-resources/energy/waste-to-energy/resources/biogas/projects/g-77 and on file at F&WW. Accessed September 14, 2016.
- 49 Lazurus (2008) at Abstract
- 50 Wisconsin Department of Agriculture, Trade & Consumer Protection. Wisconsin Department of Natural Resources. "Final Report on Wisconsin's Dairy and Livestock Odor and Air Emission Project." September 2009 at 4.
- 51 Bartolone, Pauline. "California cap-and-trade paying off outside state, but not in Valley." Sacramento Bee. September 9, 2015; Subler, Scott. "Providing Carbon Credit Revenue for the Adoption of Lagoon Covers on Hog Farms in North Carolina and Dairies in New York, Final Report." Environmental Credit Corporation. December 22, 2011 at 3.
- 52 See: F&WW. "The Truth About Offsets." Issue Brief. May 2013.
- 53 Bartolone (2015).
- 54 California Air Resources Board, State of California Environmental Protection Agency. Offset Verification Statement. Ideal Family Farms Digester Project January 1, 2015.
- 55 Bartolone (2015).

Food & Water Watch works to ensure the food, water and fish we consume is safe, accessible and sustainable. So we can all enjoy and trust in what we eat and drink, we help people take charge of where their food comes from, keep clean, affordable, public tap water flowing freely to our homes, protect the environmental quality of oceans, force government to do its job protecting citizens, and educate about the importance of keeping shared resources under public control.



Copyright November 2016 by Food & Water Watch. All rights reserved. This issue brief can be viewed or downloaded at foodandwaterwatch.org.

Letter 93

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

April 10, 2017 Posted to: scopingplan2030

Mary Nichols, Chair California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Re: Proposed Final 2017 Scoping Plan Update: General Comments

Dear Ms. Nichols:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is an environmental non-profit advocating for the regional planning of transportation, land use and air quality, with a focus on reducing the impacts of transportation on climate change. We have previously submitted extensive comments (attached) on the failure of the draft Updates of the Scoping Plan to seriously address VMT reduction. These general comments on the Proposed Final 2017 Scoping Plan Update ("Update") are submitted together with TRANSDEF's companion letters on VMT reduction, the Environmental Assessment and regional targets. Page references are to the Update unless noted.

We heartily agree with the statement:

In developing this Proposed Plan, time matters. The policies that are included must lead rapidly to real results to avoid the most catastrophic impacts of climate change. The Proposed Plan identifies policies based on solid science and identifies additional research needs, while also recognizing the need for flexibility in the face of a changing climate. (p. 25.)

Transportation Funding

TRANSDEF was very pleased to read the Board's comments about the need to align the state's transportation funding with its climate goals. Because of induced demand, SB 1 highway expansion funding will result in increased VMT and increased GHG emissions. This funding bill demonstrates the unwillingness of entrenched forces to stop harming the climate and highlights a point TRANSDEF has consistently made: a profound shift in cultural values is needed before the major funding streams can be shifted to low-carbon transportation modes.

By approving SB 1, the Governor and Legislature have neutralized many of ARB's efforts of to reduce GHGs. They have further delayed the day when California's many levels of government start making coherent decisions to protect the climate.

Achieving Success

We strongly agree that:

However, to definitely tip the scales in favor of rapidly declining emissions, we also need to reach beyond State policy-making and engage all Californians. (p. 131.)

We think this is the most strategically important statement in the Update, but it is not given the prominence, resources and analysis that it deserves. TRANSDEF urges ARB to lead with this section, and include in it a robust and well-thought-out communications program. It ties in directly with the Board's transportation funding concerns.

Quantification

The inadequacy of the Update is apparent in the very first sentence of the Environmental Assessment:

This Draft Environmental Analysis (EA) is prepared for the California Air Resources Board's (ARB or Board) consideration of the Proposed Strategy for **Achieving** California's 2030 Greenhouse Gas Target (Proposed Plan). (EA, p. 1, emphasis added.)

Unlike the 2008 Scoping Plan's Table 2, neither the Proposed Final 2017 Scoping Plan Update ("Update") nor the EA presents a quantified demonstration that the recommended Greenhouse Gas Reduction measures **will achieve** the 2030 target. Without a quantified demonstration, it is invalid to claim that:

this Draft EA serves as a comprehensive, programmatic environmental analysis of the State's recommended GHG reduction measures to reach the 2030 target. (EA, p. 3.)

With its decades of preparing California's SIP, ARB clearly has the technical capability to demonstrate achievement. Table III-1, while a step in the right direction, fails to total those emissions or show how that total correlates with the total GHG reductions needed to meet the targets.

TRANSDEF asserts that the absence of a demonstration that its Update will achieve the targets mandated by AB 32 and SB 32 constitutes a failure to perform a mandatory duty, in violation of both of those statutes. It is a violation of the spirit of AB 32 and SB 32 for a plan that is mandated to achieve GHG emissions reductions targets to not analyze whether it achieves those targets. Separate CEQA thresholds of significance should be set for the failure to achieve the GHG targets mandated by AB 32 and SB 32.

93-1

Without a specific numeric emissions reduction goal assigned to each sector, it will be impossible to design or justify a specific package of emissions reduction measures, in those sectors prone to controversy.

TRANSDEF expects neither a crystal ball nor perfection in forecasting--only that ARB commit to providing numeric estimates for emissions reductions, exercising the same professionalism used in SIPs. Because TRANSDEF has no desire to delay the beneficial effects of the Scoping Plan, we would be satisfied with ARB's written commitment to publish within six months the full quantification of the emissions reductions from each of the measures in the Proposed Plan, in conjunction with a further commitment to revise the Update if achievement of the targets cannot be demonstrated.

Please note that TRANSDEF's companion VMT reduction letter points out in detail why the strategies identified in the Update and its attachments are insufficient to produce the desired 45% reduction in transportation GHG emissions. A "15 percent reduction in total light-duty VMT by 2050" (p. 105), for example, cannot be counted as a measure, both because its elements have not yet been defined, and because the potential strategies it relies on are inadequate. Only those measures that have been defined with enough specificity to permit the calculation of an emissions reduction estimate may count in a demonstration.

High-Speed Rail

Neither the Update nor the EA referenced *TRANSDEF v. ARB*, a challenge to the 2014 Scoping Plan's inclusion of High-Speed Rail ("HSR") as a GHG emissions reduction measure.

The Update makes no showing that HSR will achieve:

the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health & Saf. Code, § 38561, subd. (a)). (EA, p. 2.)

In fact, all evidence is to the contrary. Rather than achieve emission reductions before 2020, TRANSDEF has submitted evidence that the project will substantially increase GHG emissions for at least the first twenty to thirty years of operations. There is nothing remotely cost-effective about this project. It receives by far, the largest share of cap and trade funds, yet ARB has done no analysis of its cost-effectiveness.

The Update makes no showing that HSR will help achieve its #1 Project Objective:

for achieving the maximum technologically feasible and costeffective reductions in GHG emissions to reflect the 2030 target (Executive Order B-30-15 and SB 32, Statutes of 2016) (EA, p. 10.)

Regional Targets (EA, p. 65.)

One of the reasons for our call for a fully quantified update is our recognition of the failure of the 2010 bottom-up process of setting regional GHG emissions reduction targets by allowing them to be based on MPO suggestions. Because the call for Increased Stringency of 2035 Targets (EA, p. 12) will be politically challenging, there needs to be an overall top-down emissions reduction expectation (like the 5 MMTCO₂e that had been presented in Table 2 in the 2008 Scoping Plan) to work backwards from. That number can only be identified from a rigorously quantified plan.

Innovative Clean Transit (EA, p. 19.)

TRANSDEF believes ARB has harmed the ability of the transit industry to reduce GHG emissions through ARB's narrow focus on the motive power of transit vehicles. We see a substantial shift to transit modes as far more quantitatively important to the emissions of criteria and climate pollutants than is motive power. If innovative clean vehicles are made costly enough to impact the ability to expand service levels, the forest will have been lost in the trees.

More Stringent National Locomotive Emission Standards (EA, p. 20.) There is no longer any justification for EPA to allow full locomotive remanufacturing to Tier 0 standards, just because some technicality has been met, such as the preservation of the chassis of an outdated locomotive.

Land Use Strategies (EA, p. 27.)

ARB needs to reassert the finding of an extensive body of research, demonstrating that proclivity to use transit falls off sharply after 1/4 mile from a transit stop. The "within $\frac{1}{2}$ mile from transit centers" was brought into legislation by developers that wanted to free-ride on the acknowledged environmental benefits of Transit Oriented Development. The emissions benefits of TOD "within $\frac{1}{2}$ mile from transit centers" is far less than can be extrapolated from TOD within $\frac{1}{4}$ mile, and calculations should reflect that.

Alternative 2--Carbon Tax

TRANSDEF strongly supports a carbon tax for California, and looks forward to the expiration of the Cap and Trade program. We object to the staff's analysis of Alternative 2. The Alternatives Analysis is neither fair nor accurate:

Since the statutory direction on GHG reductions is definitive, the issue of certainty of reductions is paramount, and alternatives vary greatly as to the certainty of meeting the target. The year-over-year reductions under a Cap-and Trade Program, for instance, provide certain and measurable reductions over time; a carbon tax, while putting a price on carbon to be sure, may not be enough to drive reductions by altering behavior." (p. 32.)

A cap-and-trade program sets an emission cap so that the maximum allowable GHG emission level is known and

93-4

93-5

93-6

covered entities will have to reduce GHG emissions. With a carbon tax, there is no mechanism to limit the actual amount of GHG emissions either at a single source or in the aggregate, and a carbon tax requires entities to pay for all of their GHG emissions directly to the State. In other words, a cap-and-trade program provides environmental certainty while a carbon tax provides some carbon price certainty. There is no emissions limit with a carbon tax. (p. 50.)

A carbon tax has the same inherent flexibility of a cap-and-trade program, with the distinction that without a cap, a carbon tax option may not result in any emissions reductions for GHGs or other air emissions. (p. 59.)

TRANSDEF vehemently disagrees with the claim that Cap and Trade provides certainty. Legal difficulties and legislative renewal difficulties, leading to recent disappointing auction results, demonstrate the exact opposite of environmental certainty. If the Cap and Trade system is itself flawed, as was Europe's, or if it is gamed, it won't achieve its goal.

93-8

The drop in the price of natural gas has led to more improvement in air quality and more GHG emissions reductions, due to the shutting down of higher-cost coal-fired power plants, than possibly **any** environmental regulation ever. Market forces are tremendously powerful. If harnessed by a carbon tax with an appropriate escalator mechanism tied to GHG emissions trends, those forces will produce emissions reductions results.

The analysis of the efficacy of the Province of British Columbia's implementation of a carbon tax is deeply misleading on several fronts. BC set more aggressive emissions reduction goals for 2020 than California. (33% below 2007, compared to 15% below 2008 levels, respectively.) BC has already reduced its emissions more than California. The early years of its carbon tax have been a striking success.

BC's Climate Leadership Team has recommended annual carbon price increases going forward. BC has powerfully reduced GHG emissions while having minimal economic effects. This real-world success nullifies the objection that there is no certainty that a carbon tax can control emissions levels. There is no such thing as certainty in life—the very choice of "certainty" as a criterion sets up a false dichotomy.

A tremendous problem with cap and trade is the potential for sophisticated gaming. (Think of how Enron manipulated the California energy market.) A carbon tax, on the other hand, is very straightforward. It should be easy to catch bad actors. Cap and trade requires thousands of lawyers and investment bankers, which add tremendous cost to the emissions reduction process. A carbon tax is simple and inexpensive to administer and does not require an army of lawyers.

Tax proceeds could either be used similar to how the GGRF is used today, or the tax could be made revenue-neutral, by lowering other taxes. Another possibility is to return

the entire proceeds to taxpayers, to offset the increased cost of consumer goods. What's critical here is that current claimants to the GGRF not distort the decision-making process by using their influence to hold onto revenue streams. Opposition from the recipient sector was a major factor in the recent defeat of the Washington state carbon tax initiative.

Conclusion

TRANSDEF recognizes the difficulties faced by ARB in leading the charge towards low-carbon lifestyles. Now is the time to be bold and exercise leadership, especially when the incoming federal Administration denies the need for action against climate disruption. We implore the Board to direct staff to fill in the information and communications gaps identified herein, to educate the public and generate the public support needed to move California's institutions into the climate-supportive category.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn, President David@Schonbrunn.org Letter 2

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

April 10, 2017 Posted to: scopingplan2030

Mary Nichols, Chair California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Re: Proposed Final 2017 Scoping Plan Update: VMT Reduction

Dear Ms. Nichols:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is an environmental non-profit advocating for the regional planning of transportation, land use and air quality, with a focus on climate change. We have submitted extensive comments on the failure of the draft Updates of the Scoping Plan to seriously address VMT reduction.

The Proposed Final 2017 Scoping Plan Update¹ ("Update") won't work. It neither offers specific measures to proportionally reduce transportation's contribution of nearly half the state's GHG emissions, nor does it propose measures that are likely to be effective in doing so. While it would not be technically difficult to put together such a plan, approving it would be politically challenging. Nonetheless, wishful thinking is not a substitute for planning, especially when the purpose is to avert climate catastrophe.

We heartily agree with the statement:

In developing this Proposed Plan, time matters. The policies that are included must lead rapidly to real results to avoid the most catastrophic impacts of climate change. The Proposed Plan identifies policies based on solid science and identifies additional research needs, while also recognizing the need for flexibility in the face of a changing climate. (Update, p. 25.)

As regards VMT reduction, however, we see that ARB has abandoned this approach, apparently as a result of political considerations. Reducing VMT will involve profound changes to the culture of this heavily auto-dependent state. This difficult work has been pushed off into the indefinite future, contrary to the policy statement cited above. This is

a violation of the public's trust in your agency, and of its statutory mandate. ARB must be a truth-teller, especially when that truth is inconvenient.

The success of the Scoping Plan Update will ride on whether ARB's goal, a 45% reduction in transportation GHG emissions (2016 Mobile Source Strategy),² can be accomplished by 2030.

The scenario assumed a 15 percent reduction in total lightduty VMT in 2050, compared to baseline 2050 levels. **This would translate into light-duty VMT growth of only five percent by 2030**, compared to current growth rates of approximately 11 percent. (*Id.*, p. 37, emphasis added.)

This statement, due to its critically important policy implications, needs to be prominently featured in the Update, with clarification as to the base year and whether this is an annual or aggregate growth rate. This calculation should be the measure by which each of the state's efforts in the transportation sector is evaluated.

The Update and/or its Environmental Assessment³ sorely lacks a chart listing the VMT projections of all of its various county and regional jurisdictions, along with a statewide aggregation, and comparing that to the Vision Scenario plans in the Mobile Source Strategy. (p. 36.) Numbers are needed for groundtruthing.⁴ Without actual numbers, any discussion of VMT reduction strategies will be so vague as to be meaningless.

Over the last 60 years, development patterns have led to sprawling suburban neighborhoods, a vast highway system, growth in automobile ownership, and under-prioritization of infrastructure for public transit and active transportation. Local decisions about these policies today **can** establish a more sustainable built environment for the future. (Update, p. 27, emphasis added.)

The evidence so far, however, is that, despite ARB's best efforts, local decisions favor more of the same, resulting in continued VMT growth. According to the Federal Highway Administration, California's VMT in July and August 2016 was more than 6% higher than in 2015. Without strong requirements handed down by the state, there is no reason to believe local decisions will change.

We are struck by the Update's blithe inclusion of a "15 percent reduction in total light-duty VMT in 2050." (Update, p. 105.) The 5% growth limit cited above implies a 50% reduction in VMT growth by 2030. As we have written previously, there is nothing in the "Potential State-Level Strategies" ("Strategies") paper that could achieve such an overall reduction. Here are a series of reasons why there is ZERO possibility the Strategies will achieve the desired reduction:

The recent approval of SB 1 will provide billions of dollars for highway expansion in the guise of congestion relief. Induced demand will significantly increase VMT.

- There is no state-level leadership educating the public about the relationship between personal mobility and climate change, and inspiring Californians to consider lower-carbon lifestyles. Without this kind of leadership, the cultural change implicit in reducing VMT will be politically impossible. With leadership and education, the public may be persuaded that changes in daily driving behavior are worth making for the sake of our children and grandchildren.
- The Strategies ignore the tremendous inertia of BAU transportation policies and the powerful political influence of entrenched interests. Current transportation capital and operating funding patterns continue to focus on highways and so-called congestion relief, despite ARB-funded research pointing to the futility of such spending.⁶ The leadership in the Legislature seeks to continue the funding priorities of a pre-climate change era (SB 1). That continuation of status quo funding will fuel the growth in VMT, and starve the development of convenient alternative modes of travel that are essential to effective climate change mitigation.
- Despite all of ARB's work on climate, congestion management agencies adopting sales tax expenditure plans continue to act like they've never heard of SB 375 or climate change. The Strategies is silent on how sales taxes now make up roughly half of all transportation funding in the State, making it critical for the State to establish a legal framework where sales taxes must be consistent with State policy, focused on VMT reduction rather than "relieving congestion."
- The county where TRANSDEF is located, for example, is planning to seek a
 sales tax increase for transportation, based on polling residents on what they are
 willing to pay for. Polling will necessarily come up with answers that increase
 rather than reduce VMT, because residents are primarily concerned with the
 congestion that affects their daily lives, and don't understand the bigger picture.
- The Strategies is silent on a huge unanswered question in transportation: "When will agencies finally have to set aside their backlogs of capacity-building projects, and get with the climate change program?" Regional agencies use Committed Projects policies ("If it was in the last RTP, we don't reevaluate it--it automatically goes into the next RTP") as a means of locking in the status quo.
- In short, there is no commitment in county transportation planning to addressing the climate emergency--local agencies expect the State to do all the heavy lifting.
- The Strategies' approach to project selection is hopelessly naive: "Explore development and adoption of additional performance measures and targets to inform the selection of transportation capital projects." (Strategies, p. 2) Influence over project selection is one of the biggest political plums of elective office. Until project selection can be brought into alignment with state climate goals, VMT growth will continue to be out of control.
- Other problems with the Strategies paper are identified in TRANSDEF's September 2016 letter to ARB, attached.
- All together, these points identify the need for profound cultural change, for which ARB has yet to demonstrate an appetite.

93-9 cont.

TRANSDEF believes it is inappropriate for the VMT Reduction Strategies to be counted as "Known Commitments" (Update, p. 35) and be evaluated for their GHG emissions reduction potential, when they have yet to be adopted or even proposed. These Strategies were not part of the Project Description in the Environmental Assessment, and thus cannot be considered environmentally cleared, or part of the Update.

93-9 cont.

No state agency has yet articulated a consistent low-carbon pathway forward for transportation. TRANSDEF urges ARB to frame up a coherent policy on achieving VMT reduction, consistent with the quotations from its plans included herein, as Caltrans is not willing to do so. (A culture war is underway at Caltrans, and the BAU side is currently winning. See CTP 2040 section of attached comment letter.)

The Inherent Conflict Between Advanced Clean Vehicles and VMT Reduction While we are enthusiastic EV supporters, we recognize that the state is challenged by two distinct transportation problems: the need for a large reduction in GHG emissions from motor vehicles, and peak-period congestion in metropolitan areas. Local transportation agencies have been focusing on clean vehicles as their primary method of reducing GHGs, as a means of avoiding their responsibilities to reduce GHGs by implementing the systemic changes called for by SB 375.

TRANSDEF supports the phasing-out of clean air vehicle access to HOV lanes, so that this critical resource may be used exclusively to promote carpool and transit vehicle use by offering a consistent travel time advantage. A focus on mode choice, rather than vehicle motive power choice, will result in a far larger amount of emissions reductions.

Our solo-driving-based transportation system cannot cope with mass numbers of travellers. Peak-period travel is inherently different from off-peak travel: by its very nature, peak-period travel is mass transportation. While EVs are an excellent and fast solution for the GHG challenge, overly focusing on them would exacerbate the congestion problem. As long as population growth means more cars, California will continue the trend of increasing VMT and increasing congestion.

Conclusion

TRANSDEF recognizes the difficulties faced by ARB in leading the charge towards low-carbon lifestyles. Now is the time to be bold and exercise leadership, especially when the incoming federal Administration denies the need for action against climate disruption. We implore the Board to direct staff to propose goals and a menu of programs that will arrest California's increasing VMT, and lead to meaningful reductions in the near-term.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn, President David@Schonbrunn.org

Attachment

TRANSDEF September 2016 Comment Letter to ARB: Comments on Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT).

https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf (accessed 2/27/17) 2 2016 Mobile Source Strategy, ARB, p. 29,

http://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.htm (accessed 2/27/17)

3 Scoping Plan Draft Environmental Assessment, ARB

https://www.arb.ca.gov/cc/scopingplan/app_f_draft_environmental_analysis.pdf (Appendix F, accessed 2/27/17)

⁴ We note, for example, our skepticism as to the 11% growth number cited above. We observe that multiple counties have recently approved transportation plans showing 28% increases in VMT by 2040.

28% increases in VMT by 2040.

⁵ Part of: Vibrant Communities and Landscapes and Potential VMT Measures, ARB, https://www.arb.ca.gov/cc/scopingplan/app_c_vibrant_comm_vmt_measures.pdf (Appendix C, accessed 2/27/17)

⁶ Impact of Ulabura Committees and Landscapes and Potential VMT Measures, ARB, https://www.arb.ca.gov/cc/scopingplan/app_c_vibrant_comm_vmt_measures.pdf

⁶ Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, Susan Handy et al,

http://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf (accessed 2/27/17)

¹ Proposed Final 2017 Scoping Plan Update, ARB,

Attachment

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

September 26, 2016 Posted to: scoplan2030trnspt-ws

Mary Nichols, Chair California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Re: Comments on Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT).

Dear Ms. Nichols:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is an environmental non-profit advocating for the regional planning of transportation, land use and air quality, with a focus on climate change. We consider reducing VMT to be our primary mission. We strongly support ARB's efforts to design programs to achieve the state's GHG emissions reduction targets. We are proud that California wants to demonstrate to the world how to do it. We hope you find our outsider perspective as real-world transit advocates useful as you update the Scoping Plan.

We attended the public workshop on the Transportation Sector to Inform the 2030 Target Scoping Plan Update, and reviewed the Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT). While our comments primarily address that document, we also make comments on ARB's overall transportation strategy and incorporate by reference our 2015 comments on the Scoping Plan Update to Reflect the 2030 Target, as they are still entirely relevant. They are available at: https://www.arb.ca.gov/lists/com-attach/3-2030targetsp-ws-WmgCNFdnA2VSCwZz.pdf

The Paper's Fundamental Premise is Untrue

The frame for the paper is the presentation of potential additional strategies to reduce VMT. This necessarily implies the existence of effective strategies already in place. In reality, while the rhetoric of state and regional agencies now call for a reduction in VMT, their actual decisions--and especially their funding priorities--are still firmly stuck in the highway-focused mentality of the last century. The vast majority of funds allocated by the CTC goes to highways, and are likely to induce additional VMT. Many local jurisdictions reject any responsibility whatsoever for VMT, even in their rhetoric. (See 2015 comment letter.) The results to date of the highlighted existing strategies (SCS--

TRANSDEF 9/26/16 2

the other two have not even been implemented) are minimal at best. Local and regional plans continue to show sharply increasing VMT.

Twenty-five years ago, the State of Oregon adopted its Transportation Planning Rule, which directed its localities to better connect land use plans with transportation plans. That law, and its implementation, was highly successful. Oregon now has a significantly lower VMT per capita than the rest of the U.S. Until California does something farreaching like that, VMT will continue to increase with population.

TRANSDEF fully recognizes how controversial an effective program to reduce VMT will be. We surmise that the current dismal state of affairs in VMT reduction policy is the result of high-level decisions to avoid controversy. This "Potential State-Level Strategies" paper is clearly the product of such decisions, as it fails to propose any impactful strategies to reduce VMT, despite knowing what would work. It is curious that the senior agency officials that signed off on this paper publicly support VMT reductions while privately opposing the very policies that would actually accomplish them.

As environmentalists working for decades to reduce VMT, we would prefer candor from those officials, in the recognition that, essentially, this is an education problem. Most of the population continues to believe in the traffic fairy: If only we support the next sales tax or bond measure, the traffic fairy will make traffic congestion vanish. The public needs to be educated--by leaders it respects--that the time is coming to a close when it is possible in metropolitan regions for most residents to commute by solo driving.

Because the Potential Strategies paper does not confront this central problem of transportation, adopting the paper as-is into the Updated Scoping Plan will prevent the State from controlling its largest GHG emissions category, motor vehicles. A failure to control VMT almost certainly means a failure to achieve AB 32 and SB 32 goals.

Increasing Infill Development

The State needs to create a fundamental economic advantage for infill development, if it is serious about achieving results. Auto-dependent development--sprawl--should be strongly disincentivized by a stiff impact fee based on added VMT. This could possibly be structured as an indirect source mitigation fee. The fee needs to be high enough to take the profit out of sprawl development. (This is entirely equitable, since much of the profit in the sprawl business model comes from externalizing the cost of access.) The playing field for infill development needs to be more than just level--it needs to be tilted towards infill, to compensate for its inherent difficulties.

Adoption of legislation modeled on Oregon's Transportation Planning Rule would help Shift land use practices in a sustainable direction.

Infrastructure Investments

The fundamental problem in infrastructure is not "identifying and prioritizing projects." The problem is that transportation funding has long been a preferred vehicle for conferring political benefits. Projects consistently get funded not because of their merits, but because of their sponsors. This wastes vast amounts of scarce public capital. Until

TRANSDEF 9/26/16 3

that capital can be focused on the transit infrastructure needed to provide convenient alternatives to solo driving, VMT reduction will not happen. This will require a change in the expectations of politicians as to the scale of favors they are able to confer on their benefactors.

The paper's proposals for increasing transit mode share are not going to result in significant mode shift unless there is a sea change in where the bulk of the Stat's transportation funds are spent. The infrastructure section of the paper will not benefit VMT reduction unless its first policy is to eliminate funding for projects that increase VMT.

This writer is currently traveling in Switzerland, a country that has invested intensively in its rail infrastructure. It appears possible to get to anywhere in the country without a car. None of this is complicated or even all that difficult, once the political realization dawns that mobility in metropolitan regions primarily reliant on the automobile can only continue to decline. Switzerland, for example, has a unique investment-prioritizing process, which consistently seeks to optimize system performance by strategic incremental improvements.

Driverless Cars

It is understandable that desperate transportation planners would latch onto autonomous vehicle technology as a life raft in response to the sinking ship of auto mobility. However, they miss a glaring problem: making it easier for anyone, of any age, to "drive" solo will inevitably greatly increase VMT. Roadway congestion (and GHG emissions, supposedly) are the only limiting factors to the explosion of this technology.

The thought process behind "Continue to study and develop policies around driverless vehicle technology that promote sustainable and equitable land use and reduce VMT" Is completely backwards. Because the technology was developed to foster independent travel, it encourages unsustainable sprawl development. This section needs to be totally rewritten to express concern about the great harm this technology will do to the State's sustainability policies.

As an example of clear thinking on this technology, see: http://humantransit.org/2015/11/self-driving-cars-a-coming-congestion-disaster.html

Pricing

Yes, it's true that "Several extensive studies have found pricing to be among the most impactful long-term VMT and GHG reduction strategies for the transportation sector." Despite the fact that the Potential State-Level Strategies paper has no other impactful strategies to offer, it baulks on proposing any serious pricing (it's all study this and explore that...). All-lane highway pricing would do more for VMT reduction than anything else in the paper. If we recognize that highway congestion is the simple laws-of-supply-and-demand result of many decades of underpricing, it should be obvious that gradually increasing pricing will correct the market distortions over time.

TRANSDEF 9/26/16 4

It is equally obvious that pricing is politically terrifying. If we are at all serious about VMT reduction, we will inevitably end up having to deal with bringing the public along in implementing pricing, so why not start the discussion now? TRANSDEF advocated for two decades on the need to build convenient cost-effective transit, so that alternatives will be in place to give road users a choice of mode when pricing commences. MPOs like MTC have maximized the difficulty of a transition to a pricing regime by refusing to commit their resources that way. They were instead focused on policy disasters like Express Lanes.

Express Lanes are a Strategy to Increase VMT

By providing facilities for solo drivers to avoid congestion, Express Lanes encourage the very behavior this paper's strategies are meant to discourage. It would be hard to find a worse strategy for reducing VMT than "Develop additional highway express lanes" unless it would be to make this the top pricing strategy.

HOT lanes are an artifact of the capacity-is-everything mindset of the previous century. The myopia of that mindset, which sees solo driving as the basic module of transport, prevents its practitioners from recognizing that solo driving is the fundamental problem of transportation. Instead of the old way, contemporary planners need to see solo driving as a failure of community design.

High-Speed Rail

We incorporate by reference our oral and written comments and attachments on the 2014 Scoping Plan Update. In those comments, we provided evidence that the HSR project currently underway will result in a net increase in GHGs that will last through at least two decades of operations. ARB failed to independently review CHSRA's GHG analysis, resulting in the Chair endorsing a deeply flawed analysis. TRANSDEF is currently in litigation on this matter with ARB.

In short, unless HSR can be conclusively demonstrated to reduce GHGs in the long and short term, using comprehensive life cycle analysis methodologies, it cannot be included in the updated Scoping Plan as a GHG emissions reduction measure.

CTP 2040

The recently adopted California Transportation Plan 2040 failed to meet the legislative mandate of SB 391. (See TRANSDEF comment letter on the Draft CTP Guidelines, available at: http://www.dot.ca.gov/hq/tpp/offices/osp/ctp_files/comments/4DavidSchronnbrunn_Transdef.pdf) Perhaps the single most important action ARB can take to reduce VMT is to arrange for all State agencies to rescind their approvals of the Final Draft CTP 2040, and adopt the first public Draft CTP 2040 instead. That document did far more than "address" the 80% GHG reduction called for by law--it provided recommendations on how to get there.

Conclusion

TRANSDEF recognizes the difficulties faced by ARB in leading the charge towards low-carbon lifestyles. We appreciate this opportunity to comment on the Update to the Scoping Plan. We would be pleased to assist in the implementation of these ideas.

TRANSDEF 9/26/16 5

Sincerely,
/s/ DAVID SCHONBRUNN

David Schonbrunn,
President
David@Schonbrunn.org

Letter 3

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

April 10, 2017 Posted to: scopingplan2030

Mary Nichols, Chair California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Re: Proposed Final 2017 Scoping Plan Update Environmental Assessment

Dear Ms. Nichols:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is an environmental non-profit advocating for the regional planning of transportation, land use and air quality, with a focus on climate change. This letter incorporates by reference companion TRANSDEF's letters on the Proposed Final 2017 Scoping Plan Update and its VMT reduction approach (both submitted April 10, 2017), and 2017 Regional Targets (submitted March 22, 2017), all of which raised significant environmental issues despite not specifically addressing the Environmental Assessment ("EA"). All page number references are to the EA unless otherwise noted.

High-Speed Rail

Neither the EA nor the Update references *TRANSDEF v. ARB*, a challenge to the inclusion of High-Speed Rail ("HSR") in the 2014 Scoping Plan. With a decision pending in that case, and with HSR included as a measure in the Update, we reiterate our CEQA assertions here:

1. Under Impact 8.a, the EA failed to identify as significant impacts the GHG emissions resulting from the very large amounts of construction materials to be used by the HSR project. Rather than achieve emission reductions before 2020, TRANSDEF has submitted evidence (attached) that the project will substantially increase GHG emissions for at least the first twenty to thirty years of operations. The HSR project precisely fits the definition of an atypical project that requires a detailed analysis:

93-10

GHG analyses focus on operational phase emissions, as discussed below, unless the project is of a unique nature requiring atypical (e.g., large scale, long-term) construction activity levels (e.g., construction of a new dam or levee) for

which quantification and consideration (e.g., amortization of construction emissions over the lifetime of the project) may be recommended. (94.)

93-10 cont.

2. As acknowledged in the 2014 Scoping Plan, the project will not operate service until 2022 at the earliest. For that reason, and for the ones following, the project has thus changed since it was evaluated in 2008, requiring a new review of its emissions impacts.

Where applicable **and still valid**, information and analysis are drawn from these prior environmental documents for use in this Draft EA. (3, emphasis added.)

In the Final 2016 Business Plan, CHSRA's Peer Review Group states (p. 117) that "[T]he Authority is acknowledging that there are not sufficient existing funds to complete the southern leg [the connection from Bakersfield to Los Angeles]..." Thus, there is no longer evidentiary support for most of the claimed emissions reductions. See: http://www.hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf

Even if CHSRA provides interim bus service over the Tehachapis until funding is somehow located, there is no evidence to support the claimed ridership from L.A. to S.F. (or even to San Jose) under this plan, nor have the GHG emissions associated with bus service been analyzed. They are likely to more than offset any GHG emissions reductions associated with the HSR service.

See TRANSDEF comment letter on CHSRA 2016 Business Plan, attached.

3. After identifying the significant impact of construction GHG emissions, correcting the three excerpts of text below, and replacing the overly vague bold text below with a quantification, the most feasible and appropriate mitigation would be avoidance: Eliminate the HSR project as a measure in the Scoping Plan.

Overall, the Proposed Plan would result in substantial longterm GHG reductions, although certain aspects of the Proposed Plan would cause **comparatively small** shortterm GHG emission increases. (94.)

Therefore, construction-related GHG emissions are expected to be short-term and limited in amount. (94.)

Implementation of the Proposed Plan would result in environmental benefits that include an estimated reduction in GHG emissions. These benefits would be greater than a comparatively small level of GHG emissions related to construction and operation of facilities associated with the compliance responses, as described above. (95.)

93-11

Regional Targets (65.)

The EA recognized that MPO strategies to reduce congestion (by widening highways) can have adverse impacts on criteria pollutants:

...there may be some increases in localized exposure to TACs. For example, improvements to existing facilities identified in an RTP/SCS (e.g., road widenings, intersection or interchange improvements... (65.)

However, it failed to acknowledge the impact of induced demand: increased capacity leads to increased VMT, which leads to increased GHG emissions, a CEQA impact. Please revise the EA accordingly.

Even though the Environmental Assessment (EA) is a program-level analysis, it should be apparent that <u>any</u> program that adds new lanes for single-occupancy vehicles will, through induced demand, result in an increase in VMT and therefore, GHG emissions. It is therefore entirely appropriate, and critical for programmatic GHG emissions reduction, for the EA to find significant adverse GHG emission impacts resulting from the inclusion in the Plan of the following proposals in Appendix C, Potential State-Wide Strategies to Reduce Vehicle Miles Travelled:

- Develop additional highway express lanes under the authority of AB 194 that
 offer access to high-occupancy vehicle lanes to single occupant drivers willing to
 pay a toll, with related revenue supportive of road maintenance and improving
 multi-modal travel options on the corridor. (Appendix C, p. 4.)
- Explore creation of additional high-occupancy vehicle (HOV) and high-occupancy toll (HOT) lanes. (Appendix C, p. 5.)

Neither the additional revenue generated by HOT lanes, nor the fee charged solo drivers will adequately mitigate the increased GHG emissions impact of HOT lanes. The appropriate feasible mitigation for this impact would be avoidance, by deleting this text from Appendix C and identifying in the Impact.8a section that allowing solo drivers to access HOV lanes will create the significant impact of increased VMT and GHG emissions, because of the effect of induced demand.

With the new transportation funding for highway expansion in SB 1 just approved, a mitigation measure is especially needed: Avoidance of the impact is the preferred mitigation, by barring solo drivers from HOV lanes. TRANSDEF believes such an action is required by ARB's mandate, because transportation is the state's number one emissions sector:

Consider, to the extent feasible, the contribution of each source or category of sources to statewide emissions of GHGs (Health Saf. Code §38562, subd.(b)(9)) (11.)

93-12

SB 375 was intended to reduce regional emissions by changing how future transportation and land use projects interact:

Overall, MPOs are expected to meet new targets through actions that would reduce VMT... (65.)

While that may be ARB's expectation, it is not working out that way in practice. MTC's 2017 Final Preferred Scenario presentation for its Sustainable Communities Strategy stated that:

93-12 cont

Most of the Plan's GHG emission reductions will come from MTC's Climate Initiatives Program. Transportation and land use strategies are not enough to meet the climate goals of SB375, requiring the following additional programs: Transportation Demand Management, Alternative Fuel/ Vehicle Strategies, and Car Sharing and Vanpool Incentives. (Slide 19, emphasis added, http://mtc.ca.gov/sites/default/files/Final Preferred Scenario POWERPOINT.pdf)

Please revise the EA accordingly.

Autonomous Vehicles

TRANSDEF's comments on previous versions of the Scoping Plan presented a Jarrett Walker <u>article</u> suggesting that autonomous vehicles will result in increased congestion and VMT. For that reason, we disagree that the assertion that autonomous vehicles necessarily offer emission benefits:

93-13

... and emission benefits associated with increased transportation efficiencies, as well as the potential for autonomous vehicles and advanced transportation systems. (18.)

In addition, as transportation practitioners, we have no idea what is meant by "advanced transportation systems."

In addition, TRANSDEF believes the following description from the Strategies paper, Appendix C:

 Continue to study and develop policies around driverless vehicle technology that promote sustainable and equitable land use and reduce VMT. (Appendix C, p. 3)

93-14

to be a null set, in that there cannot be driverless vehicles that reduce VMT. At least two reasons why: Driverless vehicles enable individual mobility for the young, old and disabled, thereby increasing person-trips. Driverless vehicles would be travelling between trips for customers, thereby adding additional trips.

Transportation Demand Management (27-28.)

Allowing access to managed lanes by toll-paying solo drivers will increase regional VMT and GHGs, rather than reduce them. The EA should note this as an impact, and calculate emissions reductions accordingly.

93-14 cont.

Mitigation of Transportation Impacts (144-145.)

The EA is legally incorrect in suggesting that:

Potential impacts on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview. (144, with analogous statement at 148.)

93-15

It is ARB's duty under CEQA to identify those impacts, and place the mitigation responsibility on the project sponsor in a statement of overriding considerations. In addition, It is within ARB's authority and purview to mitigate these impacts by limiting eligibility of grants of GGRF and other funds to only those jurisdictions that fully mitigate their projects' climate impacts.

ARB's statewide scope makes the Scoping Plan an especially appropriate place to call attention to the possibility that the congestion impacts of the construction of transportation projects can easily outweigh the time-savings benefits of some projects.

The EA asserts that:

ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions." (145.)

93-16

This is incorrect. ARB has the authority to enact Indirect Source Mitigation Fees on new development as mitigation of a variety of impacts, which could be highly effective in changing the economic incentives in favor of infill projects, by removing the windfall profits from greenfield construction, which typically does not mitigate its transportation impacts. TRANSDEF formally proposes indirect source mitigation fees as a feasible mitigation for the VMT-increasing impacts of greenfield development, which lead to increased GHG emissions and regional traffic congestion.

As was stated above in reference to Appendix C, a mitigation measure should be included in the Impact 17.b (and 8.a) sections, Operational Impacts to Traffic and Transportation, to avoid the impact of increased VMT and GHGs, to not open HOV lanes to solo drivers.

Publication Issues

The EA does not list its mandatory findings of significance (169-171). It is not adequate to merely make reference to other EA Chapters.

93-17

The Table of Contents (i) is insufficiently detailed, presenting over 110 pages of impact analyses in Chapter 4 without any entries. This prevents researching a specific impact.

93-18

Conclusion

TRANSDEF appreciates this opportunity to suggest improvements to the Environmental Assessment.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn, President David@Schonbrunn.org

Attachments

TRANSDEF comment letter on 2016 CHSRA Business Plan, with attached TRANSDEF Analysis of CHSRA GHG paper, and Chester and Horvath study.

Attachment

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

April 18, 2016 By E-Mail to: 2016businessplan comments @hsr.ca.gov

Dan Richard, Chair California High-Speed Rail Authority 770 L Street, Suite 620 MS-1 Sacramento, CA 95814

Re: Draft 2016 Business Plan

Dear Mr. Richard:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is a non-profit environmental group dedicated to the regional and interregional planning of transportation, land use and air quality. Our focus is on reducing GHG emissions from transportation. TRANSDEF has long been actively involved in HSR, starting with commenting on the Draft Statewide EIR in 2004. We have been a party in all three *Town of Atherton* EIR challenges and the appeal. We continue to be conceptually supportive of HSR, but do not believe the CHSRA's project can be economically viable—or even can be built—due to its being designed to meet priorities other than transportation.

With this Draft Business Plan, the Authority has pretty much admitted there is no way it can build to Southern CA. The \$3.2 billion in projected monetization from the IOS (p. 64) is only a tiny fraction of the cost to complete Phase 1. With no likely sources of additional funding, the situation is grim. This moment requires courageous truth-telling and owning up to past mistakes. This Draft Plan is not that.

The Draft Business Plan repeatedly mentions bringing in the private sector early in the design process. That is what the Peer Review Group recommended. But it is not what was done. The private sector was not brought in for the most critical part of the design: route selection. The reason there is no private money in this project now is because the politically selected route is a money-loser. (Rail operators won't say that publicly for fear of retaliation.) HSR in California could be a moneymaking business if the route is optimized for operating profits, but political considerations and private interests have been foremost ever since CHSRA was formed. The public interest has been subverted.

TRANSDEF urges the Authority to consider the analysis contained herein, and put the project on hold. We continue to believe that the way forward is a Request for Proposals

that invites the private sector to propose their own route, environmentally cleared at State expense. A private sector-led project would have a completely different dynamic, and could potentially secure consensus support in the Legislature and Congress. If the drawdown were to stop immediately, Congress might be willing to reinstate the unused portion of the ARRA grant to a private sector-led project.

We note with dismay the Authority's overt contempt for the public. The complete irrelevance of public comments is evident in its announced adoption date for the Final Business Plan three days following the close of the comment period. We hereby incorporate by reference the 4/18/16 comments of the Train Riders Association of CA.

Initial Operating Segment

It did not help the Authority's flagging public support to put forward an IOS with a southern terminus in an orchard in Shafter. That decision led to news stories on The Train to Nowhere that wrote themselves. While the Chair has indicated that the Final Business Plan is likely to have a different terminus, the executive that signed off on the decision to put it in the draft deserves to be reprimanded for exceedingly poor judgment.

Greenhouse Gas Emissions

TRANSDEF produced an in-depth analysis of the 2013 GHG Emissions paper by CHSRA. (See Attachment 1.) It found many flaws, most notable of which was the failure to include the life-cycle emissions of the construction materials, especially concrete. TRANSDEF filed suit to challenge the Air Resources Board's inclusion of HSR as a GHG emissions reduction measure in the first update to the Scoping Plan. In addition, the suit asks the court to invalidate the appropriation of revenues from the Greenhouse Gas Reduction Fund to HSR. CHSRA is a Real Party in Interest in that case.

On the basis of evidence submitted to ARB (See Attachment 2), TRANSDEF concludes that HSR will be a net GHG emitter for at least the first twenty to thirty years of operations. It makes no sense to use the GHG Reduction Fund to build something that won't reduce GHGs for a long time to come. AB 32 recognized the need to get reductions early, when it can slow down movement towards the tipping point. That's when new feedback loops kick in and catastrophic climate change will become unstoppable.

Six years later, it is time for CHSRA to produce a credible GHG emissions analysis that considers all emissions related to the IOS (because that is the only part of the project that is claimed to be funded), using the ridership cited in the Business Plan. (Parenthetically, TRANSDEF notes its inability to suspend disbelief as to the projected ridership for the IOS. See discussion below.) The analysis should specifically determine which year of operations of the IOS the net GHG emissions will become negative. The study should be conducted by an identified author with appropriate credentials for the task.

Until we are convinced by a credible study, TRANSDEF will continue to assert that the current HSR project will be a net GHG emitter if built, and therefore should not receive cap and trade funds. Without cap and trade funds, it cannot access bond funds, making the project infeasible.

Ridership

The ridership projection from San Jose to the Central Valley seems unreasonably high, at about twice recent San Joaquin Amtrak annual ridership, for a trip that is significantly more expensive. It seems unlikely the market can support the pricing expected for HSR. If the projections based on stated preference surveys are to be believed, the documentation needs to confirm that the survey specifically asked about taking an HSR trip from San Jose to Fresno and a bus to Los Angeles. Asking about an HSR trip to Los Angeles would be irrelevant for projecting IOS ridership.

A brand new marketing direction is offered in this Business Plan: HSR is good for commuting to jobs in the Silicon Valley. This is laughable: The projected \$63 fare each way is not feasible for commuters, especially for people that are commuting because they can't afford to live in the Bay Area. And it is beyond ludicrous to use cap and trade funds to facilitate the construction of sprawl, which greatly increases GHG emissions. The 2005 Statewide FEIR had an inadequate treatment of growth inducement. It offered no meaningful mitigation measures such as incentives to local jurisdictions to make their future land use patterns compact. Disincentives to continued sprawl would be needed if the long-time pattern is to change. There is no legal basis to expect that "effective land use and transit-oriented development" (p. 46) will replace generations of sprawl.

Capital Costs

Public trust of CHSRA's reporting of capital costs hit a new low following the revelation of the secret PB memo. The attempt at damage control was not at all convincing. It appears to informed members of the public that impending large cost increases have been held back. Meanwhile, at least some of the reduction in Phase 1 cost estimates are the result of scope reductions, of which the \$1.5 billion reduction in funding for the Caltrain Downtown Extension is the most evident. Because it is a large enough number to be identified, but was not called out in Figure 1 of the Capital Cost Basis of Estimate Report, it appears that the \$5.5 billion in cost reductions is actually a net figure, masking cost increases in certain SCCs or sections.

TRANSDEF suggests that a productive way to repair the public's trust in the project and its management would be to release a master spreadsheet (in .xlsx electronic format) as a supplement to the Capital Cost Basis of Estimate Report. It would tracks the cost estimate for each project segment (identified by specific mileposts) through each of the various Business Plans, starting with 2012. Each item for each Business Plan should have a quantity and a unit cost. That way, it will be possible to see exactly what changes from Plan to Plan. In addition, it should be a working spreadsheet with formulas, including those for updating costs for inflation. This would make it possible to verify that the 2014 Business Plan capital costs were in fact the 2012 Business Plan costs, with an inflation adjustment. A thoroughly informative spreadsheet would clarify such things. Where significant changes occur, it would be helpful to have notes keyed to the cells. A dramatic change in the degree of transparency might make the project more credible.

Funding

While the 2016 Draft Business Plan appears to demonstrate the needed full funding for the IOS, that funding is a mirage. It relies on cap and trade funding all the way out to 2050. The expectation is to raise \$5 billion in bonds that are secured by the cap and trade revenues between 2025 and 2050. Those revenues are so speculative that it seems highly unlikely that money on that scale can be raised. Even if it can be raised, it would be very costly, as it would be treated as a junk bond.

It will also take several acts of the Legislature that are bound to be highly controversial: extending the life of cap and trade, putting funds into reserves to pay back the bonds, and pledging considerably more than HSR's 25% share of the funds. Without <u>all</u> the projected cap and trade funds, no pre-expenditure funding plan can qualify for bond funds. Without bond funds for construction, the HSR project cannot proceed. CHSRA will have to go out of business once the federal grant is spent.

Bookends

Bond funding for local projects in the north and south, known as the Bookends, cannot be released for construction. These projects include such projects as Caltrain electrification and grade separations in Southern California. Despite the Legislature having appropriated bond funding for them, they do not qualify for construction funding. To get the funding, a project would have to be part of a fully funded and environmentally cleared segment that will result in infrastructure that is HSR-ready and whose operations will be self-supporting financially. The Bookends can't pass these tests.

Urban Areas

In his April Senate Committee testimony, Chair Richard said trains would go 120 MPH through urban areas, presumably to lower the noise emitted by trains. However, it won't be possible to make the required travel time at that speed. Please show how you can keep the speed down and the speed up at the same time. Contrary to a statement made by HSRA communications staff, San Jose is <u>not</u> the heart of Silicon Valley.

Comments on Specific Pages

- 4. Where is the information on the estimated capital costs for each segment of the statewide high-speed rail system under PUC 185033(b)(1)(A)?
- 9. Cap and Trade funds are placed in the Greenhouse Gas Reduction Fund. They are not Greenhouse Gas Reduction Funds.
- 10 & 11. Cost estimates are not directly comparable. Some lower cost estimates are the result of downscoping. e.g., Elimination of \$1.5 Billion contribution to DTX.
- 12. Please provide ridership breakout by destination to enable evaluation of the significance of commuter traffic, the credibility of the long-distance estimates and the potential impacts of induced sprawl.
- 12. Investment of public dollars may be the predicate for private sector investment, but without private sector involvement in route selection, the risk is too high that the private sector will never get involved, leaving a stranded asset. The current HSR project is a political deal and not a transportation project.

- 30. The structure of 1A is intended to prevent the expenditure of funds that could result in a segment that is not complete. The ICS managed to escape that fiscal discipline, but will not escape it in the future, should there be an attempt to use the bond funds.
- 31. So far, the HSR system is <u>entirely</u> a public works project. As stated on p. 35, it is government owned and constructed, based on government decisions.
- 32. In seeking to achieve zero GHG emissions construction, the full lifecycle emissions of the materials used in construction must be included. They were not included in the 2013 GHG analysis done for the Legislature.
- 35 & 36 & 38. Bringing in an operator after the route has already been selected is far too late, if the intent is to have significant private sector investment.
- 39. The train operator needed to be involved in the most important planning decision: the route. It is insulting to the public to claim that the train operator must be at the forefront of business model development, when the political process distorted the route selection so badly as to make the project infeasible.
- 40. The key decisions most important to the private sector have already been made. The likelihood of getting future investment is small, because the route can be expected to perform poorly. Adequate ridership is very unlikely.
- 45. The logical way to secure private sector participation would have been to offer rail operators the ability to propose their own routes, with the assumption of ridership risk. Instead, CHSRA proposes to place 100% of the risk of the first \$21 billion on taxpayers. The Authority refused to consider route flexibility on an unsolicited proposal by SNCF America, which had the investment banking support to build the San Francisco-Los Angeles system. (See http://transdef.org/HSR/Private_Capital.html)
- 45. The assertion that HSR "will enable people to work at high-tech jobs in the Silicon Valley and San Francisco while having greater access to more affordable housing options in Central Valley..." is inconsistent with HSR as a profit-making business. Commuting is only viable with a subsidized public transit business model, because HSR is far more costly.
- 49. See above for a discussion of the packages of projects.
- 49. Greenhouse gases are not criteria pollutants that cause human health impacts. The cumulative global GHG emissions cause climate impacts, not direct health impacts. As a result, there is no relief provided to disadvantaged communities.
- 50. The Santa Fe Springs triple tracking may provide benefits to Amtrak and Metrolink, but isn't HSR supposed to have dedicated tracks here?
- 56. The cost estimate only covers access to 4th and King in San Francisco, which is not the terminus of the system. What is the total cost of Phase 1 to the Transbay Transit Center?
- 75. Does the inflation in O & M costs in Exhibit 7.16 portend future problems with ridership? The ridership model documentation is silent on whether this degree of inflation could eventually affect demand. It should not be assumed that price elasticity

remains constant. At some fare point, the elasticity has to hit a breaking point, resulting in a death spiral.

- 88. It would be appropriate to identify the program level risks of 1). the invalidation of cap and trade by the courts; 2) the invalidation of the HSR appropriation of cap and trade by the courts; and 3). the Legislature's inaction on extending cap and trade, and providing the necessary framework to enable securitization, which is the foundation of the Business Plan.
- 89. A major risk that remains unidentified is the absence of a regulatory structure for implementing 25 kv. overhead power on blended systems. There cannot be a Phase 1 without these rules, yet no proceeding is open at the CPUC.
- 89. The mitigations listed for declining shareholder support are unlikely to be effective. See transparency suggestion, above.
- 92. CHSRA petitioned STB for the preemption of CEQA. This should be listed as environmental risk mitigation. The uncertain future of preemption, on appeal both in federal court and in the California Supreme Court, is a risk that needs to be identified.
- 92. A major risk that remains unidentified in the Business Plan is the trackage right Union Pacific RR has on the Caltrain ROW. UP will have to give its permission for CHSRA to provide intercity rail service in the Corridor. Until an agreement is in place, CHSRA needs a fallback plan. We believe the fallback should be obvious, given TRANSDEF's past litigation.

Conclusion

In these comments and in the previous twelve years of advocacy, TRANSDEF has provided constructive suggestions for how to achieve a functioning and profitable HSR system in California. As we have continuously predicted, due to its non-viable business model, CHSRA is about to run out of money. TRANSDEF is always willing to meet with CHSRA staff and/or Board to assist in changing direction.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn, President

Attachments

- 1. Analysis of the CHSRA's GHG Report. TRANSDEF. 2014.
- 2. High-speed rail with emerging automobiles and aircraft can reduce environmental impacts in California's future. Chester, M. and Horvath, A. Environ. Res. Lett. 7 (2012) 034012.

Attachment 1

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

Analysis of the CHSRA's GHG Report

On July 1, 2013, the California High-Speed Rail Authority released its *Contribution of the High-Speed Rail Program to Reducing California's Greenhouse Gas Emission Levels* (June 2013). It is meant to fulfill the mandate contained in SB 1029 (the Legislature's authorization of HSR bonds for the Central Valley project) to provide "a report on the 'net impact of the high-speed rail program on the state's greenhouse gas emissions." However, the report fails to quantify the project's emissions and emissions reductions, thereby making an evaluation of the program's net impact impossible.

The report is obviously intended to counter the Legislative Analyst's budget report³ of April 2012, which concluded that the HSR project would result in a net increase in GHG emissions for the first 30 years of operations. Knocking down that report would open the door to funding HSR with cap and trade revenues. Interestingly, the CHSRA report never mentioned the LAO report and pretended it didn't exist. Someone must have concluded they couldn't win an argument on the merits.

Rather than dispute the LAO report, the CHSRA report claims to "detail[] the projected net greenhouse gas (GHG) emissions associated with the construction and operation of the high-speed rail system." However, the report offers no details of those emissions. If numbers were developed during the preparation of the report, they weren't included in the publication. This is a politicized promotional piece and not a science-based document. It is simply not credible and not responsive to the legislative mandate.

Update: The Governor's Budget Proposal

The Governor proposed that \$250 million in 2014-15 cap and trade revenues go to HSRA. He further requested that 33% of all cap and trade revenues starting with 2015-16 be continuously appropriated to HSRA. These many billions of dollars, if not well-spent by the HSR project, could threaten the effectiveness of the entire cap and trade program. Careful scrutiny of the HSR project's net GHG benefits is warranted.

Methodology

A disclosure on p. 17 invalidates the entire report: "The timeframe and activities analyzed and discussed in this report were for CP1 [the first phase of the current Merced-Bakersfield project]. As the project moves forward, direct GHG emissions calculations will be carried out for each subsequent construction package." The construction impacts of CP1 cannot be meaningfully analyzed in relation to the operational emissions

reductions calculations, because the latter pertains to the Initial Operating Section (IOS), which is ten times its length. No HSR operations are planned for CP1.

This is critical, because the report is actually comparing the emissions benefits of the IOS to the emissions costs of the one-tenth-as-long CP1. Completing the IOS would require funding the \$26 billion extension to the LA Basin, as well as building CP2, CP3, CP4 and CP5 [the remainder of the Merced-Bakersfield project]. Obviously, the net project emissions are going to be very different when the emissions arising from \$26+ billion of construction are added in.

Evaluating the HSR program's net impacts requires either the operational emissions reductions of CP1 or the construction emissions of the IOS. This report offers neither.

Summary of Findings

The following six so-called Findings are mere restatements of vague intentions, with no identified funding to implement them:

- Commitment to 100% renewable energy during operations
- Zero net greenhouse gas emissions during construction
- · Supportive transit and land use for greater cumulative benefits for the state
- · Plans to plant thousands of new trees across the Central Valley
- · Cleaner school buses and water pumps in Central Valley communities
- Agricultural conservation measures aimed at reducing Central Valley sprawl and preserving valuable agricultural land⁶

In addition, the report offers no evidence in support of the following two so-called Findings:

- Zero net greenhouse gas emissions during construction⁷
 There is no evidence to support this claim. No numbers whatsoever are offered for GHG mitigation activities. This is a classic "aspirational goal" rather than a finding on a plan to achieve one.
- Significant contributions to the State's goals embodied in AB 32 and SB 375⁸
 There is no evidence to support this claim.

Not only is there no evidence to support the following three so-called Findings, they are actively misleading, as they are entirely dependent on CHSRA receiving an additional \$26 billion to build out the IOS to the Los Angeles Basin. In addition, they will mislead non-technical readers because they appear to be findings on the project's net emissions impacts. Because they exclude the construction emissions of both CP1 and the IOS, they represent only one side of the emissions ledger.

- Greenhouse gas savings from the first year of operations increasing to over 1 million tons of CO2 per year within 10 years⁹
- Result in net GHG emissions diversions that, conservatively, are the equivalent of the GHG emissions created from the electricity used in 22,440 houses, or removing 31,000 passenger vehicles from the road.¹⁰

 Using methodologies consistent with state practice, an estimated 4 to 8 million metric tons of CO2 saved by 2030, as if the state turned off a coal fired power plant¹¹

As discussed below, this last assertion is also misleading because the 8 years of operations are being compared to roughly one year of such a power plant's emissions.

GHG Emissions Sources for High-Speed Rail System

The diagram on page 9 is the only rendition of emissions category totals in the report. Amazingly, there is no corresponding table. The diagram comes closer to identifying the net impact than anything else in the report. However, its use of graphic symbols instead of conventional chart bars makes it impossible to interpret quantitatively. It is unclear from the diagram (or its associated text) whether the symbols have any quantitative significance, and if they do, whether emissions totals are represented by the height or by the area of the symbols. This makes the diagram both useless and deceptive: it obscures more than it discloses. Given the central importance of this data, choosing this indecipherable diagram for its portrayal can only be interpreted as an act of bad faith.

Operational Emissions Reductions

This project has had a long history of challenges to the technical validity of the HSR ridership model and litigation about the hidden changes that were made to it that advantaged Pacheco ridership while penalizing Altamont ridership. Ridership is the key input to an analysis of operational emissions reductions. As will be discussed later, the GHG reduction benefits of the HSR project are very dependent on ridership. With the controversy surrounding the ridership projections, this net emissions analysis rests on a shaky foundation.

The most striking part of this section is the meaningless apples-and-oranges comparison between the annual emissions of a coal-fired power plant and the emissions reductions from 8 years of HSR operations. ¹² This is an attempt to invite positive identification with HSR by creating a "Coal Bad--HSR Good" dualism, a classic technique of promotion.

Construction Emissions

While the report uses standard methods to calculate the direct emissions resulting from construction, it entirely leaves out the emissions resulting from the acquisition of construction materials, and offers a weak justification that these emissions shouldn't be counted against the project:

Regarding the construction materials, for some it is possible to calculate the impacts over the material's life-cycle, from extraction through processing, use onsite, and disposal, and express those impacts in GHG emissions terms. Those GHG emissions are usually the reporting responsibility of the manufacturer, and in terms of a project GHG emissions

inventory, happen "upstream" and outside the boundary of the project.

For example, cement manufacturers in California are subject to ARB's Mandatory Reporting and Cap-and-Trade Regulations. These regulations require cement manufacturers to report their GHG emissions annually to ARB. The emissions from cement manufacturing count towards the statewide GHG emissions "cap." The GHG emissions covered under the "cap" are required to be reduced through emission controls or a limited amount (eight percent) may be offset through the purchase of ARB certified offset credits. ¹³

The problem is that these emissions from construction materials constitute a very significant part of the project's overall emissions, because of the huge amount of concrete called for in the plans. This amount is large enough to increase the cement manufacturing sector's statewide emissions, which makes the "count it upstream" approach entirely inappropriate when evaluating the project's net impacts.

Perhaps recognizing this, the next paragraph of the report acknowledges the appropriateness of including the emissions from construction materials in its analysis, yet withholds the data on the flimsy excuse that the data is not "precise" enough:

However, the Authority considers it important to disclose the GHG emissions that occur outside of the project associated with materials used during construction. These have not yet been quantified, due to the limitations of available information at this stage of project delivery. While it is understood that the rail infrastructure will consist, largely of aggregate, concrete, steel, rails, and ballast; the precise source and supplier of those materials is not yet known. Additionally, the precise quantities are not available, given the nature of the design-build procurement process... (emphasis added)¹⁴

This is a masterful exercise in appearing to be fair-minded while simultaneously holding back damaging information. It is obvious that in the course of putting the project out to bid, the Authority prepared estimates of construction material quantities. These estimates were the basis for the calculation of the direct construction emissions. The materials' emissions must be **huge** for the Authority to need to bury them with this kind of double-talk.

The Legislative Analyst's April 2012 report¹⁵ relied on a 2010 pioneering study by Chester and Horvath entitled *Life-cycle assessment of high-speed rail: the case of California.* ¹⁶ The study's 2012 update produced data that enabled this calculation: Infrastructure construction and operations contribute between 40% and 51% of the

CHSRA project's GHG emissions per person per kilometer travelled. This figure rises to near 100% of the emissions for the scenario with 100% renewable power, and falls to 32% when the train's capacity is nearly doubled. The paper found "CAHSR infrastructure construction effects are dominated by concrete use. Approximately 67% of CAHSR infrastructure emissions are the result of cement production for concrete use..."

This is the smoking gun: Construction materials (as well as infrastructure construction, if one doesn't assume the success of the zero net GHG emissions program¹⁹) make up a highly significant percentage of the project's overall GHG emissions. Leaving them out so compromises the net impact analysis as to render it worthless.

The Chester and Horvath study calculated the project's payback period, the point at which the emissions reductions from the substitution of auto and air trips (measured as Vehicle Kilometers Traveled, or VKT) with HSR trips equals the HSR project's GHG emissions, including its cumulative prior emissions:

The payback sensitivity reveals several important considerations for transportation planners and air quality policy makers. The cumulative plum-colored lines for the high, medium and low forecast figures show that the GHG payback will likely occur between 20 and 30 yr (D3) after groundbreaking, and acidification potential after 20–40 yr. However, payback is highly sensitive to reduced automobile travel. The 5.8 billion auto VKT displaced dominate emissions changes in the corridor and the effects from reduced air travel and CAHSR are small. The reduced auto impacts are significantly affected or dominated by lifecycle components, in particular, avoided vehicle manufacturing, vehicle maintenance and gasoline production. (emphasis added.)²⁰

Chester and Horvath are thus warning that any slip in ridership from currently predicted levels would delay the GHG benefits of HSR even further.

Double Counting

When evaluating statewide benefits, it is important that GHG emissions reductions calculations represent only the project's own properties. The model that was used, on the other hand, "also reflects the GHG emissions benefits of ARB's recent rulemakings including on-road diesel fleet rules, Pavley Clean Car Standards, and the Low Carbon Fuel standard." This means that the report's emissions reduction calculations overstate the benefits accruing to the HSR project.

Offset Activities

The only way the CHSRA's GHG Report is able to claim a net beneficial GHG impact is by buying offsets in the form of environmental mitigations, including construction mitigations, ²² and farmland protection. ²³ The strategy of the Cap and Trade program is

to purchase GHG-reducing offsets at the lowest cost per ton. There's something very odd about committing Cap and Trade funds to a project that increases GHGs, which then has to buy GHG-reducing offsets. It would be dramatically less expensive on a perton basis to fund the GHG-reducing projects directly. Buying these same offsets as part of a CHSRA project package is inherently far more expensive.

Conclusion

The report offers no numbers capable of serving as a basis for the conclusion that "the high-speed rail program will have a positive impact on reducing the state's greenhouse gas emissions."24 Instead, that conclusion "feels right' without regard to evidence, logic, intellectual examination, or facts"--the Wikipedia definition of Stephen Colbert's 'truthiness'.

Endorsements

The uncritical endorsements of the report by agency heads expose the depth of its politicization. It simply is not credible that sophisticated agency heads and their staffs failed to spot the profound flaws identified above. Brian Kelly, now Secretary of the State Transportation Agency, "reviewed and approve[s]" the report. 25 Mary Nichols, Chair of the Air Resources Board, "believe[s] the analysis is reasonable..."26 Instead of the comprehensive overview expected of someone of her subject matter expertise, she offered only superficial comments on the emissions reductions from mobility choices, and avoided construction emissions and offsets entirely. These two endorsements make it obvious that the Governor ordered his people to "make HSR funding happen" no matter what.

¹ hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_ 2013.pdf

² p. 13. (Unless otherwise noted, all references are to the report accessible at the URL

Legislative Analyst's Office, Funding Requests for High-Speed Rail, April 17, 2012, p.

⁴ p. 13.

⁵ Legislative Analyst's Office, Cap-and-Trade Auction Revenue Expenditure Plan, February 2014, p. 5

⁶ p. 6.

⁷ Id.

⁸ Id.

⁹ Id.

¹⁰ *Id*.

¹¹ Id.

¹² p. 11.

¹³ p. 14.

p. 14.

¹⁵ Legislative Analyst's Office, p. 8

¹⁶ Mikhail Chester and Arpad Horvath, Life-cycle assessment of high-speed rail: the case of California, Environmental Research Letters, January 2010.

¹⁷ Mikhail Chester and Arpad Horvath, High-speed rail with emerging automobiles and aircraft can reduce environmental impacts in California's future, Environmental Research Letters, July 2012, p. 5 [Interpolated from the chart data in Figure 1]

¹⁸ Chester and Horvath, 2012, p. 4. ¹⁹ pp. 13-15. ²⁰ Chester and Horvath, 2012, p. 9.

²⁰ Cheste 21 p. 19. 22 p. 13. 23 p. 15. 24 p. 20. 25 p. 1. 26 p. 5.

Attachment 2

IOP PUBLISHING

ENVIRONMENTAL RESEARCH LETTERS

Environ. Res. Lett. 7 (2012) 034012 (11pp)

doi:10.1088/1748-9326/7/3/034012

High-speed rail with emerging automobiles and aircraft can reduce environmental impacts in California's future

Mikhail Chester^{1,3} and Arpad Horvath²

E-mail: mchester@asu.edu and horvath@ce.berkeley.edu

Received 16 March 2012 Accepted for publication 2 July 2012 Published 26 July 2012 Online at stacks.iop.org/ERL/7/034012

Abstract

Sustainable mobility policy for long-distance transportation services should consider emerging automobiles and aircraft as well as infrastructure and supply chain life-cycle effects in the assessment of new high-speed rail systems. Using the California corridor, future automobiles, high-speed rail and aircraft long-distance travel are evaluated, considering emerging fuel-efficient vehicles, new train designs and the possibility that the region will meet renewable electricity goals. An attributional per passenger-kilometer-traveled life-cycle inventory is first developed including vehicle, infrastructure and energy production components. A consequential life-cycle impact assessment is then established to evaluate existing infrastructure expansion against the construction of a new high-speed rail system. The results show that when using the life-cycle assessment framework, greenhouse gas footprints increase significantly and human health and environmental damage potentials may be dominated by indirect and supply chain components. The environmental payback is most sensitive to the number of automobile trips shifted to high-speed rail, and for greenhouse gases is likely to occur in 20-30 years. A high-speed rail system that is deployed with state-of-the-art trains, electricity that has met renewable goals, and in a configuration that endorses high ridership will provide significant environmental benefits over existing modes. Opportunities exist for reducing the long-distance transportation footprint by incentivizing large automobile trip shifts, meeting clean electricity goals and reducing material production effects.

Keywords: life-cycle assessment, high-speed rail, transportation, greenhouse gas

Si Online supplementary data available from stacks.iop.org/ERL/7/034012/mmedia

1. Background

Deployment of new and more fuel-efficient transportation modes is expected in the coming decades. Next generation automobiles and aircraft are already entering the market.

3 Author to whom any correspondence should be addressed.

Despite major political and economic roadblocks in the United States, federal, state, and regional transportation and land-use planners are discussing high-speed rail (HSR) as a potentially better investment for future mobility. The discussion of new transportation options is often coupled with the identification of strategies to help reduce congestion and travel times. With increasing populations

1748-9326/12/034012+11\$33.00

© 2012 IOP Publishing Ltd Printed in the UK

¹ Civil, Environmental, and Sustainability Engineering, Affiliate Faculty, School of Sustainability, Arizona State University, USA

² Civil and Environmental Engineering, University of California, Berkeley, USA

M Chester and A Horvath

and long-distance transportation demand forecasts, HSR was made a centerpiece of the American Recovery and Reinvestment Act as a modal diversification strategy. While several corridors are under study, California in 2008 authorized \$9.95 billion in bonds for their 1200 km system and the state legislature recently approved funding to start construction. Engineering and planning work are already underway, with possible groundbreaking in 2013 (CAHSRA 2012). While many technical, legal, economic, community and political battles loom, the California HSR (CAHSR) Authority has made significant progress towards deploying the system, which will connect Sacramento, San Francisco, Los Angeles and San Diego. In addition to direct mobility benefits, CAHSR has the potential to reduce long-distance transportation energy consumption and air emissions, provided measures are taken to encourage high ridership, minimize construction effects, and establish clean electricity contracts (Chester and Horvath 2010).

To understand the comprehensive energy and air emissions effects of deployment and adoption of CAHSR, a life-cycle assessment (LCA) framework should be used to assess future modes in the California corridor. The energy and environmental tradeoffs of CAHSR have been examined with then-planned vehicles and fuels (Chester and Horvath 2010) by constructing a life-cycle inventory using information from CAHSRA (2005), the then-current design data and with groundbreaking expected around 2010. However, many new corridor plans and design considerations have been made warranting new outlooks for the system. Forecasts for a future long-distance transportation system should include emerging and expected automobile, aircraft and HSR improvements. In this study, an environmental assessment of future long-distance travel is developed using the California corridor as a case study. We start by developing a per passenger-kilometer-traveled (PKT) attributional assessment of future transportation systems that expands the results of Chester and Horvath (2010) by evaluating (i) emerging automobiles and aircraft, (ii) new train designs, and (iii) lowcarbon electricity scenarios. We then develop a consequential assessment for the corridor to determine the net effects of the decision to build a new HSR system. Following our past work, we identify the critical system design parameters that lead to transportation systems having larger or smaller human and environmental footprints than their competitors. Our goal is to identify the potential design, construction and operation pitfalls early so that transportation planners and operators can reduce future impacts at potentially lower cost.

The goal of this research is to develop a framework for assessing the environmental effects of long-distance transportation in the California corridor to provide more comprehensive measures of the greenhouse gas, human health and other environmental damage potentials of future systems. We anticipate that this framework will (i) aid policy and decision makers in the assessment of long-distance transportation options, (ii) provide HSR designers, engineers and operators with information on how to best reduce environmental damage potentials, and (iii) provide a standard methodology by which other US and international transportation systems can be evaluated.

2. Methodology

An environmental assessment is developed for automobiles, aircraft and HSR operating in the California corridor between 2030 and 2050. When performing an LCA a year of analysis is generally defined. We choose to evaluate modes in a two-decade range to acknowledge the uncertainty in adoption of HSR and the challenges of estimating future life-cycle process improvements in a single year.

LCA is the preeminent framework for evaluating the energy and environmental effects of complex systems and can be used to understand the tradeoffs of transportation decisions. Life-cycle inventorying (LCI) is one stage of LCA, the quantification of environmental flows. Impact assessment must be performed to connect physical flows to the human health, ecosystem quality, climate change and resource effects of ultimate interest (ISO 2006, Jolliet et al 2003). End-use energy and air emissions are first inventoried. Air emissions include greenhouse gases (GHG) and conventional air pollutants (SOx, CO, NOx, VOCs, PM10 and PM2.5). GHGs are reported as CO2 equivalence (CO2eq) using radiative forcing multipliers of 25 for CH₄ and 298 for N2O for a 100 yr horizon. The US Clean Air Act established a regulatory framework for criteria air pollutants to reduce direct human and environmental impacts. SO2, CO, NOx, PM and ozone are regulated through National Ambient Air Quality Standards. We evaluate NO_x and VOCs because they are ozone precursors.

The LCI results are joined with human and environmental impact characterization factors from the Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI, v2.03) in the development of a life-cycle impact assessment (LCIA) (Bare et al 2002). Impact characterization factors are used to show the maximum potential effects of pollutant releases. In addition to global warming (CO2eq), human health respiratory, acidification, tropospheric ozone (smog) and eutrophication impact potentials are determined. We stress that impact potentials are the maximum effects that can occur and actual effects may be lower, or potentials may never turn into damages. However, given the challenge of combining air transport and chemistry modeling with concentration-response functions, endpoint damages have not been determined for this study. Bare et al (2002) provide background for TRACI and how air emissions are used to determine impact potentials.

2.1. Efficient and electric automobiles

Improved gasoline efficiency and plug-in hybrid electric vehicles (PHEV) are expected to have significant market penetration by 2030 (EPRI 2011). The 2007 US Energy Independence and Security Act established fleet-wide fuel economy standards at 35 mpg (15 km l⁻¹) by 2020. Furthermore, the US EPA and the National Highway Traffic Safety Administration have proposed a 102 g km⁻¹ CO₂ standard for 2025, which is equivalent to a fuel economy of 54.5 mpg (23 km l⁻¹) (EPA 2011). Given these policies and trends, it is reasonable to expect future long-distance

M Chester and A Horvath

automobile travel to occur in a vehicle that has improved fuel economy from the 21 mpg (9.6 km l⁻¹) average today (ORNL 2011). While a fuel economy standard does not translate to actual onroad performance, the range of economies modeled is intended to illustrate future potential performance of improved vehicles. Congestion effects are not modeled and it is acknowledged that this would increase the automobile footprint. Second-generation biofuels are likely to be a widespread transportation fuel in the future (Scown et al 2012), but we focus on reformulated-gasoline and electric vehicles.

Vehicle manufacturing, battery manufacturing (including replacement) and operation are evaluated with the GREET 1 (fuel-cycle) and 2.7 (vehicle-cycle) models (ANL 2011). A 35 mpg, 1500 kg sedan and a 55 mpg, 900 kg (before batteries) PHEV (ANL 2011) are modeled to meet future fuel economy standards. Large battery pack plug-in and battery electric vehicles are expected to have market penetration gains in the next decades, and we evaluate a PHEV60 (60 mi, 97 km all electric range) assuming that the first 97 km of a 480 km California long-distance trip are in charge-depleting mode and the vehicle is configured as a parallel hybrid drivetrain. GREET models vehicle emissions with a drive cycle that is 43% city and 57% highway. Using drive cycle characterizations from Karabasoglu and Michalek (2012), vehicle emissions are adjusted assuming that the beginning and ending 24 km of the trip occur in cities with the remainder occurring on highways. We believe that our PHEV60 assessment is conservative as future vehicles may have improved battery energy densities and intelligent operational controls that more effectively utilize a blended mode. The PHEV60 is modeled with one lithium-ion battery replacement and specifications are consistent with those modeled by Michalek et al (2011). All automobiles are evaluated with a 260 000 km lifetime. Brake wear, tire wear and evaporative losses are included. General maintenance and tire replacement are evaluated using EIO-LCA (GDI 2011). Lead-acid and lithium-ion battery replacement are evaluated with GREET. The energy and environmental effects associated with insurance industry operation (e.g., electricity consumption, waste management) are captured using EIO-LCA (GDI 2011).

The energy inputs and air emission outputs generated by the construction and maintenance of the California highway (interstate and major arterial) system serve as the infrastructure basis for future long-distance statewide travel. There are currently 12 100 km of California highways facilitating 250 billion annual vehicle-kilometers-traveled (VKT) (FHWA 2009). Across all California roadways there are 380 billion annual VKT and this is forecast to increase to 480 billion VKT by 2040 absent a HSR system (CAHSRA 2012). The 74% of asphalt surfaces are specified with a 15 yr life and concrete surfaces at 25 yr (both surface sub-bases are assumed to last 100 yr). Material production, transport, equipment process, and direct emissions from construction and maintenance activities are modeled with PaLATE (2004). Roadway construction effects are allocated to vehicles based on VKT splits and maintenance to heavy duty vehicles since

damage follows a fourth-power relationship to axle load (Huang 2004). Roadway design specifications, herbicide use and overhead lighting are included (Chester 2008).

Gasoline vehicle and PHEV60 energy production are evaluated with GREET and are specified with parameters commensurate with Michalek et al (2011). California reformulated gasoline is used, and GREET estimates that 18% of crude oil feedstock will be extracted from oil sands by 2020. For the PHEV60 and CAHSR, future regional electricity is used (this is detailed in later sections). Gasoline and electricity production include raw fuel feedstock inputs, transportation, processing (or generation) and distribution.

2.2. High-speed rail

HSR effects are determined following the approach of Chester and Horvath (2010) but updated to acknowledge that a future CAHSR system will likely see improved train performance and an opportunity for increased renewable electricity usage. The assessment by Chester and Horvath (2010) was designed to evaluate the high-speed rail system specified by CAHSRA (2005) under a life-cycle lens. CAHSRA (2005) performs an energy assessment based on large 1200 seat trains consuming an exaggerated 170 kWh of electricity per VKT. Despite acknowledging this over-estimate, Chester and Horvath (2010) chose not to redesign the CAHSRA (2005) system or challenge the publicized parameters. Given the uncertainty in the CAHSRA (2005) propulsion electricity estimate, primary data collection exercises were undertaken to develop improved electricity consumption estimates for a future CAHSR train. In this study, we evaluate three train sizes (400, 670 and 1200 seats) and use actual electricity consumption outcomes from Deutsche Bahn, instead of relying on literature. A range of HSR propulsion electricity exists in the literature and a survey and comparison are performed in the supplementary information (SI, available at stacks.iop.org/ERL/7/034012/mmedia). Actual electricity consumption factors for ICE trains (preliminarily chosen by CAHSRA 2005) were gathered from Deutsche Bahn (2011) and correspond to those reported by IFEU (2011) resulting in 13, 20 and 36 kWh/VKT for the respective train sizes. Regenerative braking effects are included. It is possible that the trains deployed in California will be several generations newer and will consume less electricity, but without data on future technologies we choose not to make projections, and instead assume current state-of-the-art technology for CAHSR.

A study has been performed for the CAHSR Authority to evaluate the feasibility of deploying wind and solar electricity to meet system-wide electricity demands (Navigant 2008) and strategies have been developed to power the stations and trains with 100% renewable energy (NREL 2011). While funding for a renewable electricity infrastructure remains uncertain, this future configuration is considered using existing PV and solar study LCIs (Pehnt 2006) with an 80% wind and 20% solar mix.

Vehicle (manufacturing, maintenance and insurance), infrastructure (construction, operation, maintenance and

M Chester and A Horvath

parking), and non-renewable electricity generation scenarios follow the methodology used in Chester and Horvath (2010, 2011) and are adjusted for future electricity inputs. The infrastructure assessment matches the results of Chang and Kendall (2011) when a commensurate system boundary is used. Whenever possible, we apply the Western Electricity Coordinating Council (WECC) electricity mix generation emission factors to scenario life-cycle components. Without a contract to purchase electricity from a particular supplier, electricity consumption by CAHSR should be evaluated in the WECC reliability network (Marriott and Matthews 2005), capturing flows across nearby states, including imports to California. Vehicle and infrastructure effects from WECC electricity use are based on a mix that has reached 2020 Renewable Portfolio Standards (WECC-RPS) (WECC 2011). Furthermore, a projected 2040 mix that has reduced coal inputs resulting in 60% carbon emissions intensity of today is also included (WECC-2040).

2.3. Next generation aircraft

Midsize aircraft (130-160 seats) were responsible for 79% of domestic US air travel PKT in 2009 (BTS 2011) and current and future planes are evaluated to capture significant improvements in engine fuel use and emissions. A Boeing 737-800 is used to evaluate currently operating state-of-theart aircraft. The 737-800 seats 160 and uses CFM56-7B26/2 engines. The Bombardier CS300-ER is an emerging aircraft that offers 20% fuel savings (and commensurate GHG savings) and additional emissions reductions over in-service planes. The CS300-ER will use Pratt and Whitney (PW) 1524G PurePower engines offering propulsive efficiency gains while carrying up to 130 passengers. For both aircraft, maintenance and insurance costs are based on 737-800 airframe materials, engine materials, insurance and hourly costs of employee benefits, reported by BTS (2011). To provide perspective on energy and environmental gains in air travel, the 737-800 and CS300-ER are compared against the legacy Boeing 737 series (<800) which has been a workhorse of the mid-haul market (Chester and Horvath 2010).

Fuel and emission indices are used to determine landing-takeoff (LTO) and cruise phase effects for a San Francisco to Los Angeles flight. In previous studies, LTO effects were determined with FAA (2010) and cruise phase with EEA (2006) data. These software and data do not offer the flexibility or transparency to evaluate future engine improvements. FAA (2010) reports fuel and emission indices which are combined with time-in-mode and rated thrust estimates to determine total flight effects for the 737s. The CFM56-7526/2 engines on the 737-800 achieve 25% reductions in CO, 27% in HC, 31% in NOx, and 97% in smoke emissions relative to CAEP6 engine emission standards (ICAO 2010). ICAO (2010) does not yet report PW1524G engine testing results, however, Hoke (2011) reports 64% reductions in CO, 96% in HC, 58% in NOx, and 50% in smoke emissions relative to CAEP6 standards, which were used to determine the CS300-ER flight emissions. Flight LTO and cruise fuel consumption and emissions were validated

by PW engineers (Pratt and Whitney 2011). Aircraft energy and environmental effects are determined with fuel and emission indices and rated thrust estimates by flight phase (see the SI for details, available at stacks.iop.org/ERL/7/034012/mmedia). The potential for respiratory, acidification and eutrophication impacts from non-LTO emissions are included (Barrett et al 2010, Tarrasón et al 2002).

3. Modal attributional footprinting

The assessment and allocation of direct and ancillary processes to each transportation mode reveal the life-cycle activities that should be targeted for the greatest environmental improvements. Consistent with existing transportation LCA studies, results are normalized to a per-PKT functional unit to evaluate the effectiveness of providing passenger mobility. For automobiles and CAHSR, a dearth of data exists to provide a rigorous assessment of expected occupancy rates. For aircraft, detailed reporting provides strong indicators for future utilization (BTS 2011). To avoid universally characterizing modal performance by normalizing to an average occupancy, reasonable and expected high and low occupancies are assessed to capture the potential of modes. For all modes, the high occupancy is the number of seats. Low occupancies are designed to consider off-peak ridership. While it is possible for CAHSR and aircraft to operate with a single passenger, this outlying case is not informative and therefore not shown. Low occupancy for CAHSR is approximately one-quarter of seats, and for aircraft is the lower occupancy quartile in 2009, determined from BTS (2011). Figure 1 shows global warming and human health respiratory life-cycle results for each mode for high and low occupancy.

GHG emissions are dominated by vehicle propulsion (energy production for CAHSR and vehicle operation for automobiles and aircraft) but show increases of 38-54% for automobiles, 77-116% for future CAHSR and 13-34% for aircraft when all life-cycle components are included. Results for future long-distance modes are consistent with those identified in past transportation LCA studies (Chester and Horvath 2010, 2009) even when new data and modeling are included (ANL 2011). Automobile vehicle manufacturing is dominated by steel and plastic use (ANL 2011), and maintenance effects are largely the result of supply chain electricity (GDI 2011). CAHSR infrastructure construction effects are dominated by concrete use. Approximately 67% of CAHSR infrastructure emissions are the result of cement production for concrete use and 9% are related to steel production. Automobile infrastructure effects are small compared to past studies because only highways are included to isolate long-distance infrastructure. The inclusion of trip-specific infrastructure provides a clearer comparison of corridor travel by focusing only on roads, tracks and airports needed for each trip. Non-propulsion fuel-cycle effects are primarily the result of refineries, oil and gas extraction activities, and supply chain electricity use (ANL 2011, GDI 2011). With distributed hard infrastructure and its long-distance nature, the life-cycle effects of air

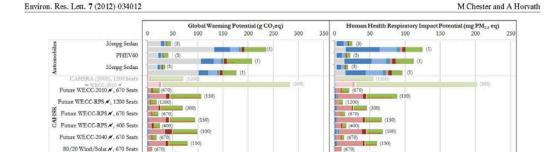


Figure 1. Global warming and human health respiratory impact potential results per PKT. For each mode, results at long-run average high and low occupancy (shown in parenthesis) are displayed as juxtaposing bars. Previous research by the authors reported electricity generation effects for electric vehicle propulsion in the Vehicle Operation life-cycle groupings. In an effort to improve the spatial characterization of effects, electricity generation for CAHSR propulsion is reported in Energy Production and differentiated from upstream effects (e.g., emissions from fuel extraction and transport) by a red line. The CAHSRA (2005) train is shaded gray to emphasize that it is an unlikely outcome, but reported for comparative purposes.

Infrastructure Insurance

■ Infrastructure Parking

travel are diminished when results are normalized per PKT. WECC-2040 electricity reduces HSR GHG propulsion emissions by 26% but infrastructure construction effects continue to add heavy burdens to life-cycle results showing the need for low-CO₂ materials.

(130) (82)

icle Inactive Operation

Boeing 737 Legacy Boeing 737-800

Bombardier CS300-ER

■ Infrastructure Operation

Across modes and life-cycle groupings, PM₁₀ emissions are often generated by mining activities for raw materials, and PM2.5 emissions by supply chain combustion processes including electricity generation, the latter contributing to human health respiratory impact potentials. While PHEV60s produce fewer PM25 emissions during propulsion, battery manufacturing and associated electricity requirements have the potential to contribute significant PM25 and SO_x emissions and increase respiratory impacts beyond the 35 mpg sedan. This implies that strategies should be developed that minimize human and environmental exposure as the battery industry expands, and that meeting or exceeding RPS standards will reduce impacts across automobiles and CAHSR. For CAHSR, concrete and steel production including upstream mining activities are larger than propulsion effects. The dominating share of environmental impact potentials are often in non-propulsion components and are shown in figure 2.

Several common processes dominate the environmental impact potentials. Vehicle manufacturing and maintenance are affected by assembly activities, but are dominated by the use of metals (i.e., steel, aluminum and copper) and its associated electricity demands for processing. Supply chain truck transport for these processes also contributes heavily to CO, NO_x and VOC emissions. Asphalt and concrete use dominate infrastructure construction and the use of these materials is affected primarily by direct emissions at hot-mix asphalt and cement kilns, and their associated electricity demands. Airport ground support equipment use contributes heavily to aircraft life-cycle results. For automobiles and

aircraft, fuel production effects are largely the result of refinery electricity demands and extraction activities, and for HSR are dominated by primary fuel extraction, processing and transport. Air pollutant emission reductions may achieve the largest benefit-to-cost ratio by targeting infrastructure and supply chain effects.

Energy Production

Assuming that options exist, the decision by a traveler to take a mode produces marginal effects in the shortrun, a subset of those reported in figures 1 and 2. For example, the decision to walk instead of driving immediately avoids fuel consumption and emissions from vehicle operation. Including mid-run life-cycle components avoids vehicle manufacturing, vehicle maintenance, vehicle insurance, infrastructure maintenance, and associated supply chain effects including fuel refining. Ultimately, a critical mass of travelers choosing to walk instead of drive would have long-run effects including reductions in roadway capacity needs avoiding future infrastructure construction. Marginal effects are critical for understanding the change in energy or environmental outcomes from a policy or decision. Long-run average effects are reported to provide a comprehensive set of indicators for analysts, however, future analyses with these results should consider marginal effects at specified timescales. Long-, mid- and short-run average and marginal comparisons are presented in the SI (available at stacks.iop. org/ERL/7/034012/mmedia).

Considering the potential of a mode to environmentally outperform another is critical to developing strategies that acknowledge different long-term operating characteristics. Modal potential considers the occupancy range in which transportation systems operate instead of averages which can mask peak and off-peak, position along lines and day-of-week characteristics, to name a few. Future CAHSR ridership forecasts have been developed and scrutinized (Brownstone et al 2010). Designs that do not access airports

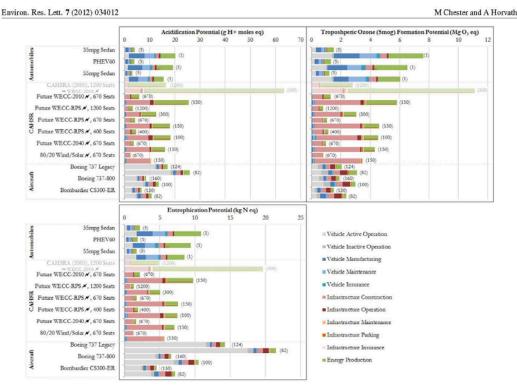


Figure 2. Environmental impact potentials per PKT.

and city centers, hub existing transit at HSR stations and encourage urban infill are inimical to high ridership, and risk disincentivizing trip takers switching from autos. Technical, political, community and economic roadblocks exist for many high ridership configuration options that could ultimately lead to lower than optimal adoption outcomes. Furthermore, even with high ridership configurations, the system will at times (whether during off-peak or end-of-lines) exhibit fluctuations and these instances should be considered in policies that target marginal operation. Given the large uncertainty in a future HSR system's ridership, figure 3 shows the CAHSR life-cycle and vehicle propulsion effects at varying occupancy levels against a current mean occupancy automobile and midsize aircraft (represented as a 2.2 passenger 35 mpg sedan and 116 passenger 737–800).

The sensitivity to vehicle occupancy is used to illustrate breakeven points, or the ridership levels where one mode is equivalent to another in the long-run. Occupancy levels of between 80 and 280 passengers produce HSR GHG-equivalency to future automobiles or aircraft (depending on train size). However, for acidification potential, this equivalency increases to between 160 and 420 passengers, or roughly 35–40% average occupancy for trains. This assumes that the WECC has met the RPS. The acidification breakeven points capture the dynamic of mode switching from low-sulfur liquid fuels to high-sulfur electricity and

reaffirm the findings of Chester and Horvath (2010) that deployment of HSR should occur with mandates for cleaner propulsion electricity sources to avoid increased human and environmental impact potentials. The breakeven point assessment highlights the importance of future ridership scenario considerations in the determination of potential corridor effects.

4. Regional consequential effects

To evaluate the net effects of the decision to implement a new system in the corridor, a consequential assessment is developed. A consequential assessment should compare a without HSR future where additional automobile and aircraft capacities are needed to meet growing demands to a with HSR future where the new rail system reduces the need to fully build this capacity. Estimates of this capacity expansion have been produced by the Authority (PB 2011) and the LCA methods can be used to evaluate the change in effects in the corridor. The per-PKT results reported in figures 1 and 2 are valuable for understanding the footprint of each transportation system in the long-run but do not allow for direct assessment of the changes in corridor impacts when a new system is implemented. For example, an infrastructure will be constructed to facilitate an

M Chester and A Horvath

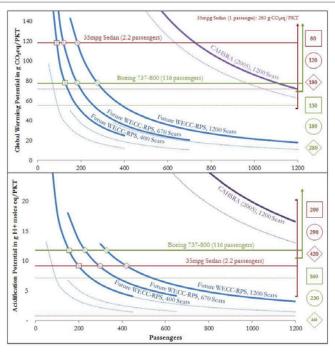


Figure 3. CAHSR global warming and acidification potential sensitivity to vehicle occupancy. Life-cycle results are shown as solid colored lines and vehicle propulsion as dotted. Breakeven points are shown as red and green shapes on the figure and corresponding ridership levels are shown on the right side. While average occupancies are shown for the 35 mpg sedan and 737–800, their potential ranges are shown as vertical lines on the right side.

expected level of service for CAHSR. This infrastructure may be flexible to accommodate more passengers if demand is greater than anticipated. Yet if the per-PKT GHG results in figure 1 are applied to the different PKT demand forecasts, different net infrastructure construction effects would be falsely determined (i.e., the infrastructure construction effects remain the same with different ridership outcomes). While the attributional assessment can inform questions like: what are the major energy and environmental processes in the life-cycle of a transportation system, and how can they most effectively be reduced? A consequential assessment is needed to answer questions such as: how can California deploy a future multi-modal transportation system with the lowest human and environment impacts?

The energy and environmental costs of a new HSR system should be compared against the avoided costs of automobile and air infrastructure expansion, assuming there is long-distance travel demand growth. PB (2011) estimated that 3600 freeway lane km and 13 000 m of runways, and 115 additional airport gates are needed to meet growing corridor demand in the coming decades. This is the only assessment of future infrastructure expansion needs to date and it is possible that this is an aggressive estimate. PB (2011) estimates are based on full corridor future capacity (117 million auto and air trips) and the most recent forecasts estimate 33 million HSR trips at high ridership. Therefore, 28% of infrastructure

expansion effects are considered (i.e., 1000 lane km, 3600 m of runways and 32 additional airport gates) to account for only the avoided effects of HSR travelers and may be an aggressive allocation because of induced demand. Using roadway design guidelines (AASHTO 2001), construction and maintenance energy and emissions were calculated with PaLATE (2004) following Chester and Horvath (2009). The runway expansion would come with an estimated 670 000 m2 of taxiways and tarmacs. Construction and maintenance of concrete runways and asphalt taxiways and tarmacs are also evaluated with PaLATE (2004) using dimensions reported by Chester (2008). For all surfaces, it is assumed that the wearing courses will last 20 yr and subbases 50 yr. It is also assumed that infrastructure expansion will start 10 yr after it has been decided not to build HSR, and will occur over 30 yr. Airport gate and corresponding concourse expansion construction follow the methodology of Chester (2008). Detailed construction and maintenance schedules for the infrastructure expansion are provided in the SI (available at stacks.iop.org/ERL/7/034012/

Consequential effects are highly sensitive to modal shifts and forecasting of HSR energy and environmental effects should occur with uncertainty assessment. Forecasts for CAHSR adoption have only been reported by the Authority making rigorous uncertainty assessment challenging. Adoption discussions by the Authority have been presented through

M Chester and A Horvath

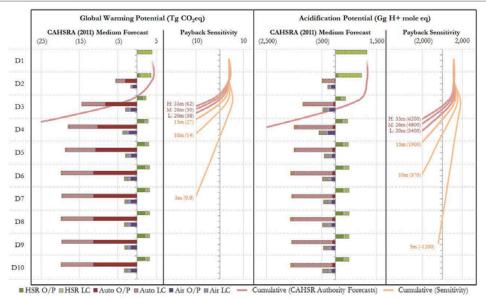


Figure 4. Decadal (D) consequential global warming and acidification potentials including payback for phase 1. O/P = operation and propulsion components (impacts from energy consumed to move vehicles). LC = life-cycle (excludes operation and propulsion components). Life-cycle effects are separated by infrastructure expansion (yellow background) and non-infrastructure (e.g., vehicle manufacturing and maintenance). After each ridership forecast (shown in millions (m) of annual trips in 2040), the 50 yr savings are shown in parentheses. These savings are the GHG or acidification benefit (negatives are costs) after 50 yr from groundbreaking.

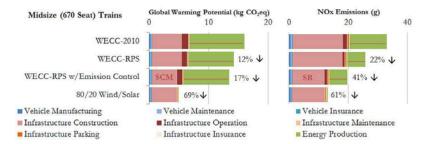


Figure 5. Energy and emission control strategies for reducing environmental impacts per VKT.

without HSR and with HSR forecasts. The consequential assessment considers the difference between these two, essentially, what environmental changes have occurred in California as a result of implementing HSR. The current forecasts report that by 2040 CAHSR Phase 1 (San Francisco to Los Angeles) will perform between 27 and 41 million annual VKT (PB 2012a). The Authority's medium with HSR forecast (34 million HSR VKT) displaces 5.8 billion auto VKT and 5.1 million air trips annually, generating between 20 and 33 million trips on the new mode (PB 2012a, 2012b). Using these forecasts, the Authority's medium (middle) projection is first evaluated to determine the consequential effects at full adoption in 2040. The WECC-RPS 670 seat HSR train is compared against displaced travel in a 35 mpg sedan and

737–800 aircraft (assumed to be reasonable representative vehicles for 2040). In the *without HSR* scenario, it is estimated that auto travel will increase from 380 billion VKT today to 480 billion VKT, and air travel will increase to 33 million trips (PB 2012b).

The deployment of CAHSR will create induced demand as a subset of trip takers who would not travel by auto or air now find the generalized cost for the journey lower than existing options (Outwater et al 2010). Additionally, access to and from HSR stations by autos and other modes may induce new system-wide demand. The CAHSRA (2012) with HSR forecast includes estimates of new trips and these are bundled in the aforementioned VKT. We model induced demand implicitly through the change in travel reported by CAHSRA (2012). A summary of the with HSR and without

M Chester and A Horvath

HSR consequential analysis critical parameters is provided in the SI (available at stacks.iop.org/ERL/7/034012/mmedia).

The consequential assessment evaluates the difference between a future where CAHSR has or has not been constructed. Figure 4 shows the GHG and acidification potential for operation/propulsion and other life-cycle (including the avoided expansion of auto and air infrastructure) effects aggregated per decade for Phase 1 of the system (San Francisco to Los Angeles). The cumulative effect curve shows the time until payback. Given the uncertainty in the forecasts (Brownstone et al 2010), a payback sensitivity analysis is performed on the high adoption scenario as reported by the Authority (41 million VKT). The sensitivity analysis evaluates how long it takes CAHSR to achieve payback given certain adoption levels (for perspective, the Authority's low adoption scenario is 66% of ridership in the high adoption scenario) and considers the high (H), medium (M) and low (L) scenarios followed by decreases of 5 million (m) annual

The payback sensitivity reveals several important considerations for transportation planners and air quality policy makers. The cumulative plum-colored lines for the high, medium and low forecast figures show that the GHG payback will likely occur between 20 and 30 yr (D3) after groundbreaking and acidification potential after 20-40 yr. However, payback is highly sensitive to reduced automobile travel. The 5.8 billion auto VKT displaced dominate emissions changes in the corridor and the effects from reduced air travel and CAHSR are small. The reduced auto impacts are significantly affected or dominated by life-cycle components, in particular, avoided vehicle manufacturing, vehicle maintenance and gasoline production. For GHGs the sooner the system is implemented the more opportunity it will have to help meet GHG reduction policies aiming for 80% of 1990 statewide emissions by 2050. Larger trains or more carbon-intensive electricity generation will delay the payback further. Acidification, the release of SOx and NOx emissions which are of concern for respiratory and cardiovascular (through secondary particle formation) effects, agricultural impacts and increased built environment maintenance costs, are dominated by life-cycle processes. For infrastructure life-cycle processes acidification is dominated by the combustion of sulfur-bearing compounds in clinker manufacturing for cement used in concrete freeways, and for non-infrastructure life-cycle processes supply chain electricity use. Ultimately, impacts should account for the time-based radiative forcing of GHGs, high-altitude CO2 emissions effects, and the shifting of human and environmental effects from vehicle tailpipes to powerplants, to name a few additional factors. We reserve these analyses for future studies. The results of the consequential assessment are highly sensitive to automobile trips avoided and efforts should be made to validate the travel demand model used by the Authority.

5. Strategies for reducing environmental impacts

Given the dominating HSR life-cycle effects from electricity generation and infrastructure construction, strategies can

be identified to reduce the system's footprint, prior to its construction and use. First, by meeting the RPS, GHG and NO_x emissions will be reduced by 12% and 22%. Next, emission control strategies are identified for reducing the infrastructure footprint. For GHGs, the use of supplementary cementitious materials (SCMs) such as fly ash or ground granulated blast furnace slag can reduce concrete's footprint by 14-22% depending on the mixture (Flower and Sanjayan 2007). It is expected that the portion of the infrastructure that impacts roadways will be required to use fly ash to meet California Department of Transportation requirements. Furthermore, if the Authority requires concrete producers to utilize cement kilns with selective catalytic and non-catalytic reduction (SR) advanced NOx controls, material production emissions can be decreased between 35 and 95%, reducing the potential for acidification, respiratory, smog and eutrophication potential impacts (EPA 2007). Lastly, the use of 100% renewables lowers electricity generation impacts (to only power generation facility construction effects) and combined with the infrastructure control strategies produces the greatest reductions. The effects of these strategies are shown in figure 5.

The impact reduction strategies can decrease GHGs between 12 and 69% and NO_x emissions between 22 and 61%. The costs of implementing these strategies should be compared against other opportunities, particularly those identified by GHG and air quality policies. The 80/20 Wind/Solar train, outside of the infrastructure material footprint, has a payback within the first few years of operation and is equivalent to the GHG assessment developed by the Authority, based on NREL (2011), following California Environmental Quality Act requirements.

The transportation emissions reduction from CAHSR, if operating within a cap-and-trade system, should be evaluated. Cap-and-trade programs have been successfully implemented in the US for NOx and SOx, and California continues to discuss a GHG initiative. Cap-and-trade programs remove the potential of any single initiative to reduce aggregate emissions as offsets will be met by increases elsewhere in the economy (Millard-Ball 2009). This is because the cap is designed to equalize the marginal abatement cost and does not encourage each economic sector to undertake reductions. Furthermore, if road and rail emissions are part of the cap but aircraft emissions are not, then the only major GHG change resulting from HSR implementation will be the displaced airplane operational emissions. To meet GHG reduction goals, policy makers should consider where CAHSR potential reductions will be counted, whether that is in a cap-and-trade program or direct transportation mandates.

6. Planning for a sustainable mobility future

HSR has the *potential* to reduce passenger transportation impacts to people and the environment, but must be deployed with process and material environmental reduction measures and in a configuration that will ensure high adoption. We have highlighted the life-cycle hotspots that dominate modal success: (i) train size (affecting electricity consumption,

Environ. Res. Lett. 7 (2012) 034012

M Chester and A Horvath

frequency of service and ridership); (ii) infrastructure construction; and (iii) the fossil fuel intensity of the electricity mix. By identifying low and high adoption outcomes, the potential benefits can be discussed, instead of speculating on a normative long-distance transportation future, especially in light of large uncertainty that surrounds many critical factors of the system. Ultimately, this research aims to inform planners and decision makers about providing sustainable mobility options. Planners and policy makers should be asking how a future sustainable transportation infrastructure can be deployed to meet increasing travel demands with the lowest total cost, including externalities. The environmental benefits of HSR should be joined with other considerations when making decisions about the system. Ultimately, decision assessment should include changes in travel time, productivity, congestion, safety, transportation infrastructure resilience, freight synergies, urban development opportunities and employment, in addition to GHG, human health and environmental damages.

Acknowledgments

The authors would like to thank several organizations and individuals for their intellectual support of this research. Elizabeth Mitchell and Domingo Sepulveda of Pratt and Whitney, and Professor Alan Epstein of MIT and Pratt and Whitney were instrumental in helping us determine future aircraft fuel consumption and emissions. Constantin Vogt of Deutsche Bahn provided valuable information and data on the operations of an established HSR system. Jeremy Michalek, Orkun Karabasoglu (Carnegie Mellon University) and Constantine Samaras (RAND) provided invaluable guidance for the PHEV assessment. Finally, the authors would like to express profound gratitude to Lee Schipper, who passed away during the development of this study, and provided continuous support and encouragement.

References

- AASHTO (American Association of State Highway and Transportation Officials) 2001 A Policy on Geometric Design of Highways and Streets (Washington, DC: AASHTO)
- ANL (Argonne National Laboratory) 2011 Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Models, GREET 1 2011 Evaluates Fuel Cycles and GREET 2.7 Evaluates Vehicle Cycles (Argonne, IL: ANL)
- Bare J, Norris G, Pennington D and McKone T 2002 TRACI: the tool for the reduction and assessment of chemical and other environmental impacts J. Indust. Ecol. 6 49–78
- Barrett S, Britter R and Waitz I 2010 Global mortality attributable to aircraft cruise emissions Environ. Sci. Technol. 44 7736–42
- Brownstone D, Hansen M and Madanat S 2010 Review of Bay Area/California high-speed rail ridership and revenue forecasting study Berkeley Institute of Transportation Studies Research Report #UCB-ITS-RR-2010-1 (Berkeley, CA: University of California) (available online at www.its.berkeley.edu/publications/UCB/2010/RR/UCB-ITS-RR-2010-1.pdf)
- BTS (Bureau of Transportation Statistics) 2011 Air Carrier Statistics (Form 41 Traffic) Tables T100 and P52 (Washington, DC: US Department of Transportation) (available online at www.transtats.bts.gov/)

- CAHSRA (California High-Speed Rail Authority) 2005 Final Program Environmental Impact Report/Environmental Impact Statement for the Proposed California High-Speed Train System (Sacramento, CA: CAHSRA)
- CAHSRA (California High-Speed Rail Authority) 2012 California High-Speed Rail Program Draft Revised Business Plan (Sacramento, CA: CAHSRA)
- Chang B and Kendall A 2011 Life cycle greenhouse gas assessment of infrastructure construction for California's high-speed rail system Transp. Res. D 16 429–34
- Chester M V 2008 Life-cycle environmental inventory of passenger transportation modes in the United States *PhD thesis* Department of Civil and Environmental Engineering, University of California, Berkeley (available online at http://escholarship.org/uc/item/7n29n303)
- Chester M V and Horvath A 2009 Environmental assessment of passenger transportation should include infrastructure and supply chains Environ. Res. Lett. 4 024008
- Chester M V and Horvath A 2010 Life-cycle assessment of high-speed rail: the case of California Environ. Res. Lett. 5 01 4003
- Chester M V and Horvath A 2011 Vehicle manufacturing futures in transportation life-cycle assessment Berkeley Institute of Transportation Studies Research Report #UCB-ITS-RR-2011-3 (Berkeley, CA: University of California) (available online at http://escholarship.org/uc/item/1qp3f0vc)
- Deutsche Bahn 2011 Personal communications with Constantin Vogt (DB Environment Center) between June 2010 and October 2011
- EEA (European Environment Agency) 2006 EMEP/CORINAIR Emission Inventory Guidebook (Copenhagen: EEA) (available at http://reports.eea.europa.eu/EMEPCORINAIR4)
- EPA (Environmental Protection Agency) 2007 Alternative Control Techniques Document Update—NO_x Emissions from New Cement Kilns (Washington, DC: EPA)
- EPA (Environmental Protection Agency) 2011 EPA and NHTSA Propose to Extend the National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks (Washington, DC: EPA)
- EPRI (Electric Power Research Institute) 2011 Transportation Electrification: A Technology Overview (Palo Alto, CA: EPRI)
- FAA (Federal Aviation Administration) 2010 EDMS 5.1.3: Emission and Dispersion Modeling System Software (Washington, DC: FAA)
- FHWA (Federal Highway Administration) 2009 Highway Statistics Publications (Washingtion, DC: US Department of Transportaion) (available online at www.fhwa.dot.gov/policy/ohpi/fhss/hsspubs.cfm)
- Flower D and Sanjayan J 2007 Green house gas emissions due to concrete manufacture Concr. Manuf. 12 282–8
- Green Design Institute 2011 Economic Input—Output Analysis-Based Life-Cycle Assessment Software (Pittsburgh, PA: Carnegie Mellon University) (available online at http:// www.eiolca.net/)
- Hoke J 2011 Recent combustor technology development progress Presentation to the Society of Automotive Engineers 2011 AeroTech Workshop (Toulouse)
- Huang Y 2004 Pavement Analysis and Design 2nd edn (Upper Saddle River, NJ: Prentice-Hall)
- ICAO (International Civil Aviation Organization) 2010 Engine Emissions Databank (West Sussex: Civil Aviation Authority) (available online at www.caa.co.uk/)
- IFEU (Institut für Energie und Umweltforschung) 2011

 UmweltMobil/Check: Wissenschaftlicher Grundlagenbericht
 (Heidelbere: IFEU)
- ISO (International Organization for Standardization) 2006 14040 Environmental Management Life Cycle Assessment (Geneva: ISO)

Environ. Res. Lett. 7 (2012) 034012

M Chester and A Horvath

- Jolliet O, Margni M, Charles R, Humbert S, Payet J, Rebitzer G and Rosenbaum R 2003 IMPACT 2002+: a new life cycle impact
- assessment methodology Int. J. Life Cycle Assess. 8 324–30 Karabasoglu O and Michalek J 2012 Influence of driving patterns on life cycle benefits of hybrid and plug-in electric vehicles (in preparation)
- Marriott J and Matthews H S 2005 Environmental effects of interstate power trading on electricity consumption mixes Environ. Sci. Technol. 39 8584-90
- Michalek J, Chester M, Jaramillo P, Samaras C, Shiau C and Lave L 2011 Valuation of plug-in vehicle life-cycle air emissions and oil displacement benefits *Proc. Natl Acad. Sci.* 108 16554-8
- Millard-Ball A 2009 Cap-and-trade: five implications for transportation planners Transp. Res. 2119 20-6
- National Renewable Energy Laboratory 2011 California High Speed
- Rail Authority Strategic Energy Plan (Golden, CO: NREL) Navigant Consulting 2008 The Use of Renewable Energy Sources to Provide Power to California's High Speed Rail (Rancho Cordova, CA: Navigant)
- ORNL (Oak Ridge National Laboratory) 2011 Transportation Energy Data Book 30th edn (Oak Ridge, TN: ORNL)
- Outwater M, Tierney K, Bradley M, Sall E, Kuppam A and Modugula V 2010 California statewide model for high-speed rail J. Choice Modell. 3 58–83
- PaLATE (Pavement Life-Cycle Assessment Tool for Environmental and Economic Effects) 2004 (Berkeley, CA: University of California) (available online at www.ce.berkeley.edu/horvath/palate.html)

- PB (Parsons Brinckerhoff) 2011 Costs of Providing the Equivalent Capacity to High-Speed Rail through Other Modes, Draft (Sacramento, CA: PB)
- PB (Parsons Brinckerhoff) 2012a California High-Speed Rail Project: Estimating High-Speed Train Operating & Maintenance Costs for the CHSRA 2012 Business Plan (Sacramento, CA: PB)
- PB (Parsons Brinckerhoff) 2012b California High-Speed Rail Project: California High-Speed Rail Benefit-Cost Analysis (BCA) (Sacramento, CA: PB)
- Pehnt M 2006 Dynamic life cycle assessment of renewable energy technologies Renew. Energy 31 55-71
- Pratt and Whitney 2011 Personal communications with Elizabeth Mitchell (Manager, Technology & Environment Special Initiatives) and Domingo Sepulveda (Manager, Environmental Regulatory Affairs-Emissions) between September 2010 and November 2011
- Scown C, Nazaroff W, Mishra U, Strogen B, Lobscheid A, Masanet E, Santero N, Horvath A and McKone T 2012 Lifecycle greenhouse gas implications of US National scenarios for cellulosic ethanol production Environ. Res. Lett. 7 014011
- Tarrasón L, Jonson J, Berntsen T and Rypdal K 2002 Study on Air Quality Impacts of Non-LTO Emissions from Aviation (Oslo: Norwegian Meteorological Institute)
- WECC (Western Electricity Coordination Council) 2011 10-Year Regional Transmission Plan (Salt Lake City, UT: WECC)

Letter 4

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

March 22, 2017 Uploaded to: sb375targetupdate-ws

Mary Nichols, Chair California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: Regional GHG Emissions Reduction Targets Updates

Dear Ms. Nichols:

The Transportation Solutions Defense and Education Fund (TRANSDEF) is an environmental non-profit dedicated to the regional planning of transportation, land use and air quality. Our specific focus is on reducing the climate impacts of transportation. Our previous comments on the Scoping Plan and Regional GHG Emissions Reduction Targets ("Regional Targets") are posted on our website and are incorporated herein by reference: http://transdef.org/Climate_Change/Climate_Change.html

Compliance with SB 375

TRANSDEF contends that ARB has not complied with the requirements of SB 375 in its prior approval of Regional Targets and its decision to not update them. By essentially accepting the recommendations of MPOs for their respective targets, ARB allowed each of the regions to have per capita targets that were lower than the expected rate of population growth. By simple arithmetic, as the population grows, that must inevitably result in higher regional GHG emissions than current levels, even if MPOs achieve their targets. That outcome is completely opposite to the Legislature's intent in adopting SB 375. The legislative findings for SB 375 identify that:

...greenhouse gas emissions from automobiles and light trucks can be substantially reduced by new vehicle technology and by the increased use of low carbon fuel. However, even taking these measures into account, it will be necessary to achieve **significant additional** greenhouse gas reductions from changed land use patterns and improved transportation. Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32. (Chapter 728, Statutes of 2008, Section 1(c) and (i), emphasis added.)

TRANSDEF 3/22/17 p. 2

TRANSDEF asserts that the following elements will be necessary to approve a legally defensible Regional Targets update:

- BAU emissions estimate for the light-duty vehicle sector covered by SB 375
- Scoping Plan emissions reduction targets for each emissions sector, including for this sector, that in total achieve the state's targets
- Emissions projections for this sector for each region, based on the proposed targets
- Certification by staff that, if the proposed targets were achieved by each region, the overall emissions for this sector would be significantly reduced.

These elements constitute an inherently top-down process. The 2016 Mobile Source Strategy states that "ARB and the MPOs will be working on a comprehensive bottom-up process to update SB 375 targets." (p. 51.) We assert that ARB has misinterpreted the law as a call for a bottom's-up process. All the law prescribes is that "Prior to setting the targets for a region, the state board shall exchange technical information with the metropolitan planning organization and the affected air district. The metropolitan planning organization may recommend a target for the region." G.C. 65080(b)(2)(A)(ii).

ARB needs to reconsider its 2010 decision to use a bottoms-up approach, as it is not working. No transportation agency we are aware of has yet acknowledged that climate change is <u>its</u> problem. They all act as if some other agency--most likely ARB--is going to take care of the problem, and leave them out of it. They continue to facilitate solo driving and see no need to change, as they are truly oblivious of the consequences in GHGs.

The 2014 SB 375 Implementation review avoided the question of the cumulative statewide emissions reductions resulting from the regional targets. Buried in an obscure ARB publication was the calculation that the SB 375 program will produce reductions of 3 MMTCO $_2$ e, where the 2008 Scoping Plan had a placeholder target of 5 MMTCO $_2$ e. This gap has never been dealt with.

The Proposed Final 2017 Scoping Plan Update states:

Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals. (p. 101.)

TRANSDEF asserts that the gap referred to in this quote is the gap between the Regional Targets that are proposed by MPOs and those that are derived from a top-down process intended to achieve statewide targets. We further assert that if there is a gap remaining after the adoption of updated Regional Targets, ARB will have shirked its duty to best implement the intent of AB 32 and SB 375.

TRANSDEF 3/22/17 p. 3

Pricing

We note that the adopted Regional Targets acquiesced to the notion that because land use effects are long-term, it is logical that the 2020 targets be lower than the 2035 targets. This approach completely ignores the realm of pricing measures, which can be implemented very quickly. We associate the absence of a discussion of the feasibility of pricing with the contentious national attitude towards a pressing emergency.

Scientists inform us that there are only a few years left to correct our emissions overhang before irreversible and catastrophic changes take place. We call on ARB to use the best science to recognize the urgent need for early reductions. This will require strong leadership to educate the public about the need for increased pricing of driving. We fully recognize this will take political courage and offer to assist in any way we can.

Timing

We reject the idea that lower, more achievable, targets are a wise idea. We don't have 10 or 20 years to build confidence. Unfortunately, climate is not a problem that can be responded to at a pace that is comfortable for government. We previously commented that The *Preliminary Draft Staff Report on the SB 375 Greenhouse Gas Reduction Target Update Process* (2014) lacked any sense of urgency. It seems to us that the first step in updating Regional Targets is for the Board to decide "Are we facing a climate crisis?" The degree of crisis perceived will determine the outcome of the process.

Margin of Safety

As climate science advances, it becomes ever more clear that larger reductions are needed, and needed sooner than previously thought, as the models had been overly conservative. We recommend that target setting include the provision of a margin of safety, as is commonplace in the setting of health-based criteria pollutant standards.

Conclusion

Right now, science is telling us what needs to be done and government is not doing it. The target-setting process is not just a technical exercise. ARB's work needs to become a national and global model for the responsible planning of development. If human civilization is to survive climate change, it is crucial that targets be adopted that lead to sufficient change. Failure to do so is not an option.

The challenge for Board members now is the question "Are we facing a climate crisis?" When each member is able to answer it in a way that they can feel comfortable defending to future generations, ARB will be ready to make wise policy decisions.

It will take a top-down process tied to the Scoping Plan's goals to provide sufficient justification for making uncomfortable policy decisions at the State, regional and local levels. Local elected officials expecially need this kind of evidentiary backup--they will be on the front lines, making scary decisions for a public that does not like change. Please give them the leadership and the guidance they need to play their part in the upcoming difficult transition to a low-carbon way of life.

Appendix A - Comment Letters

TRANSDEF 3/22/17 p. 4

We would be pleased to answer any questions you might have, at the phone number above.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn, President David@Schonbrunn.org



Letter 101

April 10, 2017

Mary Nichols Chair, Air Resources Board 1001 "I" Street Sacramento, CA

RE: The 2017 Climate Change Scoping Plan Update

Dear Chair Nichols and Staff:

The Alliance of Regional Collaboratives for Climate Adaptation (ARCCA) welcomes the opportunity to provide comments on the Proposed 2017 Climate Change Scoping Plan Update (Proposed Plan).

ARCCA is a network of existing regional collaboratives from across California. Our members are coordinating and supporting climate adaptation efforts in their own regions to enhance public health, protect natural systems, build economies, and improve quality of life. Through ARCCA, member regional collaboratives come together to amplify and solidify their individual efforts, as well as to give a stronger voice to regionalism at the state and federal levels. ARCCA members share information on best practices and lessons learned; identify each region's most innovative and successful strategies; and determine how these strategies could be adapted to another region's particular needs. As a result, ARCCA bolsters the efforts of member collaboratives and empowers those interested in forging new regional partnerships.

We offer a few comments and recommendations for consideration to improve the Proposed Plan to better achieve State goals and to take a comprehensive approach to responding to climate change.

- We appreciate ARB's intent to provide a comprehensive policy framework to integrate the
 multitude of related state laws and programs to provide streamlined guidance. We offer a few
 comments to support ARB's effort and to make this approach more effective.
 - a. While the Proposed Plan captures a few important state orders and laws, such as EO B-30-15, SB 32, SB 350, SB 1383 and several others, recent laws have not been adequately discussed nor integrated. We recommend the inclusion and integration of AB 1482, SB 246, SB 379, SB 1000, AB 2139, and AB 2800 to strengthen the critical link between climate change mitigation and adaptation. We have developed legislative update factsheets for 2015 and 2016 that highlight these important laws.
 - b. We recommend incorporating findings and recommendations from State guidance documents, plans, and tools that have already been developed to leverage the best available science and research to appropriately respond to climate change impacts. Key documents and tools that are not discussed in the Proposed Plan include <u>Safeguarding California</u>: <u>Implementation Action Plans</u>, <u>2013 CDPH Extreme Heat Adaptation Plan</u>, <u>Cal-Adapt Extreme Heat Projections</u>, and many other relevant State reports. While guidance















from the EO B-30-16 Technical Advisory Group is not yet finalized, we recommend connecting with the group to proactively incorporate relevant guidance in the Plan.

- c. We recommend coordinating with key state agencies to retool the process and timeline before the next Scoping Plan update. The 2017 update was developed out of sync with component plans, including the Forest Carbon Plan and the Short-Lived Climate Pollutants Strategy, which would have provided critical data and recommendations to ensure informed target-setting and greater understanding of where investments are needed.
- d. While we agree that it is critical to integrate policies and programs at the state level, much of the burden to meet state targets falls on local and regional agencies. As reductions become more difficult to achieve over time, strategies that establish regional targets linked to local goals that already have substantial community buy-in can be more effective. Economic growth and job creation receive strong support from Californians throughout the state urban and rural, red and blue, coastal and inland. To support local and regional agencies, we recommend ARB conduct deeper economic analyses to identify and promote actions that demonstrate a strong connection between emissions reduction, resiliency to the impacts of climate change and economic growth, particularly for job growth and from a regional perspective.
- e. Finally, to better ensure complimentary local emission reduction programs do not run into additionality concerns, we recommend the development of a clear methodology on how to determine when state programs end and local programs begin.
- We recommend greater consideration of adaptation and natural resources to achieve 2030
 reduction targets in order to leverage limited available resources to support both mitigation
 and adaptation efforts, and to take into account the critical role that natural resources play in
 achieving GHG reductions.
 - a. As two sides of the same coin, mitigation and adaptation need to be bridged and discussed more robustly throughout the Scoping Plan. Several examples of the "future proofing" of buildings and communities are available for extreme heat and other climate change impacts. We encourage ARB to leverage these resources and examples to create a closer link between mitigation and adaptation efforts.
 - i. High performance buildings are more resilient and protective, compared to those meeting only current code requirements. Various types of residential buildings in New York City stayed at survivable temperatures much longer during power outages during heat waves or cold spells, <u>based on modeling</u> work.















- ii. The UK's Climate Information Program has provided probabilistic weather projections for future years. As of 2014, this tool has been used for <u>numerous</u> <u>risk assessments</u> and over £3 billion worth of <u>building projects</u> around the UK. Although some building designers and software firms in the U.S. are beginning to use future climate projections to assess building designs for climate change vulnerability, a more robust tool for designers, builders, and communities is needed.
- b. There are numerous and credible peer-reviewed journals and analyses (e.g. from the <u>Carbon Cycle Institute</u>) that demonstrate quantifiable GHG reductions via carbon sequestration from urban and rural forests, as well as from wetlands, agriculture, and other green infrastructure. While the Proposed Plan suggests using data currently in the early stages of development, there are readily available scientific findings and recommendations from natural resource stakeholders that can be included immediately. Additionally, advancing regional understanding of the benefits and how to finance and incentivize green infrastructure (in terms of permitting, building, maintaining green infrastructure projects), via workshops and white papers would be particularly impactful.
- c. Scientists and government officials have declared that there are 102 million dead trees in California's forest, greatly increasing the risk of wildfire the single largest contributor of black carbon, a dangerous short-lived climate pollutant. However, the State has not set targets for reducing wildfire emissions in order to reduce black carbon, and to protect and increase carbon storage in California's forests and grasslands.
 - i. Although the State has not accepted protocols for identifying and measuring baseline carbon and the benefits of protecting against massive wildfire because the State views wildfire as a "natural occurrence," CalFIRE has determined that 95% of wildfires are human-caused and interventions to reduce risk are human actions that can be modeled. Additionally, emissions reduction targets are listed for "unplanned structure fires" and "unplanned vehicle fires" in the urban landscape section of the Proposed Plan. Similar targets should be set for "unplanned wildfire."
 - ii. The emissions from the 2013 Rim Fire were equivalent to a full year of motor vehicle emissions in Los Angeles County. In order to avoid shifting our forests to become net carbon emitters that can negate the reductions achieved in other, more urban-focused programs, we recommend ARB immediately integrate the use of natural and working lands as carbon sinks and to manage them accordingly.















- iii. The Governors' Climate and Forest Task Force, which California is a founding member of, developed forest protocols and project criteria and standards that could be applied to forest sector projects. The Task Force also calls for initiating pilot projects to provide feedback for revising criteria and standards to launch projects now that have benefit while simultaneously monitoring, ground-truthing, and improving modeling and evaluation assumptions that California could have a leading role in advancing.
- iv. While other sector strategies call for structural shifts and investment in technologies and capacity-building, the forest sector goals are limited to what can be accomplished with the resources at hand. This disconnect needs to be addressed. USFS and CalFIRE have each indicated that 500,000 acres need to be treated each year for the next 10 years to address the scale of our forest health problem. Untreated, this problem and the cost of dealing with it will likely grow ever more severe. We encourage ARB to embrace innovation to confront the problem at hand.
- v. We recommend using the Scoping Plan to mandate forest biomass for energy and fuel production, as well as other marketable products, as a tool to improve forest condition, reduce the impacts of tree mortality, and offset fossil fuel combustion by encouraging increased levels of forest and fuel treatments. We recommend reducing the cost of biomass energy production by instituting subsidies at pre-1997 levels to bring biomass more in line with other subsidized sources like wind and solar. We also recommend setting a bio-energy production goal in line with previous levels of production in the 850-900 MW range.
- vi. We recommend that the establishment of a biomass working group be established as quickly as possible so that coordinated statewide approaches to biomass can be quickly implemented. This is especially important considering upcoming organic diversion requirements as well as for strategies to address wood waste generated from the tree mortality crisis. This working group should include a diverse set of stake holders, including industry representatives from the agriculture and forestry sectors, as well as key local government and federal representatives.
- vii. Finally, constraints on federal land need to be addressed, which include topography and use limitations (mechanical treatment could be limited to just 20% of federal land in some locations), the lack of funding for new or upgraded technology, and funding imbalances between fire prevention vs. fighting. Additionally, important co-benefits – public health, offsetting dirtier fuels,















economic growth opportunities, forest health, and water quality – have not been adequately captured or internalized.

- We recommend including a robust discussion on strategies to ensure full engagement and benefit across all of California for State climate investments and programs through a regional approach.
 - a. Many underserved communities and vulnerable populations, particularly in low-income rural communities, are not captured by the methodology used to identify disadvantaged communities (DAC) in CalEnviroScreen. To address this in the short-term, we recommend creating rural provisions in all programs, where practical, modeled after the Rural Innovation Project Areas in the Affordable Housing and Sustainable Communities program, to require a portion of investments within each program to be dedicated to projects in rural regions. Additionally, establishing an investment "floor" on a regional basis will help to ensure a more equitable distribution of funding across the state.
 - b. Beyond the aforementioned short-term strategy, we recommend ARB develop a regional approach that recognizes the distinctions between different parts of the state where emissions reduction goals, low-income/DAC identification, funding distribution, and technical assistance/capacity-building strategies are developed on a regional basis. Additionally, we encourage ARB to facilitate an ongoing dialogue throughout the state about rural needs and issues without such dialogue and support, rural regions who are home to critical watershed, carbon sinks, and other core components of California's mitigation efforts may shift to net emitters, and the people in these regions will remain alienated and less likely to support the policies and programs necessary to meet statewide emissions reduction targets unless proper funds and resources are allocated.
 - c. Many transportation and housing programs are structured to be implemented through metropolitan planning organizations (MPOs). However, this format excludes vast rural portions of the state that do not have MPOs or similar regional agencies. While there are fewer people living in rural areas, they typically need to drive longer distances per trip to get to work, school, grocery stores, and critical service providers such as medical centers. Additionally, rural areas are often most affected by rent burden, the percentage of their income devoted to housing, and would benefit greatly from affordable housing programs. This is another example of how a regional investment floor would help to provide benefits across all of California.
 - d. Weatherization provides multiple benefits to low-income residents throughout California – providing energy savings, improving public health, building resilience, and creating jobs. We encourage ARB to aggressively track and measure the energy savings from low-income weatherization programs funded by the Greenhouse Gas Reduction















Fund to adequately capture the full impact of this key strategy. Further analysis on a regional basis can help state agencies make strategic investments in regions that have not yet received the support needed to implement broad-scale weatherization programs.

- e. In response to California's 2000-2001 energy crisis, the California Energy Commission adopted the policy of the "loading order" of first implementing energy efficiency and demand response before installing renewable and distributed generation (with fossil fuel energy generation occurring as a last resort). California was the first state in the United States with this policy. Leveraging this early leadership, we recommend ARB continue to provide regional assistance to municipalities, other public agencies, and governmental entities including the Department of Defense to help identify barriers to energy efficiency create programs that meet energy efficiency goals in Climate Action Plans.
- 4. We recommend elevating health and health equity as central to the Scoping Plan.
 - a. We acknowledge the considerable improvements made in the Proposed Plan compared to past versions and encourage ARB to continue making improvements to better address how climate change, in addition to air quality, impacts health. Extreme heat, extreme weather events, drought, flood, and diseases have clear public health implications, particularly for vulnerable and low-income populations that experience increased levels of risk and exhibit lower levels of adaptive capacity due to ability and/or resource constraints. We encourage ARB to conduct a health impact assessment (HIA) of the full range of emissions reduction strategies in the Scoping Plan, by leveraging research and resources that have already been conducted and developed, to quantify health impacts to the greatest extent possible prior to finalizing the Scoping Plan.

- i. The HIA should allow for full understanding of the potential beneficial and adverse health impacts and associated costs, including an assessment of the relative health benefits and health costs of different strategies with each sector. The health impacts should go beyond those related to air pollution to include the multiple chronic disease prevention benefits associated with reduced vehicle miles traveled and associated land use patterns, physical and mental health benefits associated with urban greening and green infrastructure, and potential health impacts of biomass and storage technologies.
- ii. The Scoping Plan should include health and health equity metrics, as well as forecasts of the health impacts of a range of climate impacts and the monetized costs of those impacts. Consideration should also be given in evaluating the impacts of locating populations along heavily used transportation corridors, and















in encouraging local government to use their broad discretion over land use, beyond CEQA, to consider these impacts.

- b. We recommend including a more robust discussion of health co-benefits from active transportation in the Scoping Plan. In addition to tracking the absolute magnitude of increases in active transport, utilizing a regional approach to prioritize investments will lead to more equitable distribution to regions that require support, such as the San Joaquin Valley, to effectively increase levels of active transport. Additionally, creating more transportation options through walking and biking can potentially have larger impacts for lower-income populations that generally have reduced access to individual motor vehicles.
 - i. We encourage ARB to include tangible strategies to increase active transportation levels local communities such as outreach and education, infrastructure improvements, pricing mechanisms, urban forestry, bike sharing services, in-fill development, and smart land use practices. The new <u>Increasing Walking</u>, <u>Cycling</u>, and <u>Transit</u>: <u>Improving Californians' Health</u>, <u>Saving Costs</u>, and <u>Reducing Greenhouse Gases</u> report released by the California Department of Public Health provides technical analyses that demonstrate positive health impacts from active transport and other transportation-related GHG mitigation strategies.
 - ii. We recommend pointing to local plans and initiatives that can serve as a model to other communities, such as the <u>Active Design for a Healthy Sacramento</u> <u>County</u>, the County's design guidelines.
 - iii. We encourage ARB to integrate and leverage data from recently published reports that highlight the important connection between equity, such as <u>Lifting</u> the High Energy Burden in America's Largest Cities: How Energy Efficiency Can <u>Improve Low Income and Underserved Communities</u> and <u>Energy Efficiency Jobs</u> in America.

101-1 cont.















Thank you for your consideration of our comments. We welcome the opportunity to discuss any of our comments in greater detail and to help draft language for inclusion in the final Scoping Plan Update.

Sincerely,

J-12-P-4y

Jonathan Parfrey, ARCCA Chair

The Los Angeles Regional Collaborative for Climate Action & Sustainability

Kerri J. Zimmer_

Phlin 2m

Kerri Timmer, ARCCA Vice Chair

Sierra Climate Adaptation & Mitigation Partnership

Kuthleen be

Kathleen Ave

Capital Region Climate Readiness Collaborative

Phil Gibbons

San Diego Regional Climate Collaborative

Kate Meis

Local Government Commission













LOS ANGELES COUNTY
SOLID WASTE MANAGEMENT COMMITTEE/
INTEGRATED WASTE MANAGEMENT TASK FORCE
900 SOUTH FREMONT AVENUE, ALHAMBRA, CALIFORNIA 91803-1331
P.O. BOX 1460, ALHAMBRA, CALIFORNIA 91802-1460
www.lacountyiswmtf.org

Letter 104

April 10, 2017

Ms. Mary Nichols, Chair California Air Resources Board (CARB) 1001 | Street Sacramento, CA 95814

Dear Ms. Nichols:

COMMENTS ON THE DRAFT ENVIRONMENTAL ANALYSIS FOR THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET

The Los Angeles County Solid Waste Management Committee/Integrated Waste Management Task Force (Task Force) would like to express its appreciation to the California Air Resources Board (ARB) for the opportunity to provide comments on the Draft Environmental Analysis (Draft EA) for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Proposed Plan). A link to the Proposed Plan is provided below:

https://www.arb.ca.gov/cc/scopingplan/app_f_draft_environmental_analysis.pdf

Pursuant to Chapter 3.67 of the Los Angeles County Code and the California Integrated Waste Management Act of 1989 (Assembly Bill 939, as amended), the Task Force is responsible for coordinating the development of all major solid waste planning documents prepared for the County of Los Angeles and the 88 cities in Los Angeles County with a combined population in excess of ten million. Consistent with these responsibilities and to ensure a coordinated, cost-effective, and environmentally sound solid waste management system in Los Angeles County, the Task Force also addresses issues impacting the system on a countywide basis. The Task Force membership includes representatives of the League of California Cities-Los Angeles County Division, County of Los Angeles Board of Supervisors, City of Los Angeles, the waste management industry, environmental groups, the public, and a number of other governmental agencies.

The Task Force has several recommendations to include in the Final Environmental Analysis (Final EA):

Ms. Mary Nichols April 10, 2017 Page 2 of 4

General Comment:

 The Final EA or Final Scoping Plan should quantify and compare the emissions, health, and economic impacts of different end uses of organic waste, including biofuels, electricity, pipeline biogas, and compost. 104-1

Specific Comments:

 In describing the impacts of known commitments (beginning on page 12), the Final EA should compare the environmental impacts, including life-cycle greenhouse gas (GHG) emissions, of the use of low carbon fuels as part of the Low Carbon Fuel Standard with the use of zero emission vehicles (ZEVs) as part of the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy.

104-2

• Zero emission vehicles (ZEVs) use lithium batteries. As stated in the Draft EA, the increased use of ZEVs will result in an increased need for lithium battery manufacturing and recycling (page 23). Low-nitrous oxide (NOx) engines fueled by renewable natural gas (RNG) produced from solid waste will result in greater GHG reductions without producing additional hazardous waste in the form of batteries. For certain vehicle types, low-NOx engines using RNG may be a more effective than ZEVs for reducing GHG emissions. In the description of measures under the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy, the Final EA should include a description of the benefits of using low-NOx engines for vehicles such as on-road heavy-duty vehicles (page 18).

104-3

• In the Draft EA, methane reduction measures under the SLCP Strategy (described on pages 61 and 97) and fugitive methane emissions reduction measures (described on page 151) include anaerobic digestion (AD) and composting. The methane reduction measures need to include thermal conversion technology facilities. Conversion technologies (CTs) are a wide array of non-combustion thermal, biological, and chemical technologies capable of converting post-recycled residual solid waste into renewable energy, renewable fuels, and/or useful products. Thermal CT facilities are able to handle a wide variety of wastes, such as contaminated recyclables, medical waste, hazardous waste, or mixed materials such as goods made of more than one type of plastic, for which other processes, such as AD, composting, and recycling, may not be suitable.

104-4

 As stated in the Draft EA, the implementation of the Proposed Scoping Plan could result in an increased rate in turnover of vehicle fleets to increase the use of zeroemission technologies (page 149). The Draft EA also states that these vehicles would need to be recycled or shipped for use outside of California (page 150). The Final EA should include a statement that the use of RNG produced from solid

Ms. Mary Nichols April 10, 2017 Page 3 of 4

waste will result in greater GHG reductions and produce less waste from existing fleets being replaced by ZEVs.

104-5 cont.

• The Draft EA states that anaerobic digesters constructed independently from existing wastewater treatments plants (WWTPs) could create strains on utilities and service systems by requiring supplemental water (page 152). As indicated before, the use of thermal CTs to manage waste needs to be considered because these facilities utilize much less water than anaerobic digesters. Therefore, thermal CTs do not need to be co-located with WWTPs in order to receive an adequate water supply without placing a strain on utilities and service systems.

104-6

• The Proposed Plan includes a goal to increase organics markets (page 122). The Final EA should analyze the impacts of increasing organics markets based on region. Throughout the State, the production of and demand for organic products varies greatly based on region. The analysis should take into consideration the amount and type (woody, green, food, or other) of organics generated throughout the year, where this organic material can be stored, and how it can be stored safely.

104-7

We respectfully request that the above comments/issues be addressed in the Final EA. The Task Force would be pleased to participate in future stakeholder opportunities related to this Plan. Should you have any questions regarding these comments, please contact Mr. Mike Mohajer, a Member of the Task Force, at MikeMohajer@Yahoo.com or at (909) 592-1147.

Sincerely,

Margaret Clark, Vice-Chair

Margaret Clark

Los Angeles County Solid Waste Management Committee/

Integrated Waste Management Task Force and

Council Member, City of Rosemead

cc: Scott Smithline and Howard Levinson, CalRecycle (Waste) Sekita Grant, California Energy Commission (Energy)

Mike Tollstrup and Jack Kitowski, California Air Resources Board (Transportation)
Amrith Gunasekara, California Department of Food and Agriculture (Agriculture)
Frances Spivy-Weber, California State Water Resources Control Board (Water)
David Mallory and Shelby Livingston, California Air Resources Board (Natural Resources)

League of California Cities

League of California Cities, Los Angeles Division

Ms. Mary Nichols April 10, 2017 Page 4 of 4

California State Association of Counties
Each Member of the County of Los Angeles Board of Supervisors
Each City Mayor/Manager in the County of Los Angeles
South Coast Air Quality Management District
South Bay Cities Council of Governments
San Gabriel Valley Council of Governments
Gateway Cities Counsel of Governments
Southern California Association of Governments (Carl Morehouse and Huasha Liu)
Each City Recycling Coordinator in Los Angeles County
Each Member of the Los Angeles County Integrated Waste Management Task Force
Each Member of the Facility Plan Review Subcommittee



Western States Petroleum Association

Letter 105

Credible Solutions • Responsive Service • Since 1907

Catherine Reheis-Boyd

President

April 10, 2017

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814 via e-mail at: rsahota@arb.ca.gov

Subject: WSPA Comments on ARB's 2017 Climate Change Scoping Plan Update

Dear Ms. Sahota:

The Western States Petroleum Association (WSPA)—a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, and other energy supplies in California and four other western states—appreciates the opportunity to provide comments on the Air Resources Board's (ARB) 2017 Climate Change Scoping Plan Update.

We are encouraged by the Board's decision to postpone adoption of the Scoping Plan Update to a later date and look forward to the opportunity to work with the Board and staff to further develop the plan. The additional time should allow for a more robust public process.

The additional time is also necessary because the current proposal has several placeholder statements indicating ARB's intent to provide additional information at some future date. This additional information will be important for Board members to have in order to fully review and deliberate Scoping Plan policy options.

The Board's need for additional information was evident in their comments at the February 16th Board meeting, where Board members requested more detail, including better data on the alleged correlation between GHG and criteria pollutant emissions, estimates of potential "green jobs" under the staff proposal, the ability of individual sectors to reduce GHG emissions and uncertainties related to the proposed use of USEPA's Social Cost of Carbon methodology. All stakeholders would benefit from having this additional information as well as greater clarity on the remaining steps in this update process.

The following comments include specific recommendations for the next draft of the 2030 Scoping Plan Update and related Cap-and-Trade amendments, summarized here for ease of reference:

- ARB should issue a complete revised Scoping Plan Update proposal for a full 45-day public comment period.
- 2. ARB should base this revised proposal on the "All Cap and Trade" scenario which staff acknowledges is a) the least cost path to achieving 2030 target emissions reductions and b) achieves public health benefits that are comparable to the "Proposed Plan" scenario.¹
- 3. ARB should further amend its current proposals for the Cap-and-Trade regulation to restore trade exposure protection in order to minimize the risk of emissions and economic leakage and avoid escalating costs. In addition, current program design features and staff proposals, such as for the Allowance Price Containment Reserve, should be restructured to remove artificial market constraints that would increase the risk of market disruptions and allowance price volatility.
- 4. ARB should eliminate the proposed refinery measure and reassure policymakers that the Cap-and-Trade program will result in direct GHG emissions reductions at individual facilities. There is no need for additional direct measures to satisfy AB 197 (Garcia, 2016) requirements.
- 5. ARB should provide complete documentation of the economic feasibility analysis it conducted on all Scoping Plan scenario alternatives for stakeholder review and comment. This would also allow time for stakeholders to review the regional economic and environmental analyses that ARB indicated during the March 28th workshop would be forthcoming.
- 6. To mitigate misinformation and reduce stakeholder confusion, ARB should more clearly differentiate the role of state climate programs to reduce GHG emissions from the many criteria and toxic air contaminant programs designed to deliver local and regional air quality benefits.

I. Unresolved Issues

Our review of the draft document finds the following issues remain unresolved:

- WSPA appreciates ARB's inclusion of a Cap-and-Trade focused scenario (All Cap-and-Trade Scenario Alternative 3) in Section II of this proposal. We find that a more robust consideration of this scenario is merited. For example, while the summary data provided in the staff presentation for the March 28, 2017 workshop is helpful, ARB should provide the full economic impact analysis information for this scenario in Appendix E. The summary data is helpful in that it allows for direct comparison of each alternative with the Proposed Plan scenario², but ARB should document how these estimates were developed in the next draft of this Scoping Plan Update for 45-day stakeholder review and comment.
- The Scoping Plan Update retains the 20% refinery efficiency measure in the Proposed Plan scenario, despite ARB's inability to identify viable pathways to achieve the targeted reductions and the fact that it conflicts with the findings from ARB's 2013 energy efficiency audit for this sector. ARB actually argues against source-specific measures under Alternative 4 (Cap and Tax), citing potential production cuts, emissions and economic leakage (page 53). The staff

2

¹ 2017 Scoping Plan Update – The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, California Air Resources Board, March 28, 2017, slides 18 and 23.

presentation for the March 28 public workshop specifically states that "Reducing refinery production could have a large impact on fuel prices" and "Reduced production in California will likely lead to leakage of employment and production out of state" (Slide 29). Similar findings are presented by ARB in Appendix J of the original Cap-and-Trade regulatory proposal (2010, pages 40-43). ARB's own findings make the case that the refinery measure should be abandoned.

- ARB retains the 18% carbon intensity reduction target for the Low Carbon Fuel Standard despite
 the well documented uncertainty of achieving the current 10% by 2020 target, the impending
 (2017) review of that target, and the fact that it is one of the least cost-effective emission
 reduction strategies identified in the Proposed Plan scenario³.
- ARB acknowledges that the Social Cost of Carbon methodology attributed to USEPA is still a
 work in progress, and yet proposes to use it to adjust economic impact estimates for Scoping Plan
 scenarios as if it were consensus government policy.

 It also bears repeating that while AB 197
 requires consideration of "social costs", it does not require use of this methodology.
- ARB continues to rely heavily on the PATHWAYS model to support the Proposed Plan scenario. PATHWAYS underestimates costs for key variables, ignores potential barriers to consumer acceptance while requiring changes in lifestyle and living environment and does not evaluate the feasibility of any of the given policy scenario. The few changes in the proposed Scoping Plan Update which appear responsive to problems previously identified by ICF Consulting⁵ actually introduce new problems. For example, use of the Biofuel Supply Module to address lifecycle transportation emissions understates the cost of finished fuels and their delivery to California.

WSPA requests that ARB reconsider these issues and the balance of our comments on ARB's discussion draft⁶ that are not reflected in this Scoping Plan Update.

II. ARB 2030 Target Scoping Plan Update Objectives - Proposed Plan vs. All Cap-and-Trade

³ A separate analysis by NERA Economic Consulting (*Economic Impacts of Major California Climate Change Goals, August 2, 2016*) estimated that achieving a <u>15%</u> reduction in carbon intensity by 2030 would cost in excess of \$900 per metric ton. This document was submitted to ARB on August 10, 2016 by the California Manufacturers and Technology Association (CMTA) in response to ARB's June 17, 2016 Scoping Plan Update Concept Paper.





FINAL_NERA_Econo CMTA 2030 Scoping mic_Impacts_of_Calif Plan- Supplemental Co

⁶ WSPA Comments on ARB's discussion draft 2030 Target Scoping Plan Update, submitted December 16, 2016:



WSPA Scoping Plan Comments December

⁴ Technical support documents for estimating the Social Cost of Carbon, methane and nitrous oxide have been withdrawn pursuant to the Energy Independence and Economic Growth Executive Order issued on March 28, 2017: https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1.

³ Review of E3 PATHWAYS Modeling, ICF Consulting, December, 2016.

WSPA generally agrees with ARB's findings in Section II D that the non-Cap-and-Trade policy scenarios (Alternatives 1, 2 and 4) do not achieve the policy objectives in Section II C. Accordingly, these alternatives should be eliminated from further consideration. However, we challenge ARB's assertion that the Proposed Plan scenario would be the most effective approach to achieving the Section II C policy objectives. ARB should reconsider its current position in light of the following observations and recommendations.

Achieve the 2030 target

Under both the Proposed Plan scenario and the All Cap-and-Trade scenario, the declining cap ensures that the 2030 GHG emissions reduction target will be achieved. Alternatives 1, 2 and 4 are highly unlikely to meet the 2030 GHG target. However, greater reliance on sector-specific measures under the Proposed Plan scenario increases overall program uncertainty as well as the risk of future market disruptions and reactive policy changes. For example, if certain measures prove to be technologically infeasible or cost prohibitive, the Cap-and-Trade program to will have to compensate for the underperforming measures. This outcome offers no advantage in terms of achieving the 2030 target, but could result in stranded assets and investments, emissions leakage and localized and statewide economic impacts.

Provide direct GHG emissions reductions

ARB has stated publicly that the Cap-and-Trade program will result in direct emissions reductions at regulated facilities. Thus, there is no need to add new stationary source measures to the current suite of programs to satisfy the requirements of AB 197. Moreover, given ARB's own findings about the potential pitfalls of direct measures noted under Section I above, adding new stationary source measures would be in direct conflict with ARB's statutory mandate to minimize emissions and economic leakage.⁸

Provide air quality co-benefits

The proposed Scoping Plan Update document and related public discussions are largely silent on the extensive network of existing air quality regulatory programs. These programs have reduced regional and localized emissions of criteria and hazardous air pollutants such as ozone forming pollutants by 50% and toxic air contaminants by 80% since 1990 from all criteria and toxic air emission sources. Sources subject to the Cap-and-Trade program account for only 5% of total criteria air pollution. In addition, ARB's assumption of a 1:1 relationship between changes in GHGs, criteria pollutants and toxic air contaminants (Table III-1, page 57), without reference to any empirical evidence, contributes to the growing misinformation about the value of its own programs. ARB's own analysis showed less than a 1% additional improvement in criteria pollutant reductions when measures are implemented to reduce GHGs. 10

⁷ The 2017 Climate Change Scoping Plan Update, California Air Resources Board, January 20, 2017, Figure II-2 ("Uncertainty Scenario"), page 41.

⁸ Health and Safety Code § 38562(b)(8).

California's Progress to Clean Air, California Air Pollution Control Officers Association, 2015, page 4.
 Air Resources Board Proposed Cap and Trade Regulation, Appendix P – Co-Pollutant Emissions Assessment,
 October, 2010: https://www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf.

Minimize emissions leakage

Greater reliance on sector-specific measures such as the proposed Refinery Measure increases the marginal costs of production in California relative to jurisdictions without comparable regulations, increasing the risk of emissions leakage. The All Cap-and-Trade scenario allows greater flexibility to achieve required emission reductions at a lower cost, mitigating the competitive disadvantage faced by in-state producers. This approach clearly provides greater leakage protection than the Proposed Plan scenario and thus is more responsive to ARB's statutory mandate to minimize emissions leakage. ¹¹

105-1

Support climate investment in disadvantaged communities

A well designed Cap-and-Trade program will generate a stable revenue stream to support climaterelated investments in both urban and rural disadvantaged communities. By contrast, continued expansion of complementary measures will tend to depress the carbon market and increase the frequency of undersubscribed auctions. This leads to the misinformed view that Cap-and-Trade is not achieving reductions, when in fact the complementary measures are undermining the efficacy of the Cap-and-Trade program. A February, 2017 report from the Legislative Analyst's Office identifies complementary policies as a likely contributing factor to the low demand for allowances at recent auctions.¹² Thus, the state's ability to fund climate investments in any community will be less certain under the Proposed Plan scenario than under the All Cap-and-Trade scenario.

Protect public health

As noted above and documented in ARB's analysis supporting adoption of the original Cap-and-Trade regulation¹³, protection of public health at the regional and local level is achieved predominantly through successful and ongoing criteria and toxic air pollution regulatory mechanisms unrelated to California's climate programs. ARB further acknowledges in the staff presentation for the March 28 public workshop that the Proposed Plan scenario will not result in better public health outcomes than the All Cap-and-Trade scenario (slide 18).

105-2

Facilitate sub-national and national collaboration

California is much more likely to advance global climate objectives through effective climate program leadership than solely through in-state GHG emission reductions attributable to its own programs. A well-designed Cap-and-Trade program that accounts for the majority of emissions reductions between 2021 and 2030 would send an important signal to sub-national and international jurisdictions, including potential linkage partners, that California is committed to a stable market-based program. In addition, program features such as compliance offset credits create mechanisms by which other jurisdictions can participate in the carbon market and deliver GHG emissions reductions ahead of their own regulatory actions. By contrast, policies that constrain compliance flexibility and

¹¹ Health and Safety Code § 38562(b)(8).

¹² The 2017-18 Budget: Cap-and-Trade, Legislative Analyst's Office, February, 2017, page 14.

¹³ Air Resources Board Proposed Cap and Trade Regulation, Appendix P – Co-Pollutant Emissions Assessment, October, 2010: https://www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf.

increase program costs, such as greater reliance on sector-specific measures, sharp reductions in industry assistance and new restrictions on offset use, discourage collaboration with other jurisdictions.

Support cost-effective and flexible compliance

ARB acknowledged in staff presentations during the February 9 public workshop (slides 36-37) and the March 28 public workshop (slide 23) that the All Cap-and-Trade scenario is the least-cost approach among all the alternatives evaluated in the proposed Scoping Plan Update. Greater reliance on Cap-and-Trade provides greater flexibility to compliance entities to achieve more cost-effective emissions reductions in a manner that reduces the administrative burden of implementing and complying with GHG regulations, consistent with ARB's statutory mandates.¹⁴

Support Clean Power Plan and other federal action

To the extent that the federal Clean Power Plan (CPP) survives the pending judicial challenge, the Proposed Plan scenario does not provide a clear advantage relative to the All Cap-and-Trade scenario as a CPP compliance mechanism. Presumably, either plan would provide a sufficient basis for an equivalency determination by USEPA.

Based on all of these findings—which by and large are derived from ARB's own analysis—ARB should base the 2030 Target Scoping Plan Update on the All Cap-and-Trade scenario since it clearly provides the best path forward on all counts.

III. Program Isolation and Leakage Risk Under Proposed Plan

ARB acknowledges its inability to predict innovation patterns or potential costs and benefits of the measures in its Proposed Plan scenario (page 67). However, it continues to embrace unproven technologies and expectations of widespread climate action by other jurisdictions. At the same time, it fails to incorporate reasonable safeguards to prevent emissions leakage and economic dislocation in the event that real world conditions do not track the agency's vision for the future.

The commitments made by most international jurisdictions to date are conditional or intensity based, or both. Further, jurisdictions with GHG emissions profiles comparable to California have established much more modest targets. For example, Australia's GHG emissions are about 1.5 times those of California. Australia has pledged a 26-28% reduction in emissions in 2030, but using 2005 emission levels as its baseline. For the comparable time period, California is targeting reductions of about 45%. Malaysia's GHG emissions are approximately half those of California. Malaysia has committed to an *emissions intensity* reduction of 35% from 2005 to 2030, with an additional 10% conditional on external support. 15

The actions of these and other jurisdictions, and the reality that California will not realize climate benefits from its own unilateral actions, suggest that it would be reckless for California to pursue its post-2020

¹⁰⁵⁻³

¹⁴ Health and Safety Code § 38562(a) and (b)(7).

¹⁵ Paris 2015: Tracking country climate pledges; September 16, 2015: https://www.carbonbrief.org/paris-2015-tracking-country-climate-pledges.

targets in the absence of course correction mechanisms to address both foreseeable and unforeseeable circumstances.

ARB dismisses an estimated economic impact of 0.5% of state GDP, based on model runs of the Proposed Plan scenario, as insignificant. This estimate equates to approximately 100,000 jobs. During the February 9 public workshop, Professor James Bushnell (UC Davis) stated that this estimated loss could be much greater if potential impacts are not modeled correctly. It is also important in this context to observe that the 7% "domestic drop" benchmark used in calculating ARB's proposed industry assistance factors for a post-2020 Cap-and-Trade program is equivalent to the drop in economic output during the Great Recession. ¹⁶ California lost approximately one million jobs during this recession.

ARB claims the California industrial sector is the largest in the US, but it is well established that California is losing ground to other states, and that trend is likely to accelerate under ARB's Proposed Plan scenario. According to the National Association of Manufacturers¹⁷, if current rates of industrial growth are maintained, Texas will overtake California as the largest manufacturing economy in the U.S. in less than 5 years. In 2015, the last year for which U.S. manufacturing investment data is available, California ranked among the lowest of all the states, attracting only 1.5% of total U.S. manufacturing investments. This is even before considering the potential for more aggressive GHG emissions reduction measures to further degrade the competitiveness of industry in California. We note that ARB cites Tesla's Fremont plant as a model for the new California economy (page 94), but neglects to mention that Tesla specifically chose to build its battery plant in Nevada instead of California. Tesla's actions are better characterized as an indicator of the decline of California manufacturing.

IV. Refinery Measure Assumptions

ARB's proposed refinery measure is not likely to provide additional reductions in criteria pollutants or toxic air contaminants and will not yield additional GHG reductions. ARB staff estimates that the proposed Refinery Measure would reduce PM 2.5, the criteria pollutant most commonly associated with localized health impacts, by less than 0.1 ton per day. ARB has offered no evidence that these minimal reductions would not be achieved under the State Implementation Plan. The refinery measure is also one of the least cost-effective measures identified in staff's Proposed Plan, with estimates ranging from \$70-\$200 per metric ton of GHG (page 65). Recent investments in energy efficiency upgrades in this sector documented by ARB¹⁹ suggest that there are limited opportunities for additional efficiency gains. The 20% target assigned to this measure seems infeasible under any conceivable program design alternative. The refinery measure does not provide additional greenhouse gas reductions because refineries are already under the cap. Any GHG reductions achieved by refineries will be negated by increases in emissions from other sectors under the cap.

V. Mobile Source Assumptions

105-3 cont.

https://www.minneapolisfed.org/research/economic-policy-papers/accounting-for-the-great-recession

http://www.nam.org/Data-and-Reports/State-Manufacturing-Data/

http://www.cmta.net/multimedia/20160516 mfg investments by state 2015.pdf.

¹⁹ ARB's own energy efficiency and co-benefits audits for the refining sector have demonstrated that an additional 20% reduction in energy use from this sector is not feasible.

WSPA has noted in comments on prior iterations of this Scoping Plan Update process that ARB's current economic modeling for the transportation sector assumes, without supporting evidence, that the state will realize large reductions in fuel costs associated with rapid penetration of zero emission vehicles (ZEV). ARB's proposed ZEV penetration rate greatly exceeds historical trends and market expectations for the target timeframe.²⁰ ARB also fails to account for the cost of subsidies necessary to bridge the price gap between conventional vehicles and zero emissions vehicles. The availability of infrastructure to support large scale deployment of zero emission vehicles is yet another unknown variable. We remain concerned about the potential bias introduced through unsupported, improbable assumptions and incomplete cost accounting that are likely to significantly understate cost estimates for any of the alternatives evaluated in this Scoping Plan Update.

VI. Studies and Modeling

Economic Modeling of All Cap-and-Trade Scenario

The staff presentation during the February 9 public workshop indicates that ARB has evaluated an All Cap-and-Trade scenario and has stated that this scenario would be the least cost approach to achieving the 2030 emission reduction target. Yet ARB did not include any information on the draft economic analysis for this scenario in its proposed Appendix E, which is currently limited to three scenarios: the "Proposed Plan", "No Cap and Trade" and "Carbon Tax". While we appreciate the summary information provided in the staff presentation at the March 28 workshop, and the acknowledgement in Appendix E that the economic analysis is ongoing and that additional information will be included in the final release of the 2030 Target Scoping Plan, this approach denies meaningful stakeholder review, testimony and Board member consideration of ARB's Scenario 3 analysis. As we have observed in prior comment letters, depriving stakeholders and the Board of pertinent information undermines the deliberative process and leads to poorly informed decisions.

WSPA requests that ARB release the full economic modeling and staff analysis for Scenario 3 as soon as possible, provide a full 45 days for stakeholder and Board member consideration of this information, and allow a reasonable period of time for staff to respond to comments and revise the relevant Scoping Plan documents before the Board considers a vote on a final staff proposal.

Program for Environmental and Regional Equity Report

The discussion and analysis in this proposed 2030 Target Scoping Plan Update references a report from the University of Southern California's Program for Environmental and Regional Equity (PERE)

²⁰ Review of E3 PATHWAYS Modeling, ICF Consulting, December, 2016, page 9: "The unconstrained deployment of battery electric vehicles, for instance, can lead to a scenario such as the High BEV Scenario, which assumes that by 2025, 35 percent of the market for light-duty vehicles is captured by plug-in electric vehicles; more than two times higher than what is currently forecasted in California. Furthermore, if we assume, as CARB has in the development of the EMFAC model, that electric vehicles will be limited to passenger cars (and not deployed in light trucks), then this effectively assumes that more than 50 percent of all passenger cars sold in California are either battery electric vehicles or plug-in hybrid electric vehicles, representing a near 20-fold increase from today, and a 10-fold increase compared to the deployment of hybrid electric vehicles today."

²¹ 2017 Climate Change Scoping Plan Update, California Air Resources Board, February 9, 2017, slide 36.

published in September, 2016, entitled: "A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program." The PERE report suggests that the Cap-and-Trade program has resulted in in-state GHG emissions increases for several regulated sectors while significant program-level emissions reductions are associated with offset projects located outside of California. This report has been cited as the basis for assertions that facilities "using the Cap-and-Trade system are adversely impacting environmental justice (EJ) communities." It appears to be accepted by some stakeholders and some Board members at face value despite the fact that the premises upon which it is based are largely incorrect. These deficiencies include, but are not limited to, the following:

- Criteria pollutants such as PM₁₀, directly emitted from large GHG sources, do not cause the elevated particulate levels that pose the greatest health risks in disadvantaged communities.²⁴
- While some large GHG emitters are using offset credits to meet a portion of their allowance obligations, this use is limited to 8% of the entity's compliance obligation.
- The Cap-and-Trade program was never intended to be a control strategy for criteria pollutant emissions.

Furthermore, as ARB observes in its proposed Scoping Plan Update document starting at page 54, existing federal, state and local air quality regulatory programs will continue to reduce criteria and hazardous air pollutant emissions through a comprehensive network of direct and indirect control measures. These measures are applicable to all emissions sources, including those covered by the Capand-Trade program. According to ARB, they have resulted in significant emissions reductions and corresponding air quality improvements, including in disadvantaged communities, despite the growth in population and vehicle use that has occurred over the same time period²⁵ (see also Section II "Provide air quality co-benefits" above).

The current discussion around the PERE report promotes the wrong policy outcomes by suggesting that climate programs should be leveraged for criteria and hazardous air pollutant emissions reductions, even though they were not designed for this purpose and are an inefficient means of achieving reductions of pollutants with localized impacts. The PERE premise is at odds with California's mature air quality regulatory structure, available evidence and expert opinion. For example, the Advisory Council to the Bay Area Air Quality Management District, which includes individuals with relevant subject matter expertise, issued a report in February stating "Unlike toxics and criteria pollutants, for which effects of concern typically occur adjacent to emitting sources (tens of meters) or near-downwind (hundreds of

²³ http://caleja.org/2016/09/new-report-highlights-equity-flaws-in-californias-cap-and-trade-program/
²⁴ Response to PERE's Environmental Equity Assessment of California's Cap-and-Trade Program, Sierra Research, March, 2017.



²⁵ Air Quality Progress in California Communities, California Air Resources Board, June 23, 2016, slide 10.

105-5 cont.

^{22 &}quot;A Preliminary Environmental Equity Assessment of California's Cap-And-Trade Program", Cushing, Lara J., M. Wander, R. Morello-Frosch, M. Pastor, A Zhu and J Sadd, September, 2016; http://dornsife.usc.edu/assets/sites/242/docs/Climate_Equity_Brief_CA_Cap_and_Trade_Sept2016_FINAL2.pdf ("PERE Report")

meters to several kilometers), the relevant effects of climate change (and the GHGs that cause it) are global."²⁶ The Council's report concludes that because the effectiveness of toxics and criteria pollutant programs has been "amply demonstrated", toxics and criteria pollutant emissions should be "regulated directly through such established programs, rather than indirectly as co-benefits of GHG reduction policies."²⁷

105-5 cont

The attached critique of the PERE report, prepared by Sierra Research, addresses these and related issues in greater detail. WSPA submits that absent further evaluation, including external peer review by objective subject matter experts, this report cannot be used to inform decisions on the Scoping Plan Update or the Cap-and-Trade program.

Cost-Benefit Analysis of Proposed Refining Measure

ARB's cost-benefit analysis for the petroleum refining sector does not make sense. ARB identifies "levelized capital costs" of \$0.1 billion for the refining sector from PATHWAYS (Table III-4, page 69) yet ARB's estimated cost in 2030 for the refining measure alone is \$70-200 per metric ton (Table III-3, page 65). If ARB is expecting to achieve 30 million metric tons of GHG reductions from a refinery measure (Figure II-2, page 41), then the annualized capital costs for the refining sector would range from \$0.2-0.6 billion, even before accounting for any costs beyond the refinery measure.

ARB states on page 93 that "existing refineries have an opportunity to move away from fossil fuel production." This simplistic view is unsubstantiated and suggests a poor understanding of refining logistics and economics. For example, even a relatively small refinery would require volumes of renewable feedstock that currently do not exist, and the cost of the infrastructure to produce and ship such volumes to a given facility, coupled with the facility investments necessary to process renewable feedstocks, would likely be prohibitive at scale. Such statements reinforce the concern that ARB's Proposed Plan scenario is not feasible and could result in stranded investment, regulatory uncertainty and potential emissions and economic leakage due to diversion of investment from California

NERA Review of ARB's Economic Impact Analysis

WSPA retained NERA Economic Consulting to provide an expert third party evaluation of ARB's economic impact analysis of the policy alternatives identified in this Scoping Plan Update. ** NERA's analysis and findings are included as an attachment to this letter. The scope of NERA's review is necessarily limited to publicly available information. Since ARB has acknowledged that the Scoping

²⁶ Advisory Council Opinion on Green House Gas (GHG) Caps at Bay Area Refineries, February 15, 2017, pages 3-4:



2017.2.22AdvisoryCouncilOpinionExecutiv

²⁸ Review of ARB's Modeling for the 2017 Scoping Plan Update, NERA Economic Consulting, April 03, 2017.



10

²⁷ Ibid, page 3.

Plan Update document and the economic impact analysis presented in Appendix E are incomplete, NERA's findings are preliminary and should be revisited once ARB releases a complete set of documents. Based on the available information, the NERA review offers the following observations and recommendations:

- Key elements of the alternatives analyzed by ARB are internally inconsistent and inappropriate
 for the analysis. For example, ARB uses EPA's Social Cost of Carbon to quantify the benefits of
 California's GHG policies despite the fact that the SCC measures global benefits.
- The models cannot evaluate the feasibility of climate policy alternatives. For example, PATHWAYS cannot represent the impact of allowance price on consumer choice and producer decisions, and REMI cannot account for greenhouse gas emissions. Model predictions are inherently biased and unreliable because the inputs that drive the impacts are specified by the modeler.
- Neither model can optimize consumer or producer behavior. Thus, neither model can be used to
 identify a least cost policy path to achieve the 2030 emissions reduction target.
- The scope of the models should be expanded to better represent economic interactions between California and other jurisdictions, including California's trading partners and Cap and Tradelinked jurisdictions.
- NERA's review recommends that ARB conduct a separate analysis using a Computable General Equilibrium model to properly account for feedback and interactions among sectors within and outside of the California economy.

NERA states that the results from any macroeconomic analysis using PATHWAYS and REMI "should be interpreted with caution because of the shortcomings of each model and the lack of a consistent linkage of the models to represent California's Scoping Plan in totality. Failure to address these shortcomings and other concerns identified by ARB's expert economic advisors will likely understate the potential economic impacts of every policy alternative identified in the Scoping Plan Update. This outcome would leave the ARB Board with a false sense of security about the costs and long-term feasibility of any particular alternative.

OEHHA Report on Cap-and-Trade Impacts in Disadvantaged Communities

In February 2017, OEHHA released an initial report titled, "Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities." The report was prepared in response to a directive by the Governor to analyze possible benefits and impacts to disadvantaged communities from ARB's GHG reduction programs implemented under AB 32. The initial report only evaluates data from the initial years of the Cap-and-Trade Program, during which only certain large stationary sources were covered by the program.

OEHHA's report acknowledges that there are various "challenges" that "preclude definitive conclusions" regarding the impacts of the Cap-and-Trade program on disadvantaged communities. Yet despite these limitations, the authors choose to present findings that are not supported by the report itself or the underlying data. This preliminary report contributes to a growing body of misinformation distorting the

role of GHG reduction programs relative to mature air quality programs that deliver direct public health benefits at the regional and local level. ARB should explicitly reject any suggestion that this report justifies further restrictions on the Cap-and-Trade program or 2030 Scoping Plan scenarios that diminish the role of Cap and Trade. ARB should also document the many limitations of this report in the public record, including, but not limited to the following points:

- The Cap-and-Trade program was never designed or intended to be a control strategy for criteria or toxic pollutant emissions. As noted above, there are numerous long-standing criteria and toxic pollutant emissions control programs that have been extremely effective in reducing emissions from all types of sources, and in improving air quality throughout the state, including in disadvantaged communities. These programs are entirely independent of the state's GHG reduction programs and will continue to regulate criteria and toxic pollutant emissions from a much larger universe of sources than those subject to the Cap-and-Trade program.
- Some facilities in the Cap-and-Trade program report criteria and toxic emissions from activities that either do not have or do not report GHG emissions. For example, cooling towers at power plants and refineries can be sources of PM₁₀/PM_{2.5}, but have no GHG emissions. Backup diesel generators are exempt from reporting under Cap and Trade, but emit diesel particulate matter that is regulated in California as a carcinogen. For communities with these types of sources, alleged correlations between GHG emissions and emissions of criteria pollutants and air toxics will be meaningless at best, and could be misleading, redirecting resources and focus in a manner that does not address real air quality issues.

105-6 cont.

- As OEHHA acknowledges, the criteria and toxic pollutant emission data for Cap-and-Trade sources are more variable in quality than GHG emissions for those sources. This is principally due to inconsistencies in reporting guidelines used by different California air districts and an incomplete statewide database used by OEHHA. Although more accurate emission data exist at the District and facility level, there is too much uncertainty regarding the accuracy of the criteria and toxic emission data in the statewide database to draw any valid conclusions regarding benefits and impacts of Cap-and-Trade except in terms of GHG emissions.
- The Cap-and-Trade program period evaluated by OEHHA included only a subset of GHG sources now subject to program requirements. It is not possible to draw valid conclusions regarding the effectiveness of a program that was not fully implemented during the subject time period.
- The OEHHA study evaluated correlations between GHG emissions and emissions of other pollutants, but public exposure to air pollutants depends on ambient concentrations and not on emissions. For the criteria pollutants of most concern in California, ozone and PM_{2.5}, emissions are not a surrogate for ambient concentrations. For example, ozone emissions are insignificant contributors to ambient ozone, which is formed from oxides of nitrogen and organic compounds through complex chemical reactions in the atmosphere. In the Bay Area, less than 15% of ambient peak PM_{2.5} concentrations are due to PM emitted directly from industrial sources,

thus an assessment of Cap-and-Trade program impacts on $PM_{2.5}$ emissions does not provide useful information on either a localized or regional level.

105-6 cont.

WSPA appreciates ARB's consideration of our comments, and we look forward to your responses. If you have any questions, please contact me at this office, or Tiffany Roberts of my staff at troberts@wspa.org.

Sincerely,

Enclosures

ce: Richard Corey –ARB
Edie Chang - ARB
Mary Jane Coombs – ARB
Tiffany Roberts - WSPA



CALIFORNIA IBEW-NECA LABOR MANAGEMENT COOPERATION COMMITTEE



Letter 109

April 10, 2017

California Air Resources Board 1001 "I" Street Sacramento, CA 95814

Submitted electronically at www.arb.ca.gov/cc/scopingplan/scopingplan.htm

Re: Comments on the 2017 Climate Change Scoping Plan Update

To the California Air Resources Board:

The IBEW-NECA California Labor Management Cooperation Committee submits the following comments on the January 20, 2017 Proposed Climate Change Scoping Plan Update ("Proposed Scoping Plan"). We appreciate the efforts of the Air Resources Board ("ARB") in preparing the Proposed Scoping Plan and accompanying materials.

In order to "spur the transformation of the California economy and fix its course securely on achieving an 80 percent reduction in greenhouse gas emissions by 2050," it is critical the Proposed Scoping Plan set the appropriate expectations to scale up deployment of clean energy and build the momentum needed to reach long-term climate goals. In excluding specific expectations for building decarbonization from the default scenario, we are concerned that the Proposed Scoping Plan does not adequately address greenhouse gas ("GHG") emissions from fossil fuel use in residential and commercial buildings, which is a major source of GHG emissions and an important sector to decarbonize. Building decarbonization is widely recognized as a critical strategy to achieve long-term climate goals that will take time to fully implement.² While renewable gas, i.e. biomethane and

¹ Proposed Scoping Plan Update, ES3.

² In a detailed analysis performed for the California Energy Commission, researchers at Lawrence Berkeley National Lab found that it was necessary to achieve full electrification of all space and water heating, in

power-to-gas, could be part of the solution to minimize emissions in the existing building stock and in end uses that will be hard or will take a long time to electrify, the ability to scale these fuel sources as the main pathway to achieve California's climate goals in an affordable and sustainable manner for buildings has not been demonstrated. In addition, the issue of fugitive emissions across the entire gas supply chain remains unsolved. Lastly, biomethane generates hazardous criteria pollution that can impair the state's ability to meet air quality goals. It is therefore critical for ARB to ensure that building electrification is developed as a viable, scalable and affordable pathway to achieve 2050 climate goals. ARB should amend the Proposed Scoping Plan to:

109-1 cont

- (1) Conduct analysis on the timeline, pathway, and barriers to achievement building decarbonization targets; and,
- (2) Identify activities that are needed by key state agencies to both address policy and market barriers for building electrification and to spur market transformation and deployment in order to achieve above targets.

The Proposed Scenario Should Be Revised to Include Building Electrification and Decarbonization Targets for the 2020 through 2030 Timeframe.

In order to lay the groundwork to achieve long-term climate goals, the Proposed Scoping Plan needs to establish targets for building decarbonization and provide further direction for how to dramatically reduce GHG emissions in buildings in line with California's climate goals. Water and space heating in residential and commercial buildings is a major source of GHG emissions, on par with the emissions from all in-state power plants.

³ As California decarbonizes electricity generation, the buildings sector's share of California's emissions will only grow.

residential and commercial buildings, to meet the 2050 carbon goals. M. Wei et al., Scenarios For Meeting California's 2050 Climate Goals. Lawrence Berkeley National Lab (Sept. 2013), p. 80. https://eetd.lbl.gov/sites/all/files/ca-2050-climate-goals.pdf. Similarly, a report by the Deep Decarbonization Pathways Project corroborated this conclusion and found that electrifying natural gas end uses in buildings was essential in order to reduce greenhouse gas emissions to levels consistent with international climate goals. Williams, J.H., et al. (2014). Pathways to deep decarbonization in the United States. The U.S. report of the Deep Decarbonization Pathways Project of the Sustainable Development Solutions Network and the Institute for Sustainable Development and International Relations. Revision with technical supplement, Nov 16, 2015 ³ California Air Resources Board (CARB) GHG Inventory data shows that over the last five reported years (2010-2014) emissions from the residential and commercial sectors averaged 51 MMT CO2e annually, compared to 48 MMT CO2e for in-state power plants. In the residential sector 90 percent of these emissions were from fuels burned on-site, versus 63 percent for the commercial sector.

2

Decarbonizing buildings is not a "turn-key" strategy, but rather requires significant planning, policy reform, and market transformation. State agencies and other key actors need to begin to plan now to ensure market and policy barriers can be overcome in a timely and cost-effective manner. Absent action today to support and signal building electrification, California can expect the continuation of current construction trends, further entrenching an almost exclusive dependency on natural gas. The building infrastructure that California invests in over the next 13 years will be major sources of GHG emissions well beyond 2030. The Proposed Scoping Plan should prompt and promote clean energy infrastructure planning for the long-term. ARB can trigger this longer term planning and acceleration by including building electrification targets in the Proposed Scenario.

Despite the importance of achieving progress in building electrification within the 2020 to 2030 timeframe in order to meet long-term 2050 emission reduction targets, the Proposed Scoping Plan includes no expectations for building electrification.

The Proposed Scenario's Exclusion of Targets for Building Electrification is Counter to AB 197.

Under AB 197, ARB is required to "prioritize ... rules and regulations that result in direct emission reductions." Because electrifying heating and household appliances eliminates emissions from smaller point sources, this sector should be prioritized.

Below we evaluate building electrification using ARB's metrics to demonstrate that it is a promising addition to the larger state climate strategy.

Criteria	Details for Increased Electrification of Residential and Commercial Buildings
Ability to Reduce GHGs to Meet the 2030 Target	 Incorporates new commitments to reduce emissions from fossil fuel use in buildings, which is a relatively untapped but significant opportunity. As new and existing generation resources that will serve the new

⁴ Cal. Health & Safety Code § 38562.5.

load from building electrification become increasingly renewable, the GHG savings of electrification will increase. This is also a critical component of reducing GHGs beyond the 2030 timeline.
 Lower fossil fuel use and increased electrification will reduce criteria pollutants and toxic air contaminants.
Direct use of fossil fuels in buildings is a major source of GHGs and other pollutants, on par with all in-state power plants. Electrification is a primary strategy to achieve direct emission reductions from the buildings sector.
Electrification of buildings will reduce the need to develop new natural gas infrastructure, thereby reducing fugitive methane emissions across the entire gas supply chain. Replacing fossil gas use in buildings with renewable natural gas, however, does not.
 Provides leadership on how to reduce fossil fuel use in buildings using high efficiency electric technologies. Spurs market transformation and innovation in California. Could provide a policy model for other states to adopt similar measures. Investment in high efficiency electric infrastructure in California will increase the availability of cost effective high efficiency electric equipment across the country as well.
N/A
Reduces GHGs, NOx, VOCs, particulate matter, and other hazardous pollutants. Improves safety by decreasing or eliminating combustion of fossil fuels inside homes and buildings.
Several cost-effective building electrification practices exist today for residential and commercial buildings. The number of cost-effective applications will increase with policy reform and market transformation.
Distributed energy resources like high-efficiency electric heating can help California integrate higher levels of renewable energy by providing demand response and energy storage, thereby supporting the state's ability to decarbonize the grid.

109-2 cont

Accordingly, there is no legitimate basis for excluding building electrification from

the Proposed Scenario as currently contemplated in the Scoping Plan.

The Scoping Plan Should Also Include Analysis on the Timeline, Pathway and Barriers to Achievement of Building Decarbonization Targets.

In addition to including building electrification goals in the Proposed Scenario, the Scoping Plan should provide analysis on the timeline, pathway, and barriers to building decarbonization to ensure goals are achieved by 2030. The timeline and pathway analysis could include various scenarios exploring different mixes of electrification, decarbonized fuels, pace of deployment of these technologies, by sub-sector (residential/commercial), and by end use (space heating, water heating, other gas end uses). Beyond electrification, ARB should conduct analysis on the scalability, affordability, air quality impacts, sustainability, and strategic uses of biomethane and power-to-gas to achieve 2030 and 2050 climate goals in the building sector.

In order to achieve building electrification targets, it is critical that ARB also identify current barriers and challenges, as it has historically done to support the deployment of other technologies like electric vehicles. Construction of all-electric buildings and replacing natural gas appliances with efficient electric alternatives like heat pumps face major implementation barriers, including: (1) higher upfront and operating costs, (2) misaligned state policies and regulations, and (3) awareness and behavioral change.⁵ On the policy side, the state's building energy code is biased in favor of natural gas use in buildings and discourages building electrification, even when that might be the most cost-effective, most efficient, and lowest emissions option.⁶ Additionally, utility programs to incentivize fuel substitution from gas to more efficient electric appliances are hampered by the California Public Utilities Commission's "3-prong test," which has vague requirements and lacks guidance on which test should be performed. The current Cap and Trade framework and existing policies like SB 350 will not be sufficient to lift electrification over these hurdles. As the state agency

⁵Energy Transitions Commission, "A new electricity era: How to decarbonize energy systems through electrification" January 2017. Also see Sierra Club Comments on the Second Update to the Climate Change Scoping Plan, December 16, 2016, for description of market transformation challenges.

⁶For example, Title 24 of the state building code's cost effectiveness test is based on consumer cost projections which do not include societal costs of energy, and do not account for the actions that will be required to achieve the state's climate goals, such as building decarbonization.

responsible for GHG policy implementation strategies, ARB has a critical role to identify the key market and policy barriers and facilitate coordinated action at the agency level to achieve building decarbonization targets in a timely and efficient manner.

The Scoping Plan Should Identify Policies and Activities Needed by Key State Agencies to Achieve Building Electrification Targets.

Building electrification will not occur at sufficient scale without a strong policy framework. While building electrification using high efficiency heat pumps is technologically feasible today and common in parts of the Pacific Northwest, Europe, and Japan, there are currently only a handful of cost-effective applications in California, mostly in new construction and large-scale retrofits. In order to expand and accelerate building electrification as a GHG mitigation strategy, ARB needs to signal the need for policy support from other regulatory agencies, mainly the CPUC and CEC.

Agency support will be critical to overcome policy and market transformation barriers and to unlock the potential of building electrification to curb GHG emissions. As has happened with rooftop photovoltaic, and is currently happening with electric vehicles, incentive programs and other supportive policies from ARB, CEC, CPUC, and other regulatory agencies can help to accelerate market development and transformation. With similar policies for building electrification in place, we expect equipment and installation costs to come down and performance to improve. In addition, policy reform is needed to ensure that thermal storage and demand flexibility of electric heating appliances can help with grid balancing, renewables integration, and the optimization of power plant capacity factors. The inclusion of these grid and carbon benefits in customer rates, and the reduction in equipment and installation costs as the market transforms, have the potential to make electrified buildings a very cost-effective climate mitigation strategy. By both including

⁷ Low-income retrofits with fuel-switching:

⁻Sonoma Court, 60 family apts, Escondido (HVAC and Cooking + solar)

⁻Monterrey Pines, 324 family apts, Richmond (Domestic Hot Water + solar)

⁻Deliverance Temple Phases I and II, 82 family apts, Richmond, CA (Domestic Hot Water + solar)

⁻Ethan Terrace, 92 senior apts, Sacramento (HVAC)

⁻St. Marks, 117 senior apts in a nine stories tall historical hotel, Sacramento (Domestic Hot Water)

⁻The Crossings, 100 family apts, Rialto (Domestic Hot Water + solar)

⁻The Eureka Lodge, 50 senior apts, Eureka (HVAC, DHW, Cooking)

building electrification targets in the Scoping Plan and by identifying key activities and policy opportunities at state agencies, ARB will mobilize the level of broad support and momentum that is needed to realize our climate and air quality goals. ARB has a critical role to play to set a vision and a roadmap that the other agencies can support in order to make substantive progress on building decarbonization in the 2020 to 2030 timeframe.

We appreciate the opportunity to submit these comments and look forward to working with ARB to achieve California's 2030 greenhouse gas reduction requirements.

Sincerely,

Bernie Kotlier

Executive Director, Energy Solutions

IBEW-NECA California Labor Management Cooperation Committee

Coalition for Sustainable Cement Manufacturing & Environment 1107 9th Street, Suite 930 | Sacramento, CA 95814 | (916) 447-9884

Letter 112

April 10, 2017

Ms. Mary Nichols Chair California Air Resources Board 1001 "I" Street Post Office Box 2815 Sacramento, California 95812

Subject: Comments on the 2017 Climate Change Scoping Plan Update

Dear Ms. Nichols:

The Coalition for Sustainable Cement Manufacturing and Environment ("CSCME"), a coalition of all five cement manufacturers in California, provides these comments regarding the 2017 Climate Change Scoping Plan Update issued on January 20, 2017 ("Scoping Plan Update") by the California Air Resources Board ("CARB").

Although it supports the existing Cap-and-Trade Program, CSCME opposes the continuation of the Capand-Trade Program without <u>significant</u> changes to the post-2020 proposed allowance allocation framework for the cement industry. Absent such changes, California cement production will virtually disappear, harming the industry's workers and the communities that they support, shifting California cement consumption toward more GHG-intensive imports, and undermining California's climate change objectives.

CARB's allowance allocation framework under the Cap-and-Trade Program as well as any additional policies and measures must comply with the requirements under AB 32, including but not limited to equitably minimizing costs and maximizing benefits, considering cost-effectiveness, considering overall societal benefits, and minimizing leakage. The proposed allowance allocation framework represents a significant departure from the current approach and fails to satisfy AB 32's mandate to, among other things, minimize leakage. Our future support for the Cap-and-Trade Program, whether under CARB's Proposed Scenario or under Alternative 3 as set forth in the Scoping Plan Update, is contingent on the implementation of an allowance allocation program that ensures the survival of our industry.

CARB also committed to considering a border carbon adjustment ("BCA") for the cement industry to minimize the leakage that necessarily results as the cap adjustment factor reduces the allocation of allowances. CSCME was given assurances that, in the absence of a BCA, the allowance allocation framework would effectively address the increasing future risk of leakage and ensure that the cement industry is not driven out of California. CSCME urges CARB to reconsider the use of an incremental BCA

¹ The Coalition includes CalPortland Company, Cemex, Inc., Lehigh Southwest Cement Company, Mitsubishi Cement Corporation, and National Cement Company of California Inc. There are ten cement plants located in California, eight of which are currently operating.

as an additional measure to comply with CARB's statutory obligations to, among other things, minimize leakage.

The comments below will address, first, why CARB's proposed allocation framework threatens the survival of the cement industry in California, including why the cement industry is uniquely exposed to leakage and the impact of CARB's proposed allocation rate on the California cement industry. Second, after reviewing the applicable statutory requirements, these comments address proposed additional policies and measures, including (a) why any additional regulations to reduce GHG emissions will increase the risk of leakage in the cement sector; (b) why any additional GHG regulations to reduce copollutants will increase the risk of leakage in the cement sector; (c) why CARB should identify a BCA as a necessary additional action to minimize leakage in the cement sector; and (d) why the removal of artificial barriers could contribute to GHG emissions reductions for the cement industry. Finally, CSCME requests that CARB enhance the transparency of its regulatory development process by engaging stakeholders earlier in the development and use of future studies.

CARB'S PROPOSED ALLOCATION FRAMEWORK THREATENS THE SURVIVAL OF THE CEMENT INDUSTRY IN CALIFORNIA

1. The California Cement Industry Is Uniquely Exposed to Leakage

CARB's statutory requirement to minimize leakage is particularly important for the California cement industry, which is at an extreme risk of leakage in both absolute and relative terms.² The cement industry's risk of leakage is based on a confluence of factors, including but not limited to:

- High Exposure to Compliance Costs: Given the very high GHG intensity of the cement industry,
 California cement producers' exposure to compliance costs is extraordinarily high.³ In fact,
 according to CARB's own analysis that was used to support the current allowance allocation
 framework, the cement industry has a GHG intensity that is more than three times greater than
 that of the next most emissions-intensive industry.⁴
- Low Ability to Reduce Exposure to Compliance Costs: The availability of technologically feasible
 and cost-effective abatement opportunities in the California cement industry is limited by a variety
 of factors, including practical inability to substitute lower carbon fuels and the strong incentives
 cement producers already have to use the most advanced and energy efficient production
 technology. The dominant constraint on abatement is the fact that a majority of the cement

² See CSCME, "Comments Related to the Risk of Leakage in the Cement Sector" and Appendix, March 10, 2016, attached to CSCME, "Comments on May 18, 2016 Public Workshop on Emissions Leakage Potential Studies," June 10, 2016, at Attachment 1.

³ See, e.g., CSCME, "Comments Related to the Risk of Leakage in the Cement Sector," March 10, 2016, at 3.

⁴ See CSCME, "Comments on Draft Regulation and Initial Statement of Reasons," September 19, 2016, at 4.

industry's direct GHG emissions are process emissions, which are an unalterable consequence of the chemical process required to convert limestone into cement clinker.⁵

• Limited Ability to Pass Through Realized Compliance Costs: Because cement is a highly interchangeable product, cement producers compete almost exclusively on the basis of price, and even small differences in price are sufficient to induce customers to buy cement at the lowest price (whether from domestic or foreign sources). Given the high level of competition in the California cement market, cement producers cannot pass through realized compliance costs to customers by increasing prices without suffering a loss of market share or profitability.⁶

CARB's Proposed Allowance Allocation Rate Threatens The Viability Of The California Cement Industry

Under the Scoping Plan's Proposed Scenario, CARB's primary means for minimizing leakage in the manufacturing sector is the allocation of allowances to at-risk industries. CARB's proposed allocation framework, however, is a significant departure from its current approach and would result in substantially lower allowance allocation rates for virtually every industry, including cement. CSCME has commented extensively to CARB regarding the fundamental due process, legal, policy, and analytical flaws in its proposed framework, which would significantly increase the risk of leakage.

Under CARB's proposed framework, the cement industry's overall allocation rate will drop overnight from 0.757 allowances per metric ton of cement in 2020 to 0.550 in 2021. The allowance rate will continue to decline to the level at which it is significantly below the industry's process emissions by 2030. As a result, almost 40 percent of the industry's emissions will be "uncovered." Based on CARB's leakage studies and an ultra-conservative carbon price assumption, any attempt to pass through the costs of these uncovered emissions will likely result in a 63% to 79% decline in output – a decline far greater than that experienced during the bursting of the housing bubble and onset of the Great Recession. Two plants, out of the ten in California, failed to survive the Great Recession.

The impact of the proposed allowance allocation framework on the California cement industry cannot be overstated. Such a massive decline in output would necessarily mean that California cement consumption will be replaced with higher GHG intensive cement sourced from abroad, causing massive leakage in violation of AB 32 and California's climate change objectives and irreversibly harming the industry, its employees, and the surrounding communities.

While CSCME strongly supports the use of allowance allocation as a tool for minimizing leakage, CSCME opposes CARB's proposed approach to revising the allowance allocation framework for the post-2020 period. If necessary revisions are made to CARB's proposed allowance allocation framework, however,

⁵ See, e.g., CSCME, "Comments Related to the Risk of Leakage in the Cement Sector," March 10, 2016, at 3-5.

⁶ See, e.g., id. at 5-11.

⁷ See Attachment.

CSCME believes that CARB's proposal to continue the Cap-and-Trade Program could appropriately balance its climate change objectives with preserving the California cement industry.

II. ANY ADDITIONAL POLICIES AND MEASURES MUST COMPLY WITH CARB'S MANDATE TO CONSIDER COST-EFFECTIVENESS AND MINIMIZE LEAKAGE

 CARB Must Comply With All Applicable Statutory Requirements In Implementing Its Climate Change Program

In implementing AB 32, CARB is required to:

Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.

Section 38562(b) of AB 32 also directs CARB to "[c]onsider cost-effectiveness," "[c]onsider overall societal benefits", including "benefits to the economy, environment, and public health," and "minimize leakage."

In August 2016, California enacted AB 197, which included the following provision (emphasis added):

38562.5. When adopting rules and regulations pursuant to this division to achieve emissions reductions beyond the statewide greenhouse gas emissions limit and to protect the state's most impacted and disadvantaged communities, the state board shall-follow-the-requirements in subdivision (b) of Section 38562, consider the social costs of the emissions of greenhouse gases, and prioritize both of the following:

- (a) Emission reduction rules and regulations that result in direct emission reductions at large stationary sources of greenhouse gas emissions sources and direct emission reductions from mobile sources.
- (b) Emission reduction rules and regulations that result in direct emission reductions from sources other than those specified in subdivision (a).

As a threshold matter, AB 197 reiterates CARB's obligation to "follow the requirements in subdivision (b) of Section 38562," which include the requirements specified above — equitably minimize costs and maximize benefits, consider cost-effectiveness, consider overall societal benefits (including benefits to the economy), and minimize leakage. Thus, AB 197 does not permit CARB to ignore or otherwise diminish the requirements under AB 32. Rather, AB 197 simply instructs CARB to consider the social

costs of the emissions of greenhouse gases and prioritize direct emission reductions, provided doing so can be achieved consistent with the existing requirements under AB 32.

Any Additional Regulations To Reduce GHG Emissions Will Unduly Burden, And Increase The Risk Of Leakage In, The Cement Industry

The Scoping Plan Update states that "[w]hile GHG reductions will occur at covered entities under the current design of the Cap-and-Trade Program, CARB has begun the process to evaluate potential changes to program design features that would support greater direct GHG emissions reductions at Cap-and-Trade Program covered entities." One area of evaluation that CARB discusses will be "[r]edesigning the allocation strategy to reduce free allocation at a rate to support increased technology and energy investment at covered entities to reduce GHG emissions."

The implicit assumption in the above statement is that increasing costs (i.e., reducing allowance allocations) will actually increase investment in California. Although this may be true for some industries, it is patently false for any industry that is highly exposed to leakage, as the increased costs will place such an industry at a severe disadvantage to out-of-state competitors that will not face a similar burden. As such, CARB's evaluation of potential changes to the design features of the cap-and-trade program should differentiate industry treatment according to leakage risk.

The Scoping Plan Update provides a useful framework for thinking about additional regulations to reduce GHG emissions in the industrial sector. Specifically, it states that, "[t]hree predominant in-State paths to reducing GHG emissions for the Industrial sector are: fuel switching, energy efficiency improvements, or the relocation of production to outside the State." Due to significant technology and policy constraints, there is ample reason to believe that any direct measures applied to the cement industry will result in emissions leakage.

Fuel Switching. The cement industry's ability to substitute lower carbon fuels in the future is constrained by a mix of market, technical, and regulatory barriers. The vast majority of cement kilns in the United States, including California, currently use either coal or petroleum coke as the primary fuel. In theory, California cement manufacturers could use natural gas as a primary fuel and introduce other alternative fuels to reduce their GHG emissions: (1) scrap tires; (2) wood; and (3) engineered municipal solid waste. In practice, however, each option suffers from its own technical or regulatory barrier. Substitution toward lower-carbon fuels in a cement kiln can often come at the expense of energy and/or production efficiency, which can place an overall limit on the progress that can be made in reducing

⁸ Scoping Plan Update at 40.

⁹ Id. (emphasis added).

¹⁰ Id. at 94.

GHG emissions by switching fuels. 11 Furthermore, increased use of alternate fuels, particularly natural gas, will increase criteria air pollutants such as NO_{x} . 12

Energy Efficiency Technologies. Cement producers already use, and have invested in, the most efficient technology available. All cement plants operating in California currently utilize preheater/precalciner kilns (the most energy-efficient technology available). Moreover, because cement manufacturing is a highly mature process, the prospects for large-scale breakthroughs in more energy efficient production technologies are extremely limited. Finally, given that fuel costs constitute a substantial percentage of total operating costs, cement manufacturers always have a strong economic incentive to invest in cost-effective energy efficiency improvements whenever they exist. As a result of these factors, the California cement industry's opportunities to improve its energy efficiency are exceptionally low.¹³

Leakage. Given the cement industry's unique features and the barriers that are currently in place, the only way to achieve additional GHG reductions would be for production to be relocated outside of California. Because this is clearly an undesirable outcome, CSCME cannot support CARB's efforts to redesign its allocation strategy. According to the Scoping Plan Update,

[e]missions leakage can occur when production moves out-of-state, so there appears to be a reduction in California's emissions, but the production and emissions have just moved elsewhere. This loss in production...could potentially increase global GHG emissions if the production moves to a less efficient facility outside of California.¹⁴

The Scoping Plan Update also states:

While fuel switching and energy efficiency are beneficial strategies, relocation of production to outside the State is disadvantageous for a couple of reasons. First, AB 32 requires the State's climate policies to minimize emissions leakage, and relocation would shift GHG emissions outside of the State, resulting in emissions leakage. Second, it could also reduce the availability of associated jobs and could impact a local tax base that supports local services such as public transportation, emergency response, and social services, as well as funding sources

11 See, e.g., CSCME, "Comments Related to the Risk of Leakage in the Cement Sector," March 10, 2016, at 4-5.

112-1

¹² See, e.g., U.S. Environmental Protection Agency, Alternative Control Techniques Document Update: NO_x emissions from New Cement Kilns, EPA-453/R-07-006 (2007), at 27, 34 ("When fired in the main kiln burner, natural gas has been shown to generate approximately twice the amount of NO_x per ton of clinker as coal or oil," "[u]sing coal instead of natural gas results in lower uncontrolled NO_x emissions").

¹³ See, e.g., CSCME, "Comments Related to the Risk of Leakage in the Cement Sector," March 10, 2016, at 4.

¹⁴ Scoping Plan Update at 45-46.

critical to protecting the natural environment and keeping it available for current and future generations. 15

Finally, CARB also acknowledges the cement industry's unique constraints in achieving further emissions reductions when it states, "policies and measures to supply cleaner fuels and more efficient technology are the key to reducing GHG emissions. Some sectors, such as cement and glass, also have significant process emissions, and there may be fewer opportunities to address those process emissions, as they are related to chemical reactions and processes to meet safety, product-specific, or regulatory standards for the final products." ¹⁶

112-1 cont.

In short, due to significant and unique policy and technological constraints, withholding allowances from the cement industry to incentivize fuel switching or the adoption of certain energy efficiency technologies would have the opposite of CARB's intended effect and would result in systematic disinvestment and leakage.

3. Any Additional Regulations To Reduce GHG Co-Pollutants Will Unduly Burden, And Increase The Risk Of Leakage In, The Cement Industry

In the Scoping Plan Update, CARB also highlights recommendations to pursue more facility-specific GHG reduction measures to achieve potential local air quality co-benefits. ¹⁷ Such an approach is misguided. Because the California cement industry is already subject to onerous direct regulations intended to control and reduce direct emissions of criteria and toxic air pollutants, any additional measures would be duplicative and less effective.

The Scoping Plan Update also mentions that "[r]educing allocation if the covered entity increases criteria or toxics emissions over some baseline" will be another potential change to evaluate in support of greater direct GHG emissions reductions. ¹⁸ California, however, already regulates toxic pollutants under other legal regimes, as noted in the Scoping Plan Update:

The State has a long history of addressing health-based air pollutants in this sector. Many of the actions for addressing criteria pollutants and toxic air contaminants in the industrial sector are driven by California's local air district stationary source requirements to ensure progress toward achieving State and national ambient air quality standards.¹⁹

¹⁵ Id. at 94.

¹⁶ Id. at 93 (emphasis added).

¹⁷ Id. at 96.

¹⁸ Id. at 40.

¹⁹ Id. at 94.

Moreover, CARB expressly recognizes that "GHG, criteria pollutant, and toxic air contaminant trends are not always correlated." The introduction of such a "baseline" calculation into the allocation framework would lead to incoherent results, where a facility may be in compliance with California's legal requirements directly addressing these pollutants even if they are above any new and different "baseline" contemplated by the Scoping Plan Update. Such a measure would be inefficient, because it would attempt to address local pollutants through a program directed at global pollutants, and it would have significant unintended consequences, including unnecessary and duplicative costs and compliance difficulties for the California cement industry.

4. CARB Should Expressly Identify A BCA As A Necessary Additional Action To Minimize Leakage In The Cement Sector

In the Scoping Plan Update, CARB lists several "Potential Additional Actions" that it could take to complement its existing measures and policies and further reduce GHG emissions. CARB anticipates "that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions. The potential additional actions include the following: "[e]valuate and design additional mechanisms to further minimize emissions leakage in the Cap-and-Trade Program."

When considering additional actions, CSCME urges CARB to establish a BCA to minimize leakage in the cement sector. In December 2010, CARB directed its staff to consider a border adjustment for cement to address the additional risk of leakage associated with the existing allowance allocation approach.²⁴ Unfortunately, CARB has not developed a BCA to address the increasing risk of leakage to the California cement industry and is now proposing fundamental changes to the allowance allocation framework.

A well-designed and adequate allowance allocation framework has the potential to minimize both the risk of leakage relative to imported cement (*i.e.*, intra-industry leakage) and relative to imported substitutes for concrete, such as asphalt or steel (*i.e.*, inter-industry leakage). Even if the cement industry is assigned the highest assistance factor possible, however, the risk of both intra-industry and inter-industry leakage will rise as the cap adjustment factor declines over time. Given this feature of the program, an incremental BCA has the potential to minimize the risk of intra-industry leakage by placing a similar "net" compliance obligation on imported cement (*i.e.*, importers incur an obligation for any GHG emissions that exceed the allowance allocation rate for California producers). In short, an incremental BCA can serve as an important and necessary complement to the allowance allocation framework, especially in the context of a rapidly declining cap adjustment factor and, therefore, allocation rate.

²⁰ Scoping Plan Update at 96.

²¹ Id.

²² Id.

²³ Id. at 97.

²⁴ CARB Resolution 10-42, December 16, 2010.

In order to prevent emissions leakage and achieve California's climate change objectives, all cement sold in California should face comparable compliance obligations under AB 32. Implementation of an effective BCA for cement is instrumental in achieving this goal, and CARB should <u>explicitly</u> identify a BCA as a potential additional action to minimize leakage in the cement sector.

CSCME Supports The Removal Of Artificial Barriers To Further GHG Emissions Reduction In The Cement Industry

In addition to considering a BCA, CSCME recommends that CARB remove artificial barriers to further GHG emissions reductions in the cement industry, including but not limited to barriers regarding limestone blending and the use of alternative fuels. As mentioned above, the California cement industry has an exceptionally low ability to reduce its GHG intensity largely due to the fact that more than half of the industry's GHG footprint is associated with process emissions. This is further compounded by the fact that existing plants already utilize the most advanced and energy efficient production technology and are constrained in their ability to substitute lower carbon fuels in the future due to market, technical, and regulatory barriers. Reducing these barriers would allow for additional GHG emissions reduction in the industry.

Artificial barriers in limestone blending are particularly problematic for the cement industry. In other countries, cement and concrete codes and standards permit a higher percentage of limestone blending, which decreases the GHG emissions per ton of cement by the corresponding increase in the percentage of limestone. In California, however, as a result of differing codes and standards, the commercial reality is that blending of limestone is limited to 5 percent. Like these other countries, California state agencies and local governments should recognize that a higher limestone blending percentage (up to 15 percent) can be used for a wide variety of cement and concrete end-uses and should implement/harmonize standards and codes that permit such higher blending in appropriate applications.

In addition, reducing the barriers associated with alternative fuels could allow the cement industry to further reduce its emissions. In California and the United States more generally, the vast majority of cement kilns currently use either coal or petroleum coke as the primary fuel. In theory, California cement manufacturers could use a wide range of alternative fuels to reduce their GHG emissions, such as engineered municipal solid waste. However, engineered municipal solid waste faces its own barrier due to regulatory limits on how much of the fuel can be used. In addition, negative public perceptions associated with the use of solid waste and other alternative fuels often cause problems during the permitting process.

Given the cement industry's high level of process emissions and already advanced energy efficient production technology, the removal of the industry's artificial barriers is crucial to further reductions in GHG emissions in the cement sector.

III. CSCME ENCOURAGES CARB TO ENGAGE STAKEHOLDERS IN FUTURE STUDIES

The Scoping Plan Update mentions that an "economic analysis will be revised prior to the final release of the 2030 Target Scoping Plan to include additional analyses including a regional impact analysis to estimate the distribution of economic impacts across regions of the State, including disadvantaged communities."²⁵ The Scoping Plan Update also mentions multiple studies underway to assess the impact of California's climate change policy and AB 32, including "three research contracts underway at CARB to quantify the impact of California's climate policy on regions and disadvantaged communities throughout California," "researchers from UCLA [who] are estimating the improvements in health outcomes associated with AB 32," and "two studies currently underway to quantify the impact" of the Greenhouse Gas Reduction Fund.²⁶

Given the importance of understanding the impact of cap-and-trade and the proposed allocation framework, CSCME encourages CARB to: (1) engage industry stakeholders early in the process to ensure that the studies are utilizing the best data available and reflect the unique circumstances of each industry and (2) provide stakeholders with sufficient time to review and comment on the studies.

* * * * *

CSCME looks forward to continuing to work with CARB to achieve California's climate change objectives while minimizing leakage in the cement sector so that California cement manufacturers can continue to be valuable contributors to climate change solutions.

Sincerely yours,

Chairman, Executive Committee, Coalition for Sustainable Cement Manufacturing & Environment

CC: Steven Cliff, California Air Resources Board Richard Corey, California Air Resources Board Rajinder Sahota, California Air Resources Board Jason Gray, California Air Resources Board Mary Jane Coombs, California Air Resources Board Derek Nixon, California Air Resources Board

10

30251279

²⁵ Scoping Plan Update at 75.

²⁶ Id. at 75-76.

Impact of Alternative Scenario: Why CARB's Proposed Framework Fails to Minimize Leakage in the Cement Industry

What does the proposed framework mean in terms of decreases to the California cement industry's allowance allocation rate?

- CARB is proposing to decrease the cement industry's assistance factor (AF) from 1.00 to 0.74.
- When this AF is combined with the existing benchmark and a cap adjustment factor consistent
 with the proposed regulation, the cement industry's allocation rate will <u>precipitously decline</u>
 from 0.757 allowances per metric ton of cement in 2020 to 0.550 in 2021.
- The allocation rate will continue to decline until 2030, reaching 0.457 allowances per metric ton a level that is significantly below the process emissions wall.

How will this decrease in the allocation rate affect the California cement industry's "uncovered" carbon costs?

- For the sake of illustrating the potential impacts of the proposed framework, we assume the following conditions exist in 2026 (i.e., the midpoint of the post-2020 timeframe):
 - o The prevailing carbon price will increase to \$20.00, which is an ultra-conservative assumption given that CARB expects the auction reserve price to be \$20.70 in that year.
 - o The cement industry's allocation rate declines to 0.498, as implied by the current proposal.
 - The cement industry's average GHG intensity decline to 0.80 metric tons of GHG per metric ton of cement (i.e., appreciably below the industry "best performer" prior to the start of the program).
- Under these assumptions, approximately 62% of the cement industry's carbon costs will be offset by allowance allocation and the remaining 38% will remain "uncovered."
- This suggests that, given a carbon price of \$20, the cement industry's net exposure will be \$7.55 per metric ton of cement.

What will happen if the California cement industry attempts to pass through these "uncovered" carbon costs to consumers?

- According to the leakage studies commissioned by CARB and used as the basis for the
 proposed allowance allocation framework, each \$1.00 in uncovered compliance costs per unit
 of output will reduce California cement production between 8.4% and 10.5%.¹
- Therefore, even under an ultra-conservative carbon price assumption, the studies suggest
 that the California cement industry will experience a 63% to 79% decline in output if it
 attempts to pass through \$7.55 in uncovered compliance costs to customers a decline that
 would easily exceed the historic downturn in the cement industry during the Great Recession.

¹ See Table 1 for detailed calculations.

How does such a swift and severe decline in domestic output not result in leakage?

- Neither CARB staff nor the commissioned studies offer a clear rationale for how this reduction in domestic production does not result in severe emissions leakage.
- The domestic leakage study does not attempt to estimate the proportion of lost domestic production that is offset by an increase in output in other U.S. state.
- The international leakage study attempts to estimate the portion of the lost domestic production that will be offset by an increase in international output using a post-hoc calculation (i.e., the "international market transfer rate"). In the case of the California cement industry, the IMT suggests that only a small fraction (4%) of the production decline will be offset by an increase in international output. The study offers no logical explanation as to what happens to the other 96% of the production decline (i.e. how will California's demand for cement be met if not by out-of-state producers?).

112-2

What does all of this mean in terms of global GHG emissions?

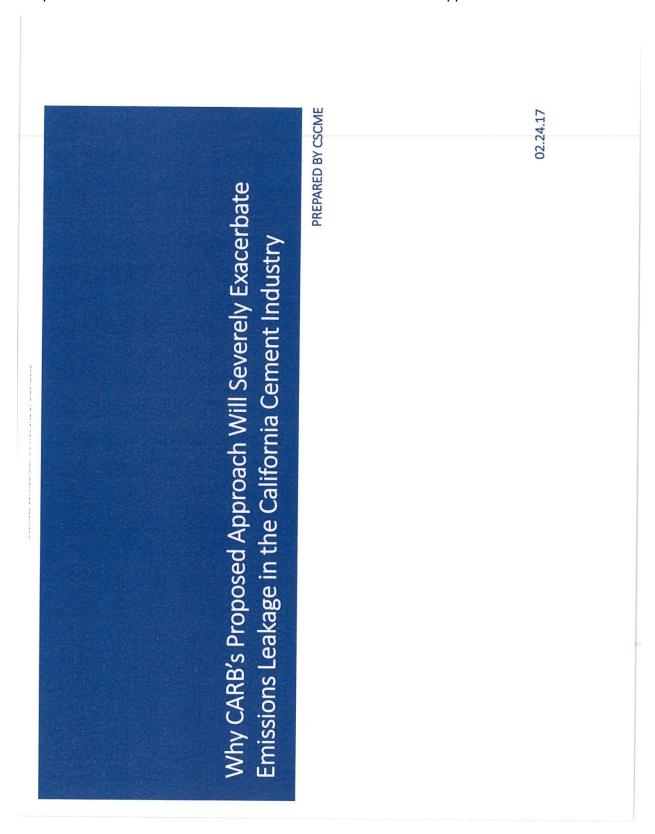
- It is unclear. Neither CARB staff nor the commissioned studies offer clear guidance on the potential impact on global GHG emissions.
- Neither study estimates the GHG intensity of imported product, including the increased GHG
 emissions associated with transporting imported product to the California market. CARB staff
 has not offered any analysis to fill this critical gap.
- As a result, <u>CARB</u> is incapable of establishing that the proposed AFs minimize leakage or, alternatively, that reducing the AF for the California cement industry will result in a global GHG benefit.

How should CARB proceed?

- CARB should take the time to <u>conduct a careful and critical evaluation of its proposed</u>
 <u>allowance allocation framework</u>, including the practical impact (e.g., output loss) on the
 California cement industry due to adjustments to benchmarks, assistance factors, and CAFs.
- CARB should <u>not reduce the cement industry's AF</u> because there is no credible evidence that a
 lower allocation rate is consistent with the requirement to minimize leakage, because the
 evidence on which CARB does rely unequivocally demonstrates that significant leakage will
 occur under its proposed framework, and because the decline in the statewide emissions cap
 will ensure that California meets its GHG reduction goals (regardless of allowance allocation).
- To the extent that CARB adopts an AF of less than 1.0 for the cement industry, it should also
 adopt an incremental border adjustment that imposes comparable requirements on cement
 importers, which is the only approach to ensure the minimization of leakage in the absence of
 100% allowance allocations.

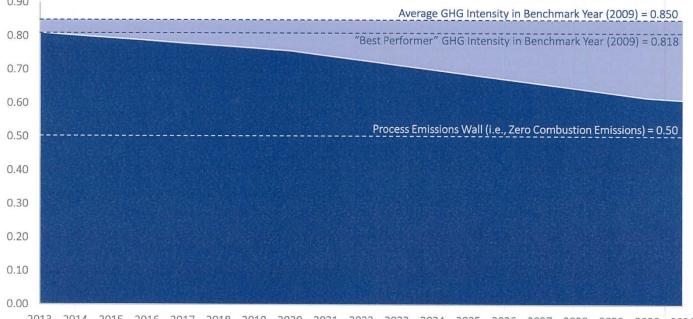
Table 1. Proposed Framework: Estimated Output Declines

Metric	Dom. Study	Int'l. Study
Estimated Output Decline from Combustion Emissions (Per the Leakage Studies)	20.5%	33.0%
Carbon Price Assumption (Per the Leakage Studies)	\$24.88	\$10.00
Process Emission Share Assumption (Per CARB's MRR Data, as Reported in Table 1 of Attachment B)	60.7%	60.7%
Estimated Output Decline per \$1 of Uncovered Carbon Costs (Combustion + Process Emissions)	2.1%	8.4%
Uncovered Carbon Costs @ \$20 Carbon Price in 2026 (Per Prior Slide)	\$7.55	\$7.55
Estimated Output Decline Under Proposed Framework	15.8%	63.4%
Output Decline if Factors are Non-Additive	63.4%	
Output Decline if Factors are Additive	79.2%	



Under a "status quo" scenario, the cement industry's allocation rate would decline to 0.62 allowances per MT of cement by 2030.





Note: The status quo scenario assumes that the benchmark and assistance factor remain unchanged but the cap adjustment factor is modified to be consistent with the more aggressive decline in the overall program cap (see Table 9-2 of the proposed modifications).

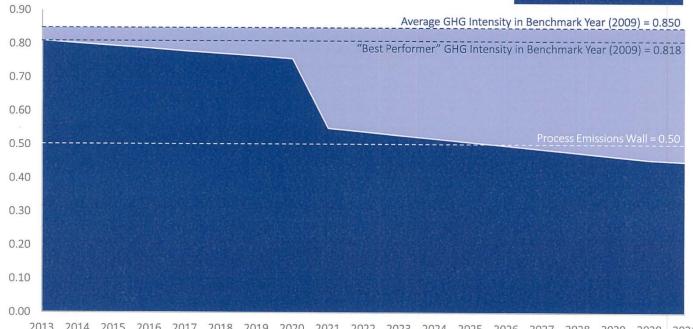
Source: CARB (Mar 2011). Final Regulation Order. Pg. 145 & Pg. 161; CARB (2016). Proposed Amendments, Attachment A. Pg. 214.

Under CARB's <u>proposed</u> framework, the industry's allocation rate would decline to 0.46 allowances per MT of cement — well below the "process emissions wall."





Uncovered Obligations

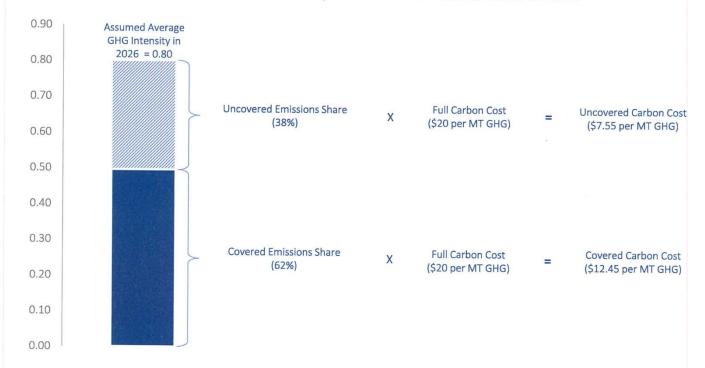


Note: The status quo scenario assumes that the benchmark and assistance factor remain unchanged but the cap adjustment factor is modified to be consistent with the more aggressive decline in the overall program cap (see Table 9-2 of the proposed modifications).

Source: CARB (Mar 2011). Final Regulation Order. Pg. 145 & Pg. 161; CARB (2016). Proposed Amendments, Attachment A. Pg. 214.

Given conservative assumptions, the cement industry will face an "uncovered carbon cost" of \$7.55 per MT of GHG in 2026 under the proposed framework.

Proposed Framework: The Cement Industry's "Uncovered" Carbon Costs in 2026



Note: The calculation assumes that in 2026 (midpoint of post-2020 timeframe) there is a prevailing carbon price of \$20, the industry's allocation rate is 0.498, and the cement industry's average GHG intensity is 0.80 metric tons of GHG per metric of cement.

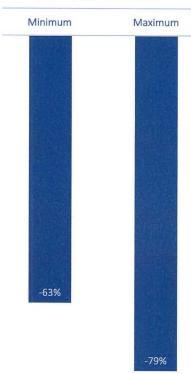
Source: CARB (2011) Final Regulation Order; CARB (2016), "Post-2020 Industry Assistance Factor Calculations."

The leakage studies suggest that passing through an uncovered carbon cost of just \$7.55 to customers will result in a 63% to 79% decline in industry output.

Proposed Framework: Estimated Output Declines

Metric	Domestic Study	Int'l Study
Estimated Output Decline from Combustion Emissions (Per the Leakage Studies)	20.5%	33.0%
Carbon Price Assumption (Per the Leakage Studies)	\$24.88	\$10.00
Process Emission Share Assumption (Per CARB's MRR Data, as Reported in Table 1 of Attachment B)	60.7%	60.7%
Estimated Output Decline per \$1 of Uncovered Carbon Costs (Combustion + Process Emissions)	2.1%	8.4%
Uncovered Carbon Costs @ \$20 Carbon Price in 2026 (Per Prior Slide)	\$7.55	\$7.55
Estimated Output Decline Under Proposed Framework	15.8%	63.4%
Output Decline if Factors are Non-Additive	63.4%	
Output Decline if Factors are Additive	79.2%	



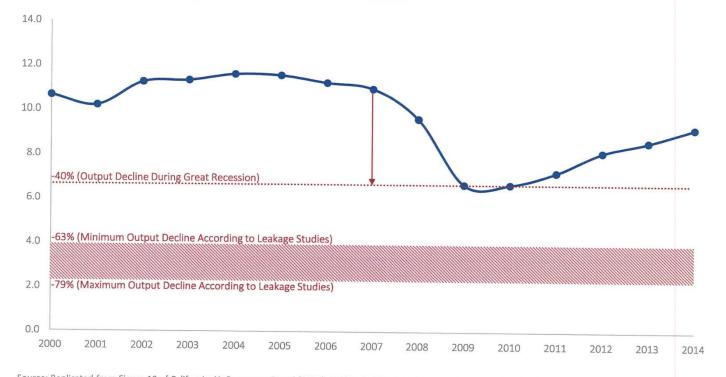


Source: CARB (2016), "Post-2020 Industry Assistance Factor Calculations"; Fowlie et al. (2016), "Market Based Emissions Regulation and Industry Dynamics"; Resources for the Future (2016), "Employment and Output Leakage under California's Cap-and-Trade-Program."

To put this scenario into perspective, such an output decline would far exceed the cement industry's unprecedented downturn during the Great Recession.

Proposed Framework: Estimated Output Declines in Context

California Cement Industry Output, Million Tons of Clinker Produced

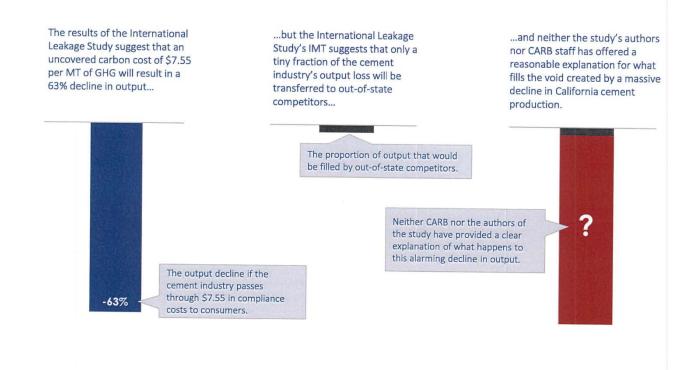


Source: Replicated from Figure 13 of California Air Resources Board (2016). California GHG Emissions Inventory. Page 7; 2014 data taken from U.S. Geological Survey, Mineral Industry Surveys.

Neither CARB nor the studies offer a clear explanation for how such a reduction in output will not result in severe injury and irreversible emissions leakage.

Why CARB's Proposed Framework Lacks Credibility

California Cement Industry Output, Millions Tons of Clinker Produced



Additionally, there are several reasons to believe that the studies systematically <u>underestimate</u> the risk of economic and emissions leakage under AB 32.

1 Process Emissions

The leakage studies explicitly do not model the impact of process emissions, and CARB's adjustments for process emissions do not address the original output metrics. As a result, the estimated output decline and risk of emissions leakage for process emissions-intensive industries are likely to be significantly understated.

2 Inter-Industry Leakage

Neither leakage study evaluates the potential for shifts in production to different out-of-state industries (e.g., California cement production shifts to out-of-state asphalt). To the extent that this occurs and that these substitute products are transported to California for consumption, the modeling results are likely to understate to risk of emissions leakage.

Emissions Intensity
Differentials

Neither study takes the final step of translating estimates of "production leakage" into "emissions leakage". Given that most products manufactured in California are likely to have a lower emissions footprint and require less transportation than those produced outside, emissions leakage is likely to be significantly higher than production leakage.

Other Costs Associated with AB 32

The leakage studies only consider the direct compliance costs associated with the capand-trade program when estimating output impacts. In reality, AB 32 imposes a range of other costs on industries — including the RPS, LCFS, administrative fees, and compliance activities. These costs will increase the financial burden associated with AB 32, increasing the potential for output decline and the risk of emission leakage.

How should CARB proceed?

High Priority Recommendations

- CARB should take the time to <u>conduct a careful and critical evaluation of its proposed allowance</u> <u>allocation framework</u>, including the practical impact (e.g., output loss) on California industries due to adjustments to benchmarks, assistance factors, and cap adjustment factors.
- CARB should <u>not reduce the cement industry's AF</u> because there is no credible evidence that a lower allocation rate is consistent with the requirement to minimize leakage, because the evidence on which CARB does rely unequivocally demonstrates that significant leakage will occur under its proposed framework, and because the decline in the statewide emissions cap will ensure that California meets its GHG reduction goals (regardless of allowance allocation).
- To the extent that CARB adopts an AF of less than 1.0 for the cement industry, it should also <u>adopt</u> an incremental border adjustment that imposes comparable requirements on cement importers, which is the only method to ensure the minimization of leakage in the absence of 100% allowance allocation.



Letter 121

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

April 10, 2017

Submitted electronically

RE: EDF Comments on Proposed Scoping Plan for Achieving 2030 Target

Table of Contents

Introduction	2
EDF Supports Adoption of the Proposed 2030 Scoping Plan	2
EDF believes a cap-and-trade program is an essential part of a post-2020 scoping plan	3
EDF supports scoping plan measures that will fast track reductions of both GHGs and local pollutants that impact health	4
Comments on Electricity Sector Reduction Policies and Strategies	5
Introduction to electricity sector comments	5
Impacts of a higher Renewables Portfolio Standard	7
Treatment of DR and flexible loads	8
The scoping plan should more robustly consider the role of conventional DR	10
Expectations from cost-effective flexible loads	. 11
Accounting for the capabilities of EVs and storage	. 12
Coordination with key California Public Utilities Commission proceedings	13
Table 1: LBNL Identified Demand Response Resources	16
Introduction to oil and gas comments	
The Scoping Plan must include a comprehensive discussion and approach to the oil and gas sector and move away from the piecemeal approach that currently exists across multiple agend initiatives	cies
Emissions reduction efforts should be based in part on social cost evaluations that include the social cost of methane and nitrous oxides	18
Updating the state's greenhouse gas facility emissions rates based on the best science around methane will create new opportunities to ensure emitters are accountable for the full amount of their emissions	

1107 9th Street Suite 1070 Sacramento, CA 95814 T 916 492 7070

F 916 441 3142

edf.org

New York, NY / Austin, TX / Bentonville, AR / Boston, MA / Boulder, CO / Raleigh, NC Sacramento, CA / San Francisco, CA / Washington, DC / Beijing, China / La Paz, Mexico Totally chlorine free 100% post-consumer recycled paper

Introduction

Thank you for this opportunity to comment on the Proposed 2030 Scoping Plan Update. We appreciate the hard work of staff and the board that has gone into this process and that will continue as a Scoping Plan Update is adopted and implemented. EDF is committed to promoting science-based solutions to address climate change and bring greenhouse gas emissions to 40% below 1990 levels by 2030. California has made good faith efforts to try to fight dangerous emissions that impact our climate, and we commend the California Air Resources Board (CARB) for moving toward greater efforts in addressing climate warming and air quality impacts in its latest Scoping Plan update.

Supporting California's climate policies is an important organizational priority for EDF. California is providing a critical example to the global community of how to implement ambitious climate policies while balancing important policy priorities including economic prosperity, health, jobs, strong communities, and a clean environment. The Scoping Plan is an essential blue print for this important effort. California is setting a world standard for best practice through this process which has experienced important improvements and change since the initial Scoping Plan Process in 2008. EDF is particularly encouraged to see a commitment to increased outreach and public engagement with environmental justice communities, further incorporation of health considerations and local air quality issues in this Proposed Scoping Plan, and an even more rigorous engagement with expert agencies across California.

EDF Supports Adoption of the Proposed 2030 Scoping Plan

Staff Lead: Erica Morehouse

Below are comments on areas of this Proposed Scoping Plan in which EDF has particular interest and expertise. Overall, EDF supports adoption of the Proposed Scoping Plan. Our comments reflect suggestions that are consistent with the general proposed direction of the Scoping Plan. These comments also identify areas which we believe could benefit from refinement before the final adoption, areas we hope to work closely on, or where we would like

to see staff pay particular attention during implementation of this Scoping Plan Update.

EDF believes a cap-and-trade program is an essential part of a post-2020 scoping plan

EDF believes that a state-wide, post-2020 cap-and-trade program is an essential component of California's 2030 Scoping Plan. The cap-and-trade program places an absolute limit on carbon pollution and ensures California does not exceed the carbon budget it has set for itself while also providing some flexibility in meeting those requirements. This backstop is an essential companion to other Scoping Plan policies because it provides reduction certainty and ensures that Californians do not have to choose between ambitious climate action and a thriving economy.

Extending Cap and Trade in California sets the state up to continue as one of the foremost global leaders on climate action. Carbon pricing is gaining momentum globally and California's program has been a model for global action. Continuing Cap and Trade will send an important message to other global actors that ambitious climate action is workable. The cap-and-trade framework also provides more direct opportunities for cooperation through international linkages like the one California already has with Quebec. Ontario is on track to link their new cap-and-trade program to California and Quebec's in early 2018, showing the power of subnational leadership and the viability of California and Quebec's model. Others like Mexico and the state of Oregon are actively considering climate policy proposals including ones that might provide direct linkage opportunities with California. EDF strongly supports keeping the pathway open to these linkages and partnerships, including those that focus primarily on information sharing and best practices and contribute to medium- and long-term amplification of California's climate ambition globally.

Similarly, Cap and Trade provides an important opportunity for California to provide leadership in driving global carbon reductions through linkages such as sectoral offsets. EDF believes that California's role in discouraging deforestation and forest degradation in places like Brazil is critical for ensuring that forests are worth more alive than dead, and that programs to protect forests benefit the communities who depend on, manage, and defend them. EDF continues to support a linkage with Acre, Brazil, to accept sectoral forest credits during the third capand-trade compliance period.

Carbon pricing facilitated by Cap and Trade is most effective as a long-term signal that incentivizes emissions reductions, technology adoption, and innovation by internalizing the cost of emissions for polluters. Even switching to another form of carbon pricing like a carbon tax mid-stream would be disruptive. Many regulated businesses must make investment decision on multi-year time horizons and policy certainty and consistency is essential to encouraging and rewarding responsible climate action. Cap and Trade provides flexibility for those regulated so that the lowest-cost emissions reductions can be achieved first and regulators are not forced to dictate emission reduction strategies for sectors where the best path to reductions is uncertain.

The long-term economic signal created by the cap-and-trade market also provides an opportunity to incentivize reductions from difficult to regulate sectors like natural and working lands through the offsets program. Offsets also provide what we believe will be an

increasingly important cost-containment function as California work to achieve a much more ambitious 2030 target, all while maintaining the highest standards for achieving real, permanent, and verifiable GHG reductions.

EDF believes that the cap-and-trade program can work effectively with a suite of other climate and air quality policies that move California toward the cleaner, healthier, lower carbon economy Californians need.

EDF supports scoping plan measures that will fast track reductions of both GHGs and local pollutants that impact health

Despite decades of hard work by CARB and others and significant progress, local air pollution remains a serious threat to public health in many parts of California. It is low-income neighborhoods and communities of color that are often most impacted by poor air quality. To achieve greater environmental equity we must be constantly vigilant for opportunities to clean up our most impacted neighborhoods and air basins. EDF recognizes that many, but not all, reductions of GHGs could lead to corresponding reductions in local and toxic air pollutants. Because of this close but not one-to-one relationship between GHG pollutants and local or toxic air pollutants, it is important to consider the impact of pollutants beyond GHGs within the Scoping Plan process and we appreciate the efforts by our environmental justice colleagues to bring this conversation into sharper focus. EDF also encourages CARB to fully and expeditiously implement the Adaptive Management Plan to address localized adverse air quality impacts.

EDF supports policies that can make direct and effective progress towards reducing harmful local pollution. One important example is EDF's close partnership with ARB in implementing, defending, and exporting California's pioneering clean car and clean truck standards. This Scoping Plan places an important focus on the transportation sector, the largest source of California's GHG emissions, and a sector that has an outsized impact on local health as well.

We do recognize that stationary sources are an area of particular concern for environmental justice communities as well. We believe CARB's proposed refinery measures represent a strong starting point for a measure aimed at driving faster GHG reductions that could also contribute critical public-health co-benefits for communities. The study released by OEHHA on the impacts of the cap-and-trade program identified the refinery sector as having one of the closest links between GHGs emitted and local and toxic air pollutants. By benchmarking requirements to the best-in-sector performance, ARB is ensuring that feasible progress is achieved. While measures that can reduce both GHG and local toxic air pollutants are ideal, we also believe California should explore measures that will independently accelerate the reductions of local and toxic pollutants where possible.

An important finding of the OEHHA study was that there are data gaps that hamper a full understanding of the connection between GHG emissions and other pollutants. We urge CARB and will urge other decision makers to work towards meeting the recommendations for

121-1

¹ Office of Environmental Health Hazard Assessment, Benefits and Impacts of Greenhouse Gas Limits on Disadvantaged Communities (February 2, 2017) https://oehha.ca.gov/environmental-justice/report/ab32-benefits

data collections proposed by OEHHA. EDF also believes that further progress on data collection and transparency beyond even what OEHHA recommended is possible, this could include steps such as updating the Mandatory Reporting Requirement to include reference to other disclosures so that comparison can be made between MRR and other relevant emissions data sets such as local and toxic air contaminants. Additionally, new data collection and monitoring methods are becoming increasingly available. For example, EDF has been working in partnership with Google to use mobile monitoring techniques to measure methane leaks. We believe these next generation methodologies could provide critical access to data that Californians need to protect their communities and decision makers need to do their jobs. We look forward to working with ARB and others towards exploring these new opportunities in this new context.

Comments on Electricity Sector Reduction Policies and Strategies

Staff leads: Jayant Kairam, James Fine, Andy Bilich, and Larissa Koehler

Introduction to electricity sector comments

EDF applauds the California Air Resources Board (CARB) for their forward and expansive thinking presented in its strategy regarding low carbon energy. The Proposed Scoping Plan Update (Scoping Plan) rightfully points out the nation-leading progress the state has made in ensuring that the electricity sector stays on track to meet the greenhouse gas (GHG) reduction commitments articulated in Assembly Bill (AB) 32.

In all scenarios considered in the Scoping Plan, reductions from the electricity sector are assumed to meet or come close to those mandated under existing law. Per the Scoping Plan, the electricity sector (which encompasses in-state generation and imports) accounts for 20% of overall emissions. This is despite steady declines in electricity sector emissions like the Renewable Portfolio Standard - indeed, California is ahead of schedule in meeting the original 2020 target, with 25% of retail sales served by renewable energy in 2016.³ This is a strong foundation to build upon, especially given Senate Bill (SB) 32's recently enacted goal of reducing GHG emissions 40 percent relative to 1990 levels. It is clear that the Scoping Plan recognizes that achieving the 2030 - and presumably the 2050 targets - hinges on the electricity sector's compliance with multiple clean energy targets. CARB's expectations for the rate of emission reductions from electricity between 1990 to 2030 are the most substantial of any sector evaluated on a percentage basis. However, overreliance on any single policy solution and/or poor coordination between complementary reduction strategies may not result in maximum benefits – raising the question of whether it will be possible to achieve needed GHG emissions reductions while keeping costs low. Accordingly, the most appropriate approach is an "all hands on deck" strategy that reliably and affordably integrates utility-scale investments alongside smaller, more flexible demand-side resources.

² California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target* at 41 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/2030sp pp final.pdf.

³ 2016 GHG Emissions Inventory Report

⁴ California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target* at 55 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/2030sp-pp-final.pdf.

As the composition of California's electric grid rapidly transforms, it is critical to take a holistic view toward the policy and resource opportunities and challenges. Foremost among these considerations is the dependence on natural gas to serve a grid reliability function, due to the proliferation of intermittent renewable resources making up greater portions of the resource mix. Even though California has some of the most stringent regulation over the oil and gas sector and methane emissions reduction in the country, they still emit dangerous pollutants in significant quantities, and the state remains heavily dependent on them for in-state net electricity generation and imported resources. As clearly evidenced by the Aliso Canyon pipeline leak, the state's significant gas resources can have debilitating environmental and public health impacts if not regulated, retrofitted and monitored effectively. Thus, rather than put misplaced and potentially increased reliance on these fossil fuel resources, it is critical to ensure the procurement of resources that can integrate excess renewable energy onto the system, reduce wasteful curtailment, and shift demand to times when energy is less expensive and cleaner. Prioritizing and fully valuing energy storage and cost-effective, load-modifying resources like demand response (DR) and time-of-use (TOU) electricity rates will be an important complement to reforms designed to facilitate greater transparency into wholesale gas markets that will allow non-fossil resources to provide reserve capacities, load balancing, and other ancillary services.

Additionally, as we have seen with the drop in the costs in solar photovoltaics (PV) over the last ten years, the rise of a particular technology in the market can be a monumental force in reshaping electricity planning. Opportunities to integrate clean, low-cost distributed energy resources (DERs) will only grow and facilitate the achievement of GHG targets that are possible with a higher RPS. DERs are estimated to have the potential to dramatically increase the utilization of renewable generation capacity, avoid GHG emissions from natural gas generation used to provide system "ramps," and significantly reduce system costs.

Yet, we need to acknowledge that the current incentive systems for the state's primary IOUs is leading to perverse outcomes that limit the optimization of such DERs. As recognized by the California Public Utilities Commission (CPUC) in the Integrated Distributed Energy Resources (IDER) proceeding, "if we hope to create a truly successful model for future distribution infrastructure planning and DER deployment, we cannot reasonably proceed without

⁵ U.S. Energy Information Administration, California: State Profile and Energy Estimates, https://www.eia.gov/state/analysis.php?sid=CA#58.

⁶ Amanda Johnson, CA Utilities Are Leaking Lots of Gas - but There's a Way to Stop It, Environmental Defense Fund (Mar. 1, 2017), http://blogs.edf.org/energyexchange/2017/03/01/report-ca-utilities-are-leaking-lots-of-gas-but-theres-a-way-to-stop-it/.

⁷ These reforms are further articulated in the Methane, Oil & Gas Operations section of EDF's Scoping Plan comments.

Eazard's Levelized Cost of Energy Analysis – Version 10.0 (Dec. 2016), https://www.lazard.com/media/438038/levelized-cost-of-energy-v100.pdf;

⁹ See, e.g., Trieu Mai, et al., A Prospective Analysis of the Costs, Benefits, and Impacts of U.S. Renewable Portfolio Standards, National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory at 18 (2016), https://eta.lbl.gov/sites/all/files/publications/lbnl-1006962.pdf.

¹⁰ See, e.g., Ryan Wiser, et al., A Retrospective Analysis of the Costs, Benefits, and Impacts of U.S. Renewable Portfolio Standards, National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory at 17 (2016), https://eta.lbl.gov/sites/all/files/publications/lbnl-1003961.pdf.

acknowledging and attempting to address the conflict between the Commission's policy objectives and the utilities' financial imperatives." 11 To that end, EDF supports exploring revision of the business model as a way to better align utility interests with use of more DERs, including a system in which revenue is contingent on meeting pre-determined performance metrics and a "fees for services" model in which, for example, utilities receive payment for connecting their customers to DER providers. CARB would do well to recognize what the CPUC already has - that it is not a given that IOUs will optimize DERs under the current business model.

Finally, CARB has rightfully recognized cross-sectoral opportunities that exist between the electricity sector and the lead emitting sector, transportation. It will be imperative to continue to emphasize and expand opportunities for demand-side management strategies like "smart" EV charging designed to utilize excess renewable energy, and vehicle to grid (V2G) integration, especially as those technologies are further developed and become more prolific.

Creating a grid that fairly values increasingly available DERs and integrates growing amounts of renewable energy have been guiding principles for energy policy in the state for some time. 12 However, relative to the 2020 targets, the pathway to 2030 is considerably more challenging. The Scoping Plan should reinforce these principles and contemplate an "all hands on deck" approach – as they will be imperative to meeting SB 32 targets.

Impacts of a higher Renewables Portfolio Standard

The "Proposed Scoping Plan Scenario" assumes a Renewables Portfolio Standard (RPS) of 50% by 2030, increasing to 80% by 2050, while the "Alternative Scenario 1" assumes a 60% RPS by 2030, increasing to 80% by 2050¹³). These measures, coupled with current legislation proposing a 100% RPS for California by 2045, 14 highlight the need to more closely analyze an increasing RPS as an instrument for reducing GHG emissions and the costs associated with a higher penetration of renewables on the grid.

There is no doubt that the historical success of the RPS in California driving electricity markets towards low-carbon energy solutions, economic development and growth, and widespread environmental benefit needs to be recognized. 15

¹¹ Assigned Commissioner's Ruling Introducing a Draft Regulatory Incentives Proposal for Discussion and Comment, Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Distributed Energy Resources, R. 14-10-003 at 3 (filed Apr. 4, 2016).

12 Senate Bill 350 (De León, 2015),

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill id=201520160SB35; Assembly Bill 327 (Perea, 2013), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327.

13 California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The Proposed* Strategy for Achieving California's 2030 Greenhouse Gas Target - Appendix D: PATHWAYS Modeling at 12-13 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf. 14 Senate Bill 584 (De León 2017),

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB584.

⁵ Ryan Wiser, et al., A Retrospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards, Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory (Jan.

As we continue to move towards higher RPS targets, it will be important to simultaneously develop and utilize other potentially lower-cost solutions, particularly on the demand side, to ensure cost-effective mitigation of GHGs. With current renewable penetration, ¹⁶, CAISO is already planning curtailment of 6000-8000 megawatts of renewable energy this spring, while recent analysis suggests that overall negative net loads (i.e., "the belly of the duck") are arriving faster and lower than predicted, with less seasonal variation. ¹⁷ Demand-side solutions like dynamic pricing, DR, energy efficiency, electric vehicles (EVs), and energy storage need to be explored more fully to ensure that the environmental and grid benefits of renewable resources are maximized in a cost- effective manner. ¹⁸

Treatment of DR and flexible loads

EDF seeks to understand how CARB considered the potential of load-modifying DR in facilitating GHG reductions in the electricity sector. The comprehensive representation of load-modifying DR is important for the findings of the economic analysis, the potential for GHG reductions from the electricity sector, and in the transportation sector (specifically, the potential for demand flexibility from EVs). Additionally, there are interdependencies between marginal abatement costs and more broad consideration of DR and other DERS that may be important for the economic impact modeling, such as the extent of investment in new renewable generation capacity needed to meet the RPS.

Among other factors, the GHG benefits from DR resources depend on the levelized marginal system costs, the hours where the DR occurs, and the other resources in the grid system, however, it is important to holistically consider and model the impacts of all potential DR resources, particularly the indirect benefits achieved through supporting higher renewable penetration and resulting limitation of curtailment.

In the Scoping Plan, CARB considers two main types of DR:

1. Conventional DR (aka "load shedding" resources) and

2016) https://eta.lbl.gov/sites/all/files/publications/lbnl-1003961.pdf; Trieu Mai, et al., A Prospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards, Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory (Dec. 2016) https://eta.lbl.gov/sites/all/files/publications/lbnl-1006962.pdf.

¹⁶ Peter Maloney, CAISO notches record, serving 56.7% of demand with renewable energy in one day, Utility Dive (Mar. 28, 2017), http://www.utilitydive.com/news/caiso-notches-record-serving-567-of-demand-with-renewable-energy-in-one/439085/.

¹⁷ Chris Vlahoplus, et al., Revisiting the California Duck Curve: An Exploration of Its Existence, Impact, and Migration Potential at 3 (Oct. 2016), Scott Madden Consultants, http://www.scottmadden.com/wp-content/uploads/2016/10/Revisiting-the-Duck-

Curve Article.pdf; see also California Independent System Operator, Memorandum to Board of Governors (Feb. 09, 2017), https://www.caiso.com/Documents/CEOReport-Feb2017.pdf.

18 Gregory Brinkman, et al., Low Carbon Grid Study: Analysis of a 50% Emission Reduction in

California – Executive Summary at 5 (2016), National Renewable Energy Laboratory and Center for Energy Efficiency and Renewable Technologies, http://lowcarbongrid2030.org/wp-content/uploads/2016/01/1601_Low-Carbon-Grid-Study-Analysis-of-a-50-Emission-Reduction-in-CA-Executive-Summary.pdf (The study noted demand response resources, smart charging EVs, and aggressive storage penetration can help California can much higher levels of renewables curtailment, avoid nearly a \$1billion in increased operational costs, and capture greater GHG benefits).

Flexible load or "load shift" resources for residential and commercial electric water heating, space heating, air conditioning, and refrigeration on a smart TOU rate design

To effectively evaluate the treatment of DR resources in the Scoping Plan, it is important to highlight the various types and potential of DR resources identified in the Lawrence Berkeley National Laboratory (LBNL) Demand Response Potential Study conducted on behalf of the CPUC. ¹⁹ Coordination with this LBNL study is important for two reasons: (1) the study provides benchmarks under a more comprehensive variety of price and policy conditions for the capacity of California's "shed" and "shift" resources; and (2). The study describes the potential of two additional resources available to the state that CARB hasn't considered in its current Scoping Plan (a short summary of these resources is found in Table 1 at the end of this section).

More specifically, the LBNL study highlights "load-shaping" DR as a significant, low-cost resource. If 20% of customers adopted load-shaping DR in the form of TOU pricing, an additional~7,500 gigawatt hours (GWh) of electricity demand could be served by renewables (an increase in utility-scale renewable utilization from 88 to 98 percent). In so doing, EDF estimates that approximately eight million tons of carbon dioxide emissions can thereby be avoided, at a savings of \$700 million a year. Load following DR can provide up to 300 megawatts (MW) of cost-competitive resources under \$50/kilowatts (kW) per year. Given the potential of all of these resources to provide reductions in energy use and GHGs, as well as indirect benefits in supporting other clean energy/low-carbon solutions, it is important for CARB to consider additional scenarios that optimize all DR resources as a function of price and policy or else risk leaving potentially significant cost (and emissions) savings unused.

In addition to the above considerations, EDF has identified several questions and comments on the representation of demand response resources in the PATHWAYS modelling and Scoping Plan Update.

¹⁹ Peter Alstone, et al., 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report on Phase 2 Results (Mar 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698.

²⁰ Peter Alstone, et al., ²⁰¹⁵ California Demand Response Potential Study – Charting California's Demand Response Future: Final Draft Study Results at 64 (Nov 30, 2016), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451706

²¹ James Fine, Like Clockwork: California Utilities Should Embrace Clean Energy Solutions when Testing Time-of-Use Electricity Rates, Environmental Defense Fund (Jan. 5, 2017), http://blogs.edf.org/energyexchange/2017/01/05/like-clockwork-california-utilities-should-embrace-clean-energy-solutions-when-testing-time-of-use-electricity-rates/? ga=1.77061597.999488634.1490123880.

²² Peter Alstone, et al., 2025 California Demand Response Potential Study – Charting California's

²² Peter Alstone, et al., 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report on Phase 2 Results at 5-67 (Mar 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698; for further discussion of other types of demand resources identified by LBNL, please see Appendix A.

The scoping plan should more robustly consider the role of conventional DR

The Reference Scenario includes an increase of approximately 115 cumulative MW of conventional, load shedding DR through 2024, in addition to the approximately 2,000 MW of existing DR available in 2015. ²³

The Proposed Scoping Plan Scenario includes an increase of approximately 5,500 cumulative MW of conventional, load shedding DR by 2031, in addition to the approximately 2,000 MW of existing DR available in 2015.²⁴ This quantity is not an output of the modeling, but rather it is an input that reflects prior state goals to increase the availability of DR.

- The 5,500 MW of conventional shed is in the middle of the 2-10 GW range (at the \$200 price referent and dependent on technologies and scenarios) suggested by the DR potential study, but the 2031 target set by CARB is 6 years after the LBNL target of 2025²⁵). Therefore, EDF recommends that additional iterations consider a best case scenario for DR in which the high end of the range of shed and shift DR can be achieved cost-effectively.
- As discussed below in the context of flexible load, it is not clear what the price context is for DR. Are the DR goals assuming a TOU price regime like the flexible load or do they assume existing tiered rates? Understanding the prices assumed for DR is important for benchmarking the DR goals with DR potential highlighted in the LBNL DR Potential Study. The LBNL study demonstrates that DR capacity varies significantly as a function of multiple factors notably electricity prices, the level of adoption of TOU rates, and the presence of DERs on the system.²⁷ It will be similarly important for CARB to allow for the Scoping Plan to represent a range of conventional DR resources.
- The Reference Scenario is modelled to reflect "current programs" through 2024, but the types of DR and the assumptions on growth, learning curves, price regimes, and efficiency to reach the Proposed Scenario's 2031 goal are not clearly laid out. It is also unclear if the Proposed Scenario includes any additional growth on top of the 115 MW included in the Reference Scenario for the 2018-2024 period.

²³ California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target – Appendix D: PATHWAYS Modeling at 12 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf.
²⁴ Id. at 13.

²⁵ Peter Alstone, et al., 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report on Phase 2 Results at 6-2 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698

²⁶ See, e.g., Peter Alstone, 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report on Phase 2 Results at 5-31 (Mar 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698.
²⁷ Id.

Expectations from cost-effective flexible loads

CARB defines flexible loads as the capacity embodied in 10% of forecasted 2018 demand for residential and commercial electric space heating, water heating, A/C, and refrigeration. ²⁸ In the Proposed Scenario, CARB further recognizes the cost opportunity with flexible loads, noting that the range of a savings of \$300 – 500 per metric ton (MT), makes flexible loads one of the best "values" of the proposed measures. ²⁹

As a result of the vast potential of flexible loads both in terms of capacity and environmental and economic benefit³⁰, EDF encourages CARB to consider a more ambitious forecast for flexible loads and to model a range of scenarios for prices and resources. The basis for this assertion is the LBNL study, which posits that load-shifting DR in the form of TOU rates could result in a six-fold reduction in wasted renewable generation capacity. That is, renewable curtailments in 2025 are estimated to be 12% of capacity with no TOU/critical peak pricing load shift, but only 2% (i.e., 98% capacity factor) if 20% of load is shifted to midday. The effective use of these TOU rates is critical for meeting GHG targets –using fossil-based natural gas ramping generation instead of zero-emissions renewables could mean an additional 8 million metric tons of carbon dioxide emissions annually.

In the Scoping Plan, rate design changes are assumed to result in the participation of flexible loads on the grid to help balance renewable generation. Specifically, the plans include flexibility goals for residential and commercial electric water heating, space heating, air conditioning, and refrigeration, as well as "smart charging" goals for EVs. 31 Given the models' assumptions in both scenarios, EDF believes the following considerations are critical for achieving the maximum potential of flexible loads to contribute to cost-effective emissions reductions in the electricity sector.

First, as the LBNL study did,³² it is important for CARB to consider additional technologies and areas where flexible load resources can be developed. The 10% flexible load goal in the Scoping Plan³³ only applies to electric space heating, water heating, A/C, and refrigeration, but neglects consideration of other

²⁸ California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target – Appendix D: PATHWAYS Modeling at 12-13 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf
²⁹ California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target at 65 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

³⁰ Peter Alstone, 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report on Phase 2 Results at 6-2 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698.

³¹ California Air Programment California California California Air Programment California Califor

California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed
 Strategy for Achieving California's 2030 Greenhouse Gas Target – Appendix D: PATHWAYS Modeling at 12-13 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf
 See, e.g., Peter Alstone, 2025 California Demand Response Potential Study – Charting California's

Demand Response Future: Final Report on Phase 2 Results at 5-31 (Mar 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698

³³ California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target at 57 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

- technology and appliances like lighting, motors, pumps, and batteries that can provide substantial shed capacity not to mention industrial and agricultural processes that can add to the resource capacity.
- Second, the Scoping Plan only highlights flexible load targets for 2018;³⁴EDF encourages CARB to model potential growth and development of flexible load capacity between 2018 and 2030.

Accounting for the capabilities of EVs and storage

The Scoping Plan gives limited attention to two emerging and rapidly growing technologies: electric vehicles (EVs) and storage. As discussed earlier, both of these technologies have tremendous potential to ensure the electricity sector achieves its SB 32 targets.

The growth of EVs is poised to accelerate in the coming years due to a number of favorable policies, including SB 350's mandate of "widespread transportation electrification," 35 as well as goals in SB 1275 and the Governor's ZEV mandate aiming to put a minimum number of ZEVs on the road by 2023 and 2025, respectively. 36 In addition, multiple agencies and stakeholders have concluded that achieving California's targets means electrifying the sector responsible for the largest portion of emissions: transportation. Focus needs to be put on ensuring that electrified transport is well-integrated into the grid as a clean energy resource through mechanisms like a price signal, and used smartly as a grid asset (rather than having their presence necessitate a ramp-up of fossil-fuel powered energy).

Although having EVs capable of discharging energy back to the grid is in a very nascent stage, it is rapidly evolving and these types of vehicle-to-grid (V2G) strategies should be considered among the suite of solutions capable of helping to achieve GHG reduction targets. EDF contends that recently released transportation electrification applications can be enhanced by including exploration of V2G to strengthen the grid, potentially with help from Volkswagen settlement funds.³⁷ The same holds true here.

Similarly, storage – both EV batteries and other forms of storage - should be an explicit part of the Scoping Plan. EDF struggles to understand why storage is minimally mentioned in the Scoping Plan update, given the increasing focus being given to this resource in California. In implementing AB 2514's storage mandate, ³⁸ the CPUC states the mandate was designed to abide by three core principles:

³⁴ California Air Resources Board, The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target – Appendix D: PATHWAYS Modeling at 12-13 (Jan. 20, 2017), https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf

³⁵ Public Utilities Code Section 701.1(a), 740.12(a)(1)(D).

³⁶ Senate Bill 1275 (De León, 2014),

 $[\]label{lem:http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB1275; Executive Order B-16-2012, https://www.gov.ca.gov/news.php?id=17472.$

³⁷ United States Environmental Protection Agency, *Volkswagen Clean Air Act Civil Settlement*, https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement#investment ("The CAA 2.0 liter partial settlement requires Volkswagen to invest \$2 billion in ZEV charging infrastructure and in the promotion of ZEVs. To that end, Volkswagen will invest \$800 million in California and \$1.2 billion throughout the rest of the nation, over the next decade").

³⁸ AB 2514 requires the Utilities Commission to open a proceeding and adopt a target for energy storage procurement. Public Utilities Code Section 2836(a)(1). That target was set by the Commission in

- 1. The optimization of the grid, including peak reduction, contribution to reliability needs, or deferment of transmission and distribution upgrade investments;
- 2. The integration of renewable energy; and
- 3. The reduction of greenhouse gas emissions to 80 percent below 1900 levels by 2050, per California goals. ³⁹

Given the Commission's emphasis on meeting GHG targets as a core purpose for the setting of the storage mandate, and its confidence that the mandate will achieve those purposes, ⁴⁰ the Scoping Plan should recognize and incorporate this important resource as a way to help California meets its GHG emission goals.

Coordination with key California Public Utilities Commission proceedings

In order to best understand how different clean energy resources will facilitate achievement of AB and SB 32 goals, it will be important to coordinate with CPUC proceedings that are actively studying how to best deploy a variety of clean energy resources so that processes among the two agencies are mutually informing. These include, but are not limited to, the following topics:

- Residential TOU Rate Pilots As discussed above, load shifting DR in the form of TOU rates can have a tremendous and positive impact on integration of renewable energy and as a consequence, on the achievement of GHG reduction targets. Additionally, TOU rates are an inevitability, with the CPUC and the investor-owned utilities (IOUs) in the midst of developing default pilots.⁴¹ As such, it is imperative that CARB consider how to integrate lessons learned in the residential rate design proceeding in order to best harness the potential of flexible loads.
- EVs There are several proceedings at the Commission designed to study how to
 accelerate EV adoption in the state in light-, medium- and heavy-duty sectors. The three

Rulemaking 10-12-007 at 1,325 megawatts. *Decision Adopting Energy Storage Procurement Framework and Design Program,* Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems, R. 10-12-007 (Oct. 17, 2013) (Final Decision).

³⁹ Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D. 13-10-040, D. 14-10-045) and related Action Plan of the California Energy Storage Roadmap, R. 15-03-011 at 2-3 (emphasis added).

⁴⁰ Assigned Commissioner's Ruling Proposing Storage Procurement Targets and Mechanisms and

"Assigned Commissioner's Ruling Proposing Storage Procurement Targets and Mechanisms and Noticing All-Party Meeting, Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems, R. 10-12-007 at 2 ("energy storage has the potential to offer services needed as California seeks to maximize the value of its generation and transmission investments: optimizing the grid to avoid or defer investments in new fossil fuel-powered plants, integrating renewable power, and minimizing greenhouse gas emissions").

⁴¹ Decision on Residential Rate Reform for Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company, Order Instituting Rulemaking on the Commission's Own Motion to Conduct a Comprehensive Examination of Investor Owned Electric Utilities' Residential Rate Structures, the Transition to Time Varying and Dynamic Rates, and Other Statutory Obligations, R. 12-06-013 (Jul. 3, 2015) (Final Decision).

major IOUs in the state are currently carrying out approved pilots to deploy charging infrastructure in workplaces and multi-unit dwellings, the Commission continues to review EV policy, and the IOUs have pending applications pursuant to the SB 350 directive to pursue widespread transportation electrification.

- Integrated resource plans These plans, pursuant to SB 350, will greatly increase the renewables in the state and theoretically ensure their effective integration. Ramping up to and beyond a 50% RPS will require an "all hands on deck" approach that includes input from CARB. With the roll-out of the IRP delayed, there is concern that the timelines of the Scoping Plan and the utility resource planning are not aligned. Moreover, CARB needs to be cognizant of the lack of clarity currently present regarding key consideration like the role of DERs in the IRP, which will impact IRP inputs to the Scoping Plan assumptions for the electricity sector.
- Storage As mentioned before, the energy storage procured pursuant to the Commission's mandate will be an important consideration when cataloging resources available to help meet GHG targets.
- <u>Distributed energy resources</u> Related to IRPs, the Commission has undertaken multiple proceedings in order to determine how to source distributed resources and establish distribution system needs. Having flexible distributed resources on the grid will enhance the resiliency and the reliability of the grid, as well as helping the state meet its GHG targets. Putting an emphasis on DERs is going to require effort by both CARB and the CPUC in order to ensure that these resources are geographically placed where they are most needed, including in disadvantaged communities. In addition, as stated above, incentives need to be aligned in order for the DER market to be truly successful; this will require serious inquiry into how to revise the utility business model to better ensure this important subset of resources is adequately considered.

⁴² Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Developing Distribution Resources Plans Pursuant to Public Utilities Code Section 769, R. 14-08-013 (Aug. 14, 2014); Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning and Evaluation of Integrated Distributed Energy Resources, R. 14-10-003 (Oct. 02, 2014).

Table 1: LBNL Identified Demand Response Resources

DR Type	Description	Examples	Potential	Reference
Shed	Describes loads that can occasionally be curtailed to provide peak capacity and support the system in emergency or contingency events - at the statewide level, in local areas of high load, and on the distribution system, with a range in dispatch advance notice times.	Examples of Shed technology pathways we include are interruptible processes, advanced lighting controls, air- conditioner cycling, and behind-the-meter storage.	A large potential resource of Shed DR exists in 2025, ranging from 2 to 10 GW, depending on the technology costs and performance scenario, when evaluating the value of DR using the \$200/kW price referent.	Peter Alstone, 2025 California Demand Response Potential Study — Charting California's Demand Response Future: Final Report on Phase 2 Results at 3-13 and 6-1 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698.
Shift	Represents DR that encourages the movement of energy consumption from times of high demand to times of day when there is surplus of renewable generation.	Examples of Shift technology pathways include behind-the-meter storage, rescheduling flexible batch processes like EV charging fleets or pre-cooling with HVAC units.	With 20% of load shiftable, there is up to ~5700 million/year in benefits, and economically cost-effective DR is estimated at up to ~10 percent of daily energy shifted in 2025 (for the high-curtailment, mid-AAEE scenario)	Peter Alstone, 2025 California Demand Response Potential Study— Charting California's Demand Response Future: Final Report on Phase 2 Results at 3-13 and 6-1 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/Do wnloadAsset.aspx?id=6442452698.
Shape	Captures DR that reshapes the underlying load profile through relatively long-run price response or on behavioral campaigns - "load-modifying DR" - with advance notice of months to days.	Examples of Shape resources include TOU and CPP pricing.	An additional ~7,500 GWh of electricity demand would be served by renewables (an increase in utility-scale renewable utilization from 88 to 98 percent) with a 20% TOU/CPP load shift. EDF estimates that approximately eight million tons of carbon dioxide emissions can thereby be avoided, at a savings of \$700 million a year."	Peter Alstone, 2025 California Demand Response Potential Study— Charting California's Demand Response Future: Final Report on Phase 2 Results at 3-13 and 6-1 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698.
Shimmy	Involves using loads to dynamically adjust demand on the system to alleviate short-run ramps and disturbances at timescales ranging from seconds up to an hour.	Examples of Shimmy technology pathways we include are advanced lighting, fast response motor control, and EV charging.	The DR potential study's levelized system value analysis indicated that ~300 MW of Shimmy Load Following Service resources are cost competitive under \$50kW-yr. For Shimmy Regulation DR, the study found ~300 MW to be cost competitive under \$85/kW.	Peter Alstone, 2025 California Demand Response Potential Study — Charting California's Demand Response Future: Final Report on Phase 2 Results at 3-13 and 6-1 (Mar. 1, 2017), available at http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442452698

Comments on Economic Impact Analysis with a Focus on the Electricity Sector and Long-term Targets

Staff leads: James Fine and Erica Morehouse

EDF appreciates the extensive and thoughtful effort by CARB staff to help stakeholders understand the economic consequences of policy choices available for pursuing 2030 GHG cap limits. EDF concurs with and supports the conclusions that the 2030 goal "can be achieved with minimal impact on the growth of California's economy, and that the Proposed Plan is preferred to the alternatives examined" (SP, Appendix A, pg.1).

EDF notes that this finding is particularly robust in light of the many non-monetary and long-term benefits not included in the study. CARB notes (App A, pg. 2) the analysis is focused, "exclusively on the economic effects in California of taking action to reduce GHG emissions" and does not calculate several significant benefits:

- the "economic, environmental, and health benefits of avoiding climate change",
- the dollar value of criteria and toxic pollutant emission reductions,
- the economic value of conserving natural and working lands is not examined.

In the face of significant uncertainties, EDF also supports CARB's ongoing effort to conduct "sensitivity analysis of GHG emission reduction and cost estimates; and analysis of the distribution of economic impacts across regions of the state, including disadvantaged communities" (SP, Appendix A, pg.2). In undertaking that inquiry, EDF notes the importance of considering clean energy resources that have to date been underrepresented in forecasts, undervalued in resource adequacy assessment, and that have significant additional potential to yield benefits for disadvantaged communities and cost-competitively avoid GHG emissions.

Specifically, the economic study of the electricity sector is missing consideration of load-modifying demand response as a strategy to reduce the costs associated with meeting the RPS, with reducing bill impact risks associated with the transition to time-variant electricity pricing, and enhancing the financial rewards and thus penetration and utilization of distributed energy resources (DERs), including load shifting to align demand with cheap solar-sourced electricity and using electric vehicles to store, provide and massage energy.

What is load-modifying demand response in tangible terms for rate payers who may not be plugged into the Internet of Things (IoT), EVs or rooftop solar PV? In fact, it's simple, cheap and intuitive. For most households and many small businesses, the first step is to weatherize the building shell, and then use precooling strategies in advance of evening peak prices. For the growing number (500,000 thus far, with more than 10,000 being sold nationally each month) of EVs, the potential for smart charging is significant.

The Scoping Plan ought to treat behaviors built around EVs, HVACs and IoT as strategies to reduce household energy bills (for electricity, natural gas and gasoline). Doing so will also support electricity and transportation sector decarbonization. For example, enrolling EVs in providing electricity storage reduces both electricity sector natural gas power plant ramping emissions and transport-related GHG emissions. Similarly, encouraging demand shifting to line up with wind and solar generation, as is planned with broad adoption of time-variant electricity

pricing, can enhance the utilization of available renewable, clean, cost-effective generation capacities.

Comments on Methane, Natural Gas, and Oil and Gas Operations Emissions

Staff leads: Tim O'Connor and Irene Burga

Introduction to oil and gas comments

While the progress of the state to cut climate pollution thus far is promising, California has much more to do to address emissions from across the oil and gas value chain, from reducing leaks to reducing combustion. By cutting pollution from this sector more than ever before, not only will California reduce greenhouse gases, it will also cut smog forming co-pollutants, limit toxic air contaminants, reduce energy waste, and increase energy system resiliency. And, as the state achieves the end-points, CARB can improve the conditions of low-income communities and communities of color in California, making the agency's efforts a key part of the strategy to address environmental justice concerns.

Given this context, EDF submits the following comments as suggested improvements to the proposals for reducing emissions from the oil and gas sector:

The Scoping Plan must include a comprehensive discussion and approach to the oil and gas sector and move away from the piecemeal approach that currently exists across multiple agencies and initiatives

California has a number of active and important processes aimed at cutting climate pollution from the numerous array of oil and gas industry segments. As demonstrated time and again, such efforts not only reduce climate change gases, but can result in significant co-pollutant benefits, improve worker safety, reduce needless waste, and protect water and ecosystem health. Among these, efforts include:

- Pursuant to Senate Bill (SB) 1383, California has an overall target of 40 percent reduction in methane for 2030 from 2013 levels, including oil and gas;
- CARB recently adopted the "Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities," the strongest such regulation in the country for regulating methane emissions and health-harming co-pollutants from new and existing oil and gas production facilities;
- California's Department of Oil, Gas and Geothermal Resources (DOGGR) has adopted
 emergency rules for gas storage, and is now developing new permanent rules for natural
 gas storage sites so as to prevent incidences like the Aliso Canyon natural gas storage
 field disaster;
- DOGGR is also said to be in the planning stages of a new rule for oil and gas well
 operations to ensure improved overall well construction, operation and maintenance;
- DOGGR is also in the process of planning for a revamped program to manage and decrease the state's abandoned and idled well inventory;
- Pursuant to SB 1371, the California Public Utilities Commission (CPUC) is requiring natural gas utilities to undertake emissions reduction programs by requiring best industry practices to find, fix and prevent leaks;

- At the local level, Air Districts are undertaking action to cut point source pollution from oil and gas facilities like refineries and production sites;
- In the Scoping plan itself, CARB also has proposed a 20% reduction in emissions from refineries;
- Across the state, at the California Energy Commission (CEC), CARB, local Air Districts, municipalities, and academic institutions - numerous research studies are under way to examine the sources of pollution from the oil and gas sector, including refineries, processing plants, active and abandoned wells, with emphasis on equipment located in hot-spots and urban centers;
- As an outgrowth from the 2016 budget bill (SB 839), at the CEC, the agency is presently
 required to develop a report on the cost and possibility of developing a tracking system
 for gas imported into California, while at CARB the agency is required to develop a
 model that can quantify leaks from oil and gas infrastructure across the value chain;
- At present, CARB is considering extending the timeframe for cap-and-trade to cover large stationary oil and gas facilities past 2020; and
- At present, CARB maintains the operation of the Low Carbon Fuel Standard, a regulation that should facilitate lower lifecycle emissions from oil and gas development by creating market signals for industry operators.

While the state has these numerous laudable goals and efforts to cut oil and gas emissions, (and EDF supports the timely implementation of each), there does not appear to be any single initiative to aggregate all efforts within a single strategic plan or vision, or an effort to fully and accurately quantify the full scope of emissions reductions possible through implementation. Similarly, while oil and gas operators, gas utilities, refinery managers, etc. are going to be covered by a new series of rules, regulatory oversight and enforcement appears to be disaggregated into multiple state and local entities, meaning greater coordination and communication will be key to the overall success of the program.

In furtherance of these observations, EDF recommends the Scoping Plan Update be expanded to include the formation of a standing interagency oil and gas working group for California whose mission is to coordinate and communicate across multiple efforts to reduce pollution from all oil and gas operations within the state. Notably, this is not a recommendation for CARB to perform all of the enforcement and implementation functions of the initiatives laid out above, such a result would be inappropriate. Rather, the Scoping Plan should lay out the processes of reductions and oversight more clearly, while helping ensure the state's multiple agencies are working together in a cohesive and complementary manner. By creating this group and better coordinating and communicating the efforts of the state, California can take advantage of a higher level of synergy across multiple agencies, communicate efforts externally more effectively, and work towards a unified system-wide pollution reduction target that is greater than the sum of the reductions of the individual parts.

Emissions reduction efforts should be based in part on social cost evaluations that include the social cost of methane and nitrous oxides

EDF strongly supports the proposed Scoping Plan Update's inclusion of the Federal Environmental Protection Agency's Interagency Working Group's (IWG) Social Cost of Carbon (SC-CO₂) estimates in compliance with Assembly Bill 197. The social cost estimates were

determined a part of a transparent and peer reviewed process, by outside experts. SC-CO₂ represents the best conservative estimate of the actual costs associated with the emission of carbon dioxide, and therefore should be included in California's regulatory analysis. Incorporating the external costs of carbon dioxide emissions is key to ensuring that regulations evaluate the full range of costs and benefits associated with an action that impacts CO₂ emissions.

The Proposed Scoping Plan, however, fails to mention the social costs related to the emission of other greenhouse gas social costs including methane and nitrous oxides. Estimates of the social cost of methane (SC-CH₄) and nitrous oxide (SC-N₂O) have been developed by the EPA based on the peer-reviewed article: *Marten et al.* ⁴³ which takes a reasonable (although conservative) approach and currently constitutes "the best available science" to inform agency regulation. Specifically, Marten et al. builds on the methodology used by the IWG to develop the SC-CO2, and in their latest technical support update, the IWG adopted the Marten methodology and included estimates of the social cost of methane and nitrous oxide for agencies to apply in their regulatory impact analyses. 45 The Marten et al. methodology thus provides reasonable, direct estimates that reflect updated evidence and provide consistency with the Federal Government's accepted methodology for estimating the SC-CO₂. Furthermore, Marten et al. 's social cost of methane and nitrous oxide estimates directly account for the gas-specific characteristics that determine the link between emissions and monetized damages. This means that no conversion using global warming potentials to convert the social cost of carbon per ton of CO₂ into a social cost per ton of methane or nitrous oxide is needed because the SC-CH₄ and SC-N₂O directly measures the social cost of a ton of methane or nitrous oxide emitted to the atmosphere. EDF concurs with the Institute for Policy Integrity recommendation that CARB should use the SC-CH₄ and SC-N₂0 when regulating those pollutants.⁴

Use of pollutant specific social costs will help to avoid the inaccuracies associated with using a global warming potential multiplier, and will remove the required choice of what time horizon to use. Proposed regulations that specifically concern methane or nitrous oxide should consider the specific social costs to those pollutants. CARB should include these values in the Scoping Plan to ensure that when considering regulating specific pollutants the most accurate estimates of the social cost are used in a cost benefit analysis. As CARB is the lead agency tackling California's greenhouse gas emissions, it is important that the scoping plan clearly illustrate how the social costs of multiple pollutants are to be considered going forward, for other agencies to follow.

⁴³ Alex L. Marten et al., Incremental CH4 and N2O Mitigation Benefits Consistent With the US Government's SC-CO2 Estimates, Climate Policy (2014): Available at: http://www.tandfonline.com/doi/full/10.1080/14693062,2015.1070550.

⁴⁴ See Executive Order 13,563, 76 Fed. Reg. 3821 (January 18, 2011).

⁴⁵ Interagency Working Group on the Social Cost of Greenhouse Gases, Addendum: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide 3 (2016) ("This addendum summarizes the Marten et al. methodology and presents the SC-CH4 and SC-N2O estimates from that study as a way for agencies to incorporate the social benefits of reducing CH4 and N2O emissions into benefit-cost analyses of regulatory actions").

⁴⁶ Institute for Policy Integrity, NYU Law School, Comments on Discussion Draft, 2030 Target Scoping Plan Update (Dec. 2, 2016) available at:

http://policyintegrity.org/documents/Policy_Integrity_ARB_use_of_SCC_under_AB_197_FINAL.pdf

Updating the state's greenhouse gas facility emissions rates based on the best science around methane will create new opportunities to ensure emitters are accountable for the full amount of their emissions

Recent evidence from state-sponsored, local-sponsored, and external peer-reviewed scientific studies indicate that individual facility estimates at large stationary sources in the oil and gas sector have undercounted and underreported their emissions of methane. Although methane emissions from oil and gas is a relatively small number compared to the rest of the statewide inventory, due to methane's potent global warming impact (84x that of CO₂ on a 20-year basis), this undercounting can represent a large number on a per facility basis and is capable of having a demonstrable impact on the overall statewide inventory for greenhouse gases. Accordingly, it should be fixed.

Between 2014 and 2016, the CEC conducted a series of flyover studies on refineries, gas fired power plants, and other facilities using aerial measurements to estimate, among other things, methane emission rates. In this study, as detailed in a 2016 presentation to the CEC in the Integrated Energy Policy Report, ⁴⁷ the CEC found that refinery methane emissions rates are anywhere between 4 and 25 times higher than reported to the state and the US EPA for the purposes of facility emissions inventories. By way of follow-up and to assess facility inventories and hot-spots in their areas of jurisdiction, local Air Pollution Control Districts like the Bay Area Air Quality Management District conducted similar studies and found similar, if not more detailed and alarming results. Similarly, in March 2017, scientists from Purdue University and EDF published a paper ⁴⁸ finding refinery emissions may be 11 to 90 times higher than previously reported. For natural gas power plants, the numbers were even more striking, with Purdue and EDF finding emissions rates 21 to 120 times higher than prior reported emissions estimates.

With typical CO₂ emissions from a refinery anywhere between 1.5 and 6 MMT CO₂ per year, refineries and gas plants are among the largest point source emitters in the state – meaning these new science based estimates are worth a hard look. For example, using back of the envelope conversions and comparisons, the importance of methane's contribution to facility inventories can easily be seen by turning observed methane rates (30 to 750 kg of methane per hour) into carbon dioxide equivalencies based on methane's 20 year GWP. As these facilities try to run 24 hours a day every day of the year, these emissions rates for methane equate to between 22,000 and 550,000 metric tons CO₂e per year, or anywhere between 1 and 10% of total facility emissions. Accordingly, if facilities do not have to report these emissions in their annual inventories, and are not required to manage those emissions, California will be losing a key opportunity to control a potent greenhouse gas.

⁴⁷ Fischer M., From Wells to Burners: Methane Emissions from California Natural Gas, June 7st, 2016

⁴⁸ Lavoie T., et al., Assessing the Methane Emissions from Natural Gas-Fired Power Plants and Oil Refineries, Environ. Sci. Technol., 2017, 51 (6), pp 3373–3381

The Scoping Plan is a unique opportunity the bring together many energy market reform processes that ensure a transition away from heavy reliance on fossil fuel energy and towards a lower carbon, more reliable energy system

The Proposed Plan builds on key programs and adds new initiatives that aim to continue to shift the California economy away from heavy dependence on fossil fuels and towards a thriving sustainable future that delivers continued economic growth, job generation, and a wide range of environmental benefits to all California communities. However, more specificity as to how the Scoping Plan will achieve a reduction in California's heavy reliance on natural gas for energy system balancing – with achievable metrics beyond what is currently laid out - is needed in order to attain this somewhat general goal. Furthermore, while the Proposed Plan pays out the goal of achieving a 50 percent Renewables Portfolio Standard (RPS) by 2030, some wholesale energy market mechanisms in California do not support the transition and integration of vast amounts of flexible clean energy resources into the grid, in particular those that can balance resources such as intermittent wind and solar. In order for the state's climate and renewable energy goals to be achieved, CARB must work with other state agency to create a system that will allow the successful large-scale penetration of renewables onto the grid.

In the existing system, market design gaps impede effective price formation/price discovery necessary to foster large scale investment in flexible energy resources. That's why enhanced flexible capacity requirements that ensure long-term supply of flexible resources are needed. When flexible energy resources aren't properly compensated to reflect the value of their services to the grid, as in the current system, price signals will be distorted. For example, CAISO's current market design doesn't allow generators to reflect sub-day variations in fuel procurement costs in their market bids, muting price signals that reflect the true costs of gas fired generation. The design also doesn't allow generators' actual costs of gas procurement to be reflected in their market bids (a gas price index is used to calculate fuel costs), thereby obscuring price signals in the wholesale electric market. When these market design gaps are corrected, overall competition in the energy system will increase, and yield reduced overall reliance on gas as the single fuel source. Additionally, it is important to highlight that California's heavy reliance on natural gas is projected to increase as greater amounts of renewables are integrated into the grid to meet California's greenhouse gas reduction targets.

EDF urges CARB to consider the Scoping Plan as a unifying strategic document that takes on the issue of facilitating coordinated market design changes that help address this increasing reliance, and include a discussion of market refinements within the scoping plan document. We ask that your agency work with the CPUC, CEC, CAISO and local municipalities like LADWP in developing mechanisms, including adoption of Integrated Resources Plans (IRPs) that engage and enlist utilities to pursue the procurement of resource mixes capable of achieving deep carbon reductions while maintaining reliability in alignment with a model resource mix. These mechanisms will allow utilities to balance variable electric generating units with low-carbon, low-cost and reliable energy resources.

Reduce the footprint of imported gas into California

Under AB 32 and under the principles of good governance, the state has the responsibility to ensure the benefits of its actions aren't being over-counted, or that those actions aren't otherwise

causing undesired impacts. Thus is the case with methane emissions from within the value chain of the natural gas the state uses, even though much of those emissions occur outside of state lines.

As we have written to CARB previously, AB 32 requires the state board to minimize leakage of greenhouse gases to achieve climate pollution goals. Under the law, the definition of leakage is "a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state." Pursuant to the definition, EDF argues that emissions from upstream sources of natural gas imported into California fit squarely into the framework of AB 32, and thus reducing this source of emissions must be within the goals of the agency and included in the Scoping Plan and SLCP strategy. Pursuant to this requirement, CARB must undertake an effort to propose and implement solutions to account for and reduce emissions associated with equipment and processes that are engaged in the production, processing and transmission of natural gas imported into California. Unfortunately, however, while the Proposed Scoping Plan mentions methane emissions from upstream emissions, it neither attempts to quantify the amount of gas leaked, or propose emission reduction measures – this is a critical shortcoming.

California imports nearly 90 percent of its natural gas from regions across western North America. Using figures from the California gas report associated with gas imported over interstate transmission lines for core and industrial customers, and assuming a leakage rate of 2.1%, EDF calculated the emissions associated with leakage from gas imports into California is approximately 60 MMTCO2e using a 20-year global warming potential for methane. EDF presented these figures to CARB and the CEC in a June 2016 workshop and to date, has not received information contradicting this assessment as too high (notably some have argued it is too low). With this analysis, EDF is concerned that leakage of methane within the natural gas value chain can and will undermine the climate benefit of using that natural gas in California – as has been done for several decades as part of the comprehensive air and climate pollution reduction program. Put simply, while natural gas may be cutting in-state emissions, the increased use of natural gas in California pursuant to the state's long term emissions reduction efforts is being undermined by methane leaks from pipes and equipment that produce and transport gas into California from other states.

California is on a good path toward addressing its own methane pollution problems, recently adopting the most stringent standards in the nation for methane emissions from oil and gas production, but if California is to truly address the climate and air quality damage that comes from its natural gas use, it has to play an active role in efforts by other states. For these reasons, we urge the Board to specify in the Proposed Plan methods for targeting leakage reduction in upstream imported natural gas. Ample opportunities exist, EDF respectfully requests the Board the take this challenge head on.

121-2

Comments on Natural and Working Lands Including Agricultural Lands

Staff Lead: Robert Parkhurst

EDF is committed to promoting science-based solutions for farmers, ranchers, and landowners to help the state address the impacts of climate change and bring greenhouse gas emissions to 40% below 1990 levels by 2030. We are dedicated to understanding the value and promoting the

implementation of practices which increase the climate benefits that working lands provide. We also appreciate the continued effort that CARB, CDFA, and CNRA have put into identifying how climate-smart agriculture can be a part of the climate solution.

We appreciate the effort CARB plans to take to "expand the scope of the inventory using the most recent data available and plans to update... emissions estimates for soil carbon, urban forestry, and croplands by mid-2018." This approach will help all stakeholders better understand both the baseline inventory for natural and working lands as well as better understand the potential emission reductions and carbon sequestration from these lands.

Working land carbon and nitrogen cycling is complex and the science in this area continues to evolve. There is a growing body of research, much of it funded by CARB, about the nitrous oxide emissions from a number of California crops including tomato, wheat, lettuce, ⁴⁹ rice, alfalfa,⁵¹ and cotton. There is additional research on the carbon sequestration potential of various practices on California rangelands. 52 Even with all this research, much of the GHG impacts of practices on working lands are not well understood and have high levels of uncertainty. Studies are also limited by geography, practice and soil type.

It is with this background in mind that we offer our comments on the updates to the 2017 Scoping Plan Update (hereafter referred to as the Update).

Long-term objectives

One of the most important tenets in the Update is CARB's ongoing reliance on the best available science to select and promote actions to mitigate or adapt to climate change. EDF supports CARB's objective to establish "agriculture sector GHG emission reduction planning targets for the mid-term time frame and 2050." We urge caution, however, at the objective to "Enhance the resilience of and potential for carbon sequestration on those lands through management and restoration."53 This is an area where the best available science is limited. As stated in previous comments on the state of the science for soil carbon sequestration, recommendations for practices that sequester carbon and targets for state-level sequestration must address potential constraints: "(i) the quantity of C stored in soil is finite, (ii) the process is reversible and (iii) even if SOC is increased there may be changes in the fluxes of other

⁴⁹ Horwath, W.R., Burger, M. "Assessment of Baseline Nitrous Oxide Emissions in California Cropping Systems." California Air Resources Board, Contract No. 08-324.

https://www.arb.ca.gov/research/apr/past/08-324.pdf.

Dittelkow, C.M., Assa, Y., Burger, M., Mutters, R.G., Greer, C.A., Espino, L.A., Hill, J.E., Horwath, W.R., van Kessel, C., Linquist, B.A. "Nitrogen Management and Methane Emissions in Direct-Seeded Rice Systems." Agronomy Journal 106.3 (2014): 968-980.

The systems of N2O in flood-

irrigated alfalfa: a comparison of field measurements, DNDC model simulations and IPCC Tier 1 estimates." Nutrient Cycling in Agroecosystems 106.3 (2016): 335-345.

⁵² Ryals, R., Hartman, M.D., Parton, W.J., DeLonge, M.S. and Silver, W.L., 2015. Long-term climate change mitigation potential with organic matter management on grasslands. Ecological Applications, 25(2), pp.531-545.

Scoping Plan Update, p 109.

greenhouse gases, especially nitrous oxide (N₂O) and methane."⁵⁴ Furthermore, because of the potential for leakage, yield impacts are a key variable and all metrics should can into account both absolute and yield-scaled emission reductions.

We recommend that CARB take a similar approach to soil carbon sequestration as taken to CARB-supported research on GHG emissions from nitrogen fertilizer between 2008 to 2016. 55 A comprehensive look at practices which can sequester carbon in California's complex agricultural landscape is needed to identify and fill gaps in scientific knowledge and assist in setting a "comprehensive and strategic path forward." Only then can practices be identified and promoted with California's farmers and ranchers.

Challenges with NRCS conservation practice standards

CARB and several of its sister agency programs, such as the Healthy Soils Initiative, are relying on USDA Natural Resource Conservation Service Conservation Practice Standards for identification of practices which can be implemented to reduce GHG emissions. More than 100 standards have been developed over decades and represent the best technical information on the implementation of science-based conservation practices. It is important to note, however, that these NRCS practice standards were not developed with a specific focus on GHG emission reductions. Caution should be taken in recommending practices where there is clear environmental value in their implementation, but not significant science to support the reduction of GHG emissions.

124-3

Evaluating modeling estimates

We request a detailed list of data and references used to create the California natural and working lands carbon model (CALAND) be made public. In the current version of the Update few references are provided and those that are noted do not have sufficient information for investigation. For example, on page 7 of Appendix G, the reference for urban vegetation is listed as Bjorkman et al. 2015. A Google scholar search for this reference did not provide any articles related to urban vegetation, but several articles related to forestry. Furthermore, no references to the cropland estimates were provided in Appendix G.

121-4

Only when the references and supporting documentation for the model are made available can our team fully evaluate the model and its objective of informing the goal, target acreage, and practice recommendations for achieving GHG benefits from practices on agricultural lands. Clarification on the emissions scope and boundaries, whether soil organic carbon or related methane and N₂O flux, should be explicitly identified for this model, since there can be a substantial impact on methane and N₂O through the implementation of different management scenarios. Further, no additional information has been provided on the calibration, validation, or

Scoping Plan Update, p. 110.

⁵⁴ Powlson, Whitmore and Goulding, 2010. Soil carbon sequestration to mitigate climate change: a critical re-examination to identify the true and the false. European Journal of Soil Science, Feb 2011, 62, pp.42-55

⁵⁵ A great summary of all the research conducted on nitrous oxide emissions can be found at https://www.arb.ca.gov/ag/fertilizer/meetings/meetings.htm

uncertainty in the model outside of the very limited information provided in the presentation at the December 14 workshop. Any and all supporting journal articles, references, and research for the model, abatement calculations, and uncertainty analyses should be shared with the public. This is common practice for natural and working lands GHG quantification methodologies. Without this information, it is not possible to assess the degree to which "[t]he modeled management strategies" were based on "well-established science" and the certainty to which "the strategies increase carbon sequestration and resilience." ⁵⁷

Cover crops and carbon sequestration

We note that in the Update there is still an indirect mention to cover crops and vague references to other practices that promote carbon sequestration. Cover crops have been shown to improve soil health, and EDF supports and promotes the planting of cover crops through our Sustainable Agriculture program. However, we do not report the carbon sequestration benefits because varied results in the scientific literature indicate that cover crops may actually increase or decrease overall sequestration depending on soil type, geography, and additional interacting practices. Therefore, extreme caution should be taken regarding the sequestration potential of any practice without conducting additional research as recommended above. Even then, the practices should be specified by crop, geography, and soil type at a minimum.

A recent meta-analysis concluded that cover crops can sequester soil carbon, although the extent of carbon uptake is ultimately limited by SOC saturation. So However, increasing soil organic carbon can increase N_2O emissions, leading to uncertain net impacts in greenhouse gas emissions. Another recent meta-analysis likewise concluded that the impact of cover crops on N_2O emissions was extremely variable, in some cases leading to a decrease but in other cases leading to an increase in N_2O emissions. n_2O emissions.

The one practice where there is significant science to support carbon sequestration is the avoided conversion of rangelands to croplands or urban infrastructure. There are well-reviewed protocols by both the Climate Action Reserve and American Carbon Registry already in place for avoided conversion of grasslands. When grasslands are disturbed, such as when the land is tilled for crop cultivation, a significant portion of the stored carbon oxidizes and decays, releasing CO₂ into the atmosphere. This is carbon which has been stored in the soil over decades by natural cycles of growth and decay. By preserving intact grasslands or rangelands, CARB can maintain the carbon sequestered throughout the state. This is particularly important as rangeland ecosystems cover approximately half the land area of California. ^{61, 62}

121-5

⁵⁷ Scoping Plan Update, p. 113.

⁵⁸ Poeplau, C. and Don, A., 2015. Carbon sequestration in agricultural soils via cultivation of cover crops—A meta-analysis. Agriculture, Ecosystems & Environment, 200, pp.33-41.

⁵⁹ Bos, J.F., ten Berge, H.F., Verhagen, J. and van Ittersum, M.K., 2016. Trade-offs in soil fertility management on arable farms. Agricultural Systems

⁶⁰ Basche, A.D., Miguez, F.E., Kaspar, T.C. and Castellano, M.J., 2014. Do cover crops increase or decrease nitrous oxide emissions? A meta-analysis. Journal of Soil and Water Conservation, 69(6), pp.471-482

⁶¹ Brown, S., A. Dushku, T. Pearson, D. Shoch, J. Winsten, S. Sweet, J. Kadyszewski. 2004. Carbon supply from changes in management of forest, range, and agricultural lands of California. Winrock

Methane emissions from the dairy and livestock sectors

Approximately half of all methane emissions come from California's dairy sector and it is estimated that about half of the dairy emissions come from enteric fermentation and the other half from manure management. However, measuring these emissions has been an elusive and evolving science. As a colorless and odorless gas, methods to measure these emissions have been largely based on bottom-up emission calculations. For example, the U.S. EPA estimates relative methane emissions from different livestock pathways based on per cow averages of biological factors, adjusting for different regions. ⁶³ Unfortunately, farmers have neither proven tools to determine their methane emissions nor information on how best to minimize those emissions on their farms.

EDF is working to better quantify farm-wide methane emissions from different methane sources at California dairies. This work builds on EDF's earlier efforts to develop good estimates of methane released through the energy sector where we pioneered tools to measure methane emissions from oil and gas exploration – the largest source of U.S. methane emissions – through 16 independent scientific studies. The precise measurements that resulted have facilitated efforts to reduce methane emissions from oil and gas operations. Drawing on this experience, EDF is testing ways to measure and inventory emissions from livestock operations. Over the past year and with several partners, we conducted measurements at two dairies in California. We conducted these measurements based on three methodologies to measure methane: one taken by aircraft above the dairies and two using different methods taken on the ground. This comparison is intended to help clarify differences in reported emissions and establish a clearer baseline for emission reductions. EDF expects to have a paper published in the next year to document the results of these measurements.

Conclusion

Thank you for this opportunity to provide these comments on the Proposed 2030 Scoping Plan. For questions please contact the staff lead identified for each section. We look forward to working with CARB, their sister agencies, and other stakeholders to implement California's ambitious commitments to reduce danger climate pollutants while creating myriad other benefits for California.

International, for the California Energy Commission, PIER Energy-Related Environmental Research. 500-04-068F. 144 p

http://www.edf.org/sites/default/files/methane studies fact sheet.pdf

Havstad, K., D. Peters, B. Allen-Diaz, J. Bartolome, B. Besterlmeyer, D. Briske, J. Brown, M. W. Burnson, J. Herrick, L. Huntsinger. 2009. The Western United States Rangeland: A Major Resource. Grassland: quietness and strength for a new American agriculture. American Society of Agronomy 75-94
 EPA, U. S. 2016. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014. Annex 3.10. Methodology for Estimating CH4 Emissions from Enteric Fermentation. April 15, 2016. U.S. Environmental Protection Agency.

⁶⁴ EDF. 2016. Methane Research: The 16 Study Series.













April 10, 2017

Via Electronic Filing on ARB Website

Richard Corey, Executive Officer California Air Resource Board 1001 I Street Sacramento, CA 95814

Re: Comments on the 2030 Proposed Scoping Plan

Dear Mr. Corey:

The California Environmental Justice Alliance represents thousands of residents who are the first to breathe smokestack and tailpipe emissions that the 2030 Proposed Scoping Plan is trying to reduce. We are undaunted by climate change and generations of pollution, and with that spirit offer our frontline perspective to propel California to achieve its 2030 climate targets. We offer the following three, overarching recommendations for improving the Scoping Plan.

EJ ELEMENT. Environmental justice (EJ) leaders were instrumental in passing AB 32, SB 32 and AB 197. EJ is built into the DNA of our climate laws. SB 32 emphasizes that "The State Air Resources Board shall achieve the state's more stringent greenhouse gas emission reductions in a manner that benefits the state's most disadvantaged communities." Of all the Scoping Plans, the Proposed Scoping Plan has had the most EJ content we've ever seen, but CARB has yet to integrate EJ in its climate strategies. Inspired by San Diego's General Plan, an "EJ Element" can also serve the Scoping Plan by specifying how the plan is going to benefit EJ communities. That means the economic scenarios and each sector strategy—from industry, energy to transportation—will each have an EJ element outlining emissions reductions programs, public health improvements, and potential economic benefits for disadvantaged communities (DAC).

PROTECT EJ COMMUNITIES. Climate law under AB 197 instructs CARB to "protect the state's most impacted and disadvantaged communities" through "direct emission reductions at large





stationary sources of greenhouse gas emissions sources and direct emission reductions from mobile sources." The Scoping Plan must outline how it will implement AB 197 through the Scoping Plan.

As documented in the prominent report A Preliminary Environmental Equity Assessment Of California's Cap-and-Trade Program (submitted as an attachment), cap and trade has failed to deliver the air quality and public health benefits that EJ communities need and deserve. Unfortunately, the Proposed Scoping Plan immediately favored the Cap and Trade scenario without fully studying or addressing how the trading program may be harming fenceline communities. The EJ movement, and CEJA, have long preferred a cap and tax alternative to cap and trade, but the cursory analysis of this alternative in the plan is inadequate. The Scoping Plan must better analyze both the cap and tax scenarios, as well as integrating more protections for the most impacted communities by preventing carbon trading in EJ communities, eliminating offsets, and limiting free allowances. Close these loopholes in the current Cap and Trade program because they have been to the detriment of low-income Latinos, Blacks and Asians living next to industrial facilities.

122-1

Key to understanding the threats to EJ communities is understanding emission levels at specific, cap and trade facilities located in our communities. The Scoping Plan has yet to outline how it will address the data gaps identified in both the *Preliminary Analysis* and the *Impacts of Greenhouse Gas Limits on Disadvantaged Communities* study released by the Office of Environmental Health Hazard Assessment. Standardizing emissions data across regulatory agencies, making facility level data publicly available, and studying impacts in EJ communities needs to continue and improve.

DRIVE DOWN EMISSIONS BY INCENTIVIZING EARLY ACTION. Markets need clear price signals to transform, the current price of carbon in CA isn't fulfilling its function of driving down emissions. The abundance of allowances for refineries, gas power plants, and large industries under Cap and Trade is also a disincentive to clean energy investments. The 2030 and 2050 climate targets leave little room for reductions on paper. California must step up its climate program starting in 2020 with a direct carbon fee set at the social cost of carbon of around \$50/ton, which will bring us in line with Canada. We appreciate staff's use of the social costs of

2











carbon calculator, and encourage you to improve the tool for California conditions with inclusion of health costs. The revenues generated should be used for continued mitigation programs especially to benefit DAC, issue dividends to the public (with larger proportions to lower income households to protect them from price spikes), and a just transition fund to train former industrial workers and EJ communities for jobs in the clean energy economy.

We look forward to seeing environmental justice and these ideas shine in the Final Draft of the Scoping Plan. Along with communities represented by the Environmental Justice Advisory Committee, we look forward to partnering with CARB and other agencies to implement these exciting climate programs.

Sincerely,
Amy Vanderwarker,
Co-Director, California Environmental Justice Alliance

Carolina Martinez, Director of Policy, Environmental Health Coalition

Laura Muraida, Director of Research, SCOPE

Parin Shah, Policy Strategist, Asian Pacific Environmental Network

Martha Arguello, Executive Director, Physicians for Social Responsibility-LA

Veronica Garibay and Phoebe Seaton, Co-Executive Directors, Leadership Counsel for Justice and Accountability

RESEARCH BRIEF - SEPTEMBER 2016





A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP-AND-TRADE PROGRAM

By Lara J. Cushing^{1,5} Madeline Wander⁴ Rachel Morello-Frosch^{1,2} Manuel Pastor⁴ Allen Zhu³ James Sadd⁶

University of California, Berkeley

Department of Environmental Science, Policy, and Management

²School of Public Health

3 School of Engineering

"University of Southern California, Program for Environmental and Regional Equity (PERE)

San Francisco State University, Department of Health Education

Occidental College, Department of Geology







OVERVIEW

California's cap-and-trade program is a key strategy for achieving reductions in greenhouse gas (GHG) emissions under AB32, the California Global Warming Solutions Act. For residents living near large industrial facilities, AB32 offered the possibility that along with reductions in GHGs, emissions of other harmful pollutants would also be decreased in their neighborhoods. Carbon dioxide (CO₂), the primary GHG, indirectly impacts health by causing climate change but is not directly harmful to health in the communities where it is emitted. However, GHG emissions are usually accompanied by releases of other pollutants such as particulate matter (PM₁₀) and air toxics that can directly harm the health of nearby residents.

In this brief, we assess inequalities in the location of GHG-emitting facilities and in the amount of GHGs and PM₁₀ emitted by facilities regulated under cap-and-trade. We also provide a preliminary evaluation of changes in localized GHG emissions from large point sources since the advent of the program in 2013. To do this, we combined pollutant emissions data from California's mandatory GHG and criteria pollutant reporting systems, ^{1,2} data on neighborhood demographics from the American Community Survey, cumulative environmental health impacts from the California Environmental Protection Agency's CalEnviroScreen tool, and information from the California Air Resources Board (CARB) about how regulated companies fulfilled their obligations under the first compliance period (2013-14) of the cap-and-trade program. Our methodology is described in greater detail in the appendix to this report.

In this analysis, we focus primarily on what are called "emitter covered emissions," which correspond to localized, in-state emissions (derived mostly from fossil fuels) from industries that are subject to regulation under cap-and-trade. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes).

We found that regulated GHG-emitting facilities are located in neighborhoods with higher proportions of residents of color and residents living in poverty. In addition, facilities that emit the highest levels of both GHGs and PM₁₀ are also more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity cobenefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged communities. In terms of GHG emission trends, in-state emissions have increased on average for several industry sectors since the advent of the cap-and-trade program, with many high emitting companies using offset projects located outside of California to meet their compliance obligations. Enhanced data collection and availability can strengthen efforts to track future changes in GHG and co-pollutant emissions and inform decision making in ways that incentivize deeper in-state reductions in GHGs and better maximize public health benefits and environmental equity goals.

FINDINGS

1. Facilities that emit localized GHGs are located in more disadvantaged communities.

On average, neighborhoods with a facility that emitted localized GHGs within 2.5 miles³ have a 22 percent higher proportion of residents of color and 21 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility. Neighborhoods within 2.5 miles of a facility are also more than twice as likely to be among the worst statewide in terms of their CalEnviroScreen score, a relative ranking of cumulative impact based on indicators of social and environmental stressors to health (Table 14).

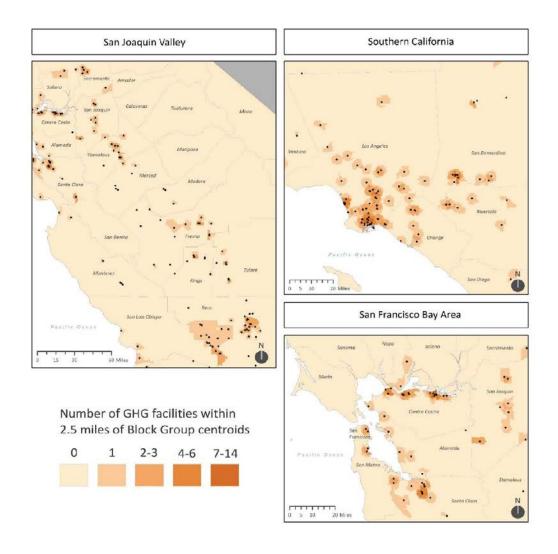
TABLE 1
Characteristics of Neighborhoods within 2.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 2.5 miles (N=6,397)	Block groups with no facilities within 2.5 miles (N=16,705)
Mean % People of Color	66%	54%
Mean % People Living Below Twice the Poverty Level	41%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	17%	7%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	31%	15%

2. Many of California's residential communities are within 2.5 miles of more than one GHG-emitting facility (Figure 1').

These communities are home to a higher proportion of residents of color and people living in poverty than communities with no or few facilities nearby. Indeed, the higher the number of proximate facilities, the larger the share of low-income residents and residents of color (Figure 2).

FIGURE 1
Residential Proximity to Facilities Reporting Emitter Covered GHG Emissions during the 2013-14
Compliance Period (N=321 facilities)



http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade

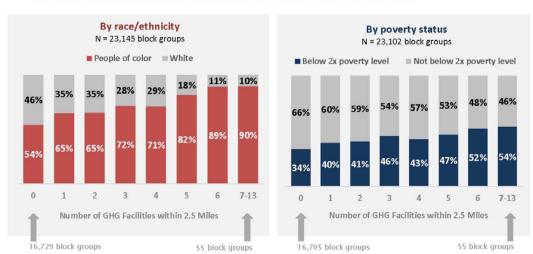
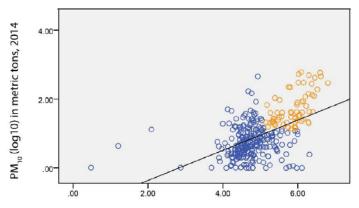


FIGURE 2
Demographics in Block Groups near GHG-emitting Facilities (N=255 facilities)

3. While GHG emissions do not generally have direct health impacts, co-pollutants such as particulate matter (PM₁₀) do. Such emissions are correlated (Figure 3°), with large GHG emitters reporting that they emit more particulate matter. The largest emitters of both GHGs and PM₁₀ also tend to be located near neighborhoods with higher proportions of disadvantaged residents (Table 27).

The neighborhoods within 2.5 miles of the 66 largest GHG and PM₁₀ emitters (defined as the top third in emissions of both PM₁₀ and GHGs and highlighted in orange in Figure 3) have a 16 percent higher proportion of residents of color and 11 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility (Table 2). Compared to other parts of the state, nearly twice as many neighborhoods within 2.5 miles of these highest-emitting facilities are also among the worst statewide in terms of their CalEnviroScreen score. We also found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6 in the Appendix).

FIGURE 3
Correlation between Emitter Covered GHG Emissions and Particulate Matter (N=317 facilities)



Emitter Covered GHG Emissions (log10) in metric tons, 2014

TABLE 2 Characteristics of Neighborhoods within 2.5 miles of the top GHG- and PM_{10} - Emitting Facilities (N=66 facilities)

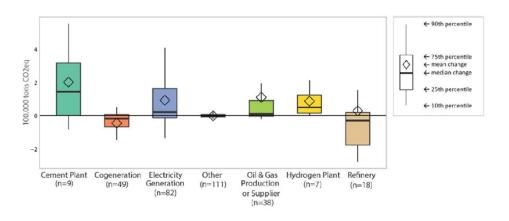
	Block groups within 2.5 miles of the largest GHG and PM ₁₀ emitters (N=1,290)	All other block groups (N=21,812)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	40%	36%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	18%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	35%	19%

4. While overall, GHG emissions in California have continued to drop from a peak in 2001, we find that, on average, many industry sectors covered under cap-and-trade report increases in localized in-state GHG emissions since the program came into effect in 2013.8

Only a portion of the state's total GHG emissions are regulated under the cap-and-trade system. For example, the industrial and electrical sectors accounted for about 41 percent of the state's estimated total GHGs emissions in 2014. (The remainder originated from sectors such as transportation, commercial and residential buildings, and agriculture.) As a result, overall emissions and emissions regulated under cap-and-trade can exhibit slightly different patterns. Moreover, not all emissions regulated under the cap-and-trade program occur in-state. For example, according to CARB's 2016 Edition of the California GHG Emission Inventory, emissions from electrical power decreased by 1.6 percent between 2013 and 2014. However, when these emissions are disaggregated, we see that it is the emissions associated with imported electricity that decreased, while emissions from in-state electrical power generation actually increased.

Figure 4 shows the distribution of the change in localized GHG emissions regulated under cap-and-trade for two time periods: the two years prior and the two years after the program came into effect. We present the range in emissions changes reported by individual facilities within seven industry sectors for 2013-14 versus 2011-12; this includes the median (50th percentile), mean (average), and 10th to 90th percentile of changes in emitter covered emissions for 314 GHG facilities. For example, six of the nine cement plants included in Figure 4 reported increases in emissions during 2013-14 relative to 2011-12. The median value corresponds to the 143,295-ton increase reported by the cement plant in the middle of the distribution (5th highest emitting facility out of the nine total). Similarly, the 25th and 75th percentiles correspond to the increases reported by the 3th and 7th highest emitting facilities. The facilities with the minimum and maximum emissions changes are not shown in this graph to make it more legible; for example, the Cemex Victorville cement plant reported an increase of over 843,000 tons, an amount that far exceeds the range portrayed in Figure 4.

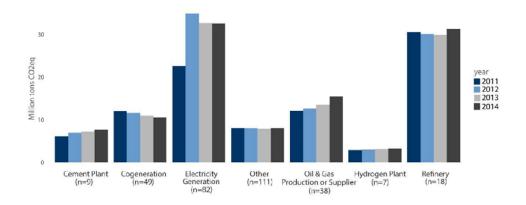
FIGURE 4
Change in Emitter Covered GHG Emissions by Industry Sector (N=314 facilities)



http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade

Figure 5 shows temporal trends in total emitter covered emissions (the sum of emissions from all individual facilities) by industry sector for 2011-2014. The number of facilities can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report GHG emissions to CARB. In both Figure 4 and Figure 5, we included only those facilities that: 1) report to the inventory every year during the four-year period, and 2) report at least some emitter covered emissions during those same four years. Again, the upward trend in several sectors is notable.

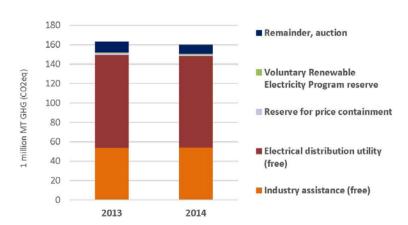
FIGURE 5
Temporal Changes in Total Emitter Covered GHG Emissions by Industry Sector



5. Between 2013 and 2014, more emissions "offset" credits were used than the total reduction in allowable GHG emissions (the "cap"). These offsets were primarily linked to projects outside of California, and large emitters of GHGs were more likely to use offset credits to meet their obligations under cap-and-trade.

The cap-and-trade program requires regulated companies to surrender one compliance instrument—in the form of an allowance or offset credit—for every ton of qualifying GHGs they emit during each compliance period. These instruments are bought and sold on the carbon market. The total number of allowances is set by the "cap," which decreases by roughly 3 percent per year in order to meet GHG reduction targets. In 2013 and 2014, most allowances were given to companies for free for leakage prevention, for transition assistance, and on behalf of ratepayers (Figure 6). Additional offset credits were generated from projects that ostensibly reduce GHGs in ways that may cost less than making changes at a regulated facility.

FIGURE 6
Allocation of Allowances



Regulated companies are allowed to "pay" for up to 8 percent of their GHG emissions using such offset credits. The majority of the offset credits (76 percent) used to date were generated by out-of-state projects (Figure 7). Figure 8 shows that most offset credits were generated from projects related to forestry (46 percent) of and the destruction of ozone-depleting substances (46 percent). Furthermore, over 15 percent of offset credits used during the first compliance period were generated by projects undertaken before final regulations for the cap-and-trade program were issued in 2011, calling into question whether these GHG reductions can be attributed to California's program, or whether they might have happened anyway.

FIGURE 7 Origin of Offset Credits

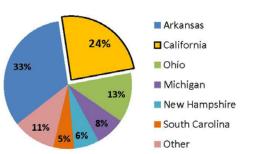
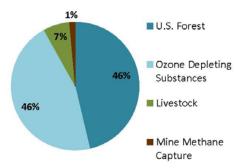


FIGURE 8
Offset Credits by Project Type



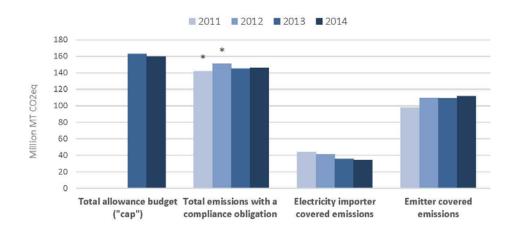
http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade

Page 8

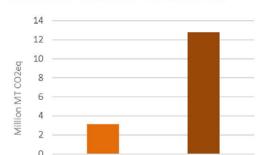
During the first compliance period of 2013-14, the total emissions that were subject to a compliance obligation (the second set of columns in Figure 9) were lower than the cap set by the allowance budget (left-most set of columns in Figure 9). This total includes both the emitter covered emissions that have been the focus of our analysis so far (right-most set of columns in Figure 9) and out-of-state emissions associated with imported electricity (which went down every year during the four-year period as shown by the third set of columns in Figure 9). Offset credits worth more than 12 million tons of CO₂₆₀ were utilized to meet these obligations. These offsets represent 4.4 percent of the total compliance obligation of all regulated companies and over four times the targeted reduction in GHG emissions from 2013 to 2014 as established by the cap (Figure 10).

We found that the majority of companies did not use offset credits to meet their compliance obligation; however, those companies that *did* use offsets tended to have larger quantities of GHG emissions. The top 10 users of offsets account for 36 percent of the total covered emissions and 65 percent of the offsets used. These top offset users included Chevron (1.66 million offsets), Calpine Energy Services (1.55 million offsets), Tesoro (1.39 million offsets), SoCal Edison (1.04 million offsets), Shell (0.62 million offsets), PG&E (0.44 million offsets), Valero (0.43 million offsets), La Paloma Generating Company (0.40 million offsets), San Diego Gas & Electric (0.39 million offsets), and NRG Power (0.33 million offsets).

FIGURE 9
Total GHG Budget



^{*} Only emissions during 2013 and 2014 were subject to a compliance obligation. Estimates of comparable emissions during 2011 and 2012 were derived by summing the "emitter covered" and "electricity importer covered" emissions reported by regulated facilities for those years.



Decrease in 2014

allowance budget from

prior year

FIGURE 10
Offset Credits vs. Decrease in Allowance Cap

CONCLUSIONS

California's efforts to slow climate change by reducing GHG emissions can bring about additional significant co-benefits to health, particularly in disadvantaged communities. Preliminary analysis of the equity implications of California's cap-and-trade program indicates that regulated GHG-emitting facilities tend to be located in neighborhoods with higher proportions of residents of color and residents living in poverty. There is a correlation between emissions of GHGs and PM₁₀, and facilities that emit the highest levels of both GHGs and PM₁₀ are similarly more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity co-benefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged communities.

Offsets surrendered,

2013-14 compliance

period

Currently, there is little in the design of cap-and-trade to ensure this set of localized results. Indeed, while the cap-and-trade program has been in effect for a relatively short time period, preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were linked to offset projects located outside of California. Large GHG emitters that might be of most public health concern were the most likely to use offset projects to meet their obligations under the cap-and-trade program.

Further research is needed before firm policy conclusions can be drawn from this preliminary analysis. As regulated industries adapt to future reductions in the emissions cap, California is likely to see more reductions in localized GHG and co-pollutant emissions. Thus far, the state has achieved overall emissions reductions in large part by using offsets and replacing more GHG-intensive imported electricity with cleaner, in-state generation. Steeper in-state GHG reductions can be expected going forward if the use of offsets were to be restricted and the opportunity to reduce emissions by replacing imported electricity with in-state generation becomes exhausted.

However, ongoing evaluation of temporal and spatial trends in emissions reductions will be critical to assessing the impact of the cap-and-trade program. Several recommendations would strengthen future analyses and facilitate better tracking of the public health and environmental equity aspects of the cap-and-trade program going forward.

These include:

- Building better linkages between state facility-level databases on GHG and co-pollutant emissions.
 To conduct this preliminary analysis, we had to do a series of matches between datasets with
 different facility ID codes (see Appendix for details). Harmonization of facility ID codes between
 relevant data sources could be built into facility emissions reporting requirements going forward
 in order to facilitate analysis of temporal and spatial GHG and co-pollutant emissions trends.
- · Publicly releasing data on facility- and company-specific allowance allocations.
- Tracking and making data available on facility- and company-specific allowance trading patterns.

Good quality, publicly accessible data and robust analysis will be critical to informing policy discussions and improving regulatory implementation of California's climate law in ways that incentivize deeper instate GHG reductions and that achieve both sustainability and environmental equity goals.

ACKNOWLEDGEMENTS

We thank USC PERE Data Manager Justin Scoggins, Graduate Research Assistant Melody Ng, and Communications Specialist Gladys Malibiran for their assistance in the production of this brief; the California Environmental Justice Alliance for helpful feedback on an early version of this brief; and the Energy Foundation (grant number G-1507-23494), the Institute for New Economic Thinking (grant number INO1500008), and the Resources Legacy Fund for their support of this work.

Cover image credits:

Creative Commons licensed (CC BY 2.0) via Flickr.com - by haymarketrebel - https://flic.kr/p/9mnYHQ Creative Commons licensed (CC BY 2.0) via Flickr.com - by Sharon Rong - https://flic.kr/p/nAnQ2

APPENDIX

This appendix includes a description of the methods used in our preliminary environmental equity assessment of California's cap-and-trade program. We also present supplemental analyses, including a comparison of neighborhood demographics near regulated GHG facilities using different buffer distances to define proximity.

Methods

GREENHOUSE GAS EMISSIONS

To start, we downloaded annual, facility-specific GHG emissions data for 2011-2014 from the Mandatory Reporting of Greenhouse Gas Emissions (MRR) program.¹ The MRR includes self-reported estimates of annual emissions of greenhouse gases (GHGs)—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated GHGs-from regulated industries that have been verified by an independent third party. Emissions are given in units of CO2-equivalents, a metric that combines the quantity of individual gases emitted with the potency of each gas in terms of its contribution to climate change over a 100-year time frame (also known as "global warming potential"). Our analysis focused on one class of emissions included in this database called "emitter covered emissions," which corresponds to localized, in-state emissions resulting from "the combustion of fossil fuels, chemical and physical processes, vented emissions...and emissions from suppliers of carbon dioxide"11 as well as emissions of GHGs other than CO. from biogenic fuel combustion. The term "covered" refers to the fact that these emissions are subject to a compliance obligation under the cap-and-trade program; releases of CO2 that result from the combustion of biogenic fuels, for example, are exempted. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes); although we did not analyze distributed emissions in this report, this category of emissions will be a future research topic.

The number of facilities reporting to the MRR can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report. In our analysis of trends in emissions across industry sectors, we excluded facilities that did not report to the emissions inventory every year during 2011-14, as well as facilities that reported no emitter covered emissions during the four-year period. Facilities were categorized according to the sector reported in the MRR with slight modifications to reduce the number of categories. Facilities described as a refinery alone or in combination with any of the following were categorized as a refinery: hydrogen plant, CO₂ supplier, or transportation fuel supplier. Facilities described as "other combustion source" or "other combustion source" were categorized as "other."

We determined or confirmed the geographic location of each facility using a variety of data sources and methods. Geographic point locations for some facilities were obtained directly from the California Air Resources Board (CARB), and facility addresses reported in CARB's online GHG visualization tool were geocoded. ¹² We located some sites using individual internet searches. All locations inside California were visually confirmed, and point locations were adjusted for accuracy using aerial imagery in Google Earth Pro.

CO-POLLUTANT DATA (PM10)

We obtained emissions of criteria air pollutants from the California Emission Inventory Development and Reporting Systems (CEIDARS) database for years 2011-14.² Reporting requirements, including the way in which facilities are defined, the numeric identifier attached to each facility, and the frequency of reporting, differ between CEIDARS and the MRR GHG database. This presents a challenge for combining emissions estimates from the two sources. In particular, criteria air pollutants are not required to be reported annually, and emissions estimates contained in the 2014 CEIDARS database may correspond to estimates from prior years. We joined data on PM₁₀ emissions from the 2014 CEIDARS with GHG emissions information from the MRR GHG database based on the facility name, city, and ZIP code. For some GHG facilities listed in the MRR GHG database, we obtained addresses from CARB's Facility GHG Emissions Visualization and Analysis Tool. ¹² Since the CEIDARS database also contains addresses, we were able to use the address field to confirm and find additional matches. When all variables (facility name, city, and ZIP code) did not match between the two data sources, matches were confirmed by hand through internet searches of company websites and online databases containing facility names and addresses.

NEIGHBORHOOD DEMOGRAPHICS AND CUMULATIVE IMPACT

We defined neighborhoods on the basis of 2010 vintage Census block group boundaries provided by the U.S. Census. ¹³ Block group centroids were created by using the point-to-polygon tool in ArcGIS and the distance between block group centroids and GHG facility locations was calculated using the point-distance tool in ArcGIS (ESRI, Redlands, CA).

Demographic information for each block group was obtained from the 2014 5-year American Community Survey estimates. White individuals were defined as those who self-identified as white but not Hispanic. People of color were defined as all other individuals, including those who identified as multiracial or of Hispanic ethnicity. Poverty was defined as twice the federal poverty level (FPL) to reflect increases in the cost of living since the FPL was established and California's high cost of living.

CalEnviroScreen is a state-level screening tool developed by the California Environmental Protection Agency that helps identify California communities that are disproportionately burdened by multiple sources of pollution. It includes indicators of proximity to environmental hazards and population vulnerability to derive a relative score of cumulative environmental health impact. We assigned block groups the most recent CalEnviroScreen score of their census tract in order to compare CalEnviroScreen rankings near GHG facilities to the rest of the state. Figure 11 summarizes the construction of our facility-level dataset.

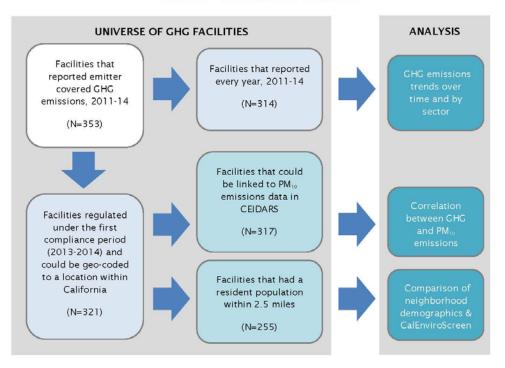


FIGURE 11 - Construction of the Dataset

ALLOWANCES AND OFFSETS

Unlike the emissions data, information on the allocation of allowances and ways in which regulated industries are complying with the cap-and-trade program is reported on an industry- and company-specific basis, rather than at the facility level. One company may own several regulated facilities. Information on the allocation of allowances was compiled from the California Code of Regulations (17 CA ADC § 95841 and 17 CCR § 95870) and CARB publications on the public allocation of allowances and estimates of state-owned allowances. ¹⁵ We obtained the number of allowances and offsets surrendered by each company at the completion of the first compliance period from CARB's 2013-14 Compliance Report. ¹⁶ Information on individual offset projects was compiled from CARB documents on offsets issued as of August 10, 2016 ¹⁷ and individual project descriptions provided in the American Carbon Registry and Climate Action Reserve carbon offset registries. ¹⁸

Supplemental Analyses

Consistent with the findings presented in Table 1 in the main text, Table 3 shows that neighborhoods within 1.5 miles of a facility with localized GHG emissions have a 16 percent higher proportion of residents of color, a 26 percent higher proportion of residents living in poverty, and a higher likelihood of scoring among the worst statewide in terms of their CalEnviroScreen score than neighborhoods that are not within 1.5 miles of such a facility. Table 4 and Table 5 show similar trends when neighborhoods up to a larger distance of 3.5 and 6 miles away are considered. These results confirm that the findings presented in our main analysis were not sensitive to our choice of buffer distance.

TABLE 3
Characteristics of Neighborhoods within 1.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 1.5 miles (N=2,710)	Block groups with no facilities within 1.5 miles (N=20,392)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	44%	35%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	20%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	36%	18%

TABLE 4
Characteristics of Neighborhoods within 3.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 3.5 miles (N=9,991)	Block groups with no facilities within 3.5 miles (N=13,111)
Mean % People of Color	66%	51%
Mean % People Living Below Twice the Poverty Level	39%	33%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	15%	6%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	29%	13%

TABLE 5
Characteristics of Neighborhoods within 6 miles of GHG-emitting Facilities (N=255 facilities)

Block groups with at least one facility within 6 miles (N=16,365)	Block groups with no facilities within 6 miles (N=6,737)
65%	41%
37%	32%
13%	3%
25%	7%
	one facility within 6 miles (N=16,365) 65% 37%

In the main text, we defined the 66 largest GHG and PM_{10} emitting facilities as those that were within the top third in terms of their 2014 emissions of both PM_{10} and localized GHGs, and highlighted them in orange in Figure 2. We found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6).

TABLE 6
Characteristics of Neighborhoods near top GHG- and PM₁₀-Emitting Facilities that Increased and Decreased GHG Emissions (N=66 facilities¹⁹)

	Block groups within 2.5 miles of at least one top emitting facility that increased GHG emissions (N=675)	Block groups within 2.5 miles of at least one top emitting facility that decreased GHG emissions (N=669)
Mean % People of Color	74%	58%
Mean % People Living Below Twice the Poverty Level	46%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	25%	14%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	46%	28%

ENDNOTES

- ¹ Mandatory Reporting of Greenhouse Gas Emissions (MRR), http://www.arb.ca.gov/cc/reporting/ghg-rep/reporteddata/ghg-reports.htm.
- CEIDARS, http://www.arb.ca.gov/ei/disclaim.htm; http://www.arb.ca.gov/ei/drei/maintain/dbstruct.htm.
- OHC facilities were limited to those that report emitter covered emissions during the first compliance period of capand-trade (2013-14), could be geo-coded in California, and had a resident population within 2.5 miles (N=255). We define neighborhoods using Census block groups. Residential proximity to a GHG facility was based on the distance between the facility location and each block group's centroid. We chose a 2.5 mile distance due to its common use in
- other environmental justice analyses. The Appendix gives results using alternative distance buffers.

 * For calculations in Table 1, we used the universe of block groups for which there are valid data (i.e., non-missing data) for all four measures shown. However, the results were the same when we included all block groups with valid data for each measure on an individual basis.
- ⁵ The map in Figure 1 shows 66 additional facilities that are not included in Table 1 and Figure 2 because they are not
- within 2.5 miles of a block group centroid with a resident population. See Figure 11 in the Appendix for details.

 Because there are several PM_{10} values that are between zero and one metric ton, in Figure 3 we added 1 to the PM_{10} value for all facilities prior to taking the log10 to avoid reporting negative values
- Similar to Table 1, for calculations in Table 2, we used the universe of block groups for which there are valid data (i.e., non-missing data) for all four measures shown. However, the results were the same when we include all block groups with valid data for each measure on an individual basis.
- ⁸ The results were qualitatively similar when we compared 2014 emissions to 2012 emissions. That is, the median and mean for each industry sector were in the same direction as shown in Figure 4 (above, near, or below zero), with one major exception: electricity generators on average decreased their emitter covered emissions in 2014 relative to 2012. California GHG Emission Inventory, 2016 Edition,

http://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/qhg_inventory_trends_00-14_20160617.pdf

- ¹⁰ Some have critiqued the appropriateness of forestry projects for carbon offset purposes. For example, tree planting projects can take decades to reach maturity in terms of their ability to sequester carbon. Younger trees sequester less carbon and often take decades to fully mature. Moreover, it is challenging to measure and quantify the ability of forestry projects to sequester carbon over time. In particular, the permanence of forestry projects cannot be guaranteed as they remain susceptible to fire, disease, natural decay, clearing, or mismanagement. Forestry projects are also vulnerable to "leakage." This refers to the fact that, unless global demand for wood products goes down, a reduction in logging in one location can simply result in greater deforestation in another location.
- (See http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=0 and http://www.web.uvic.ca/~repa/publications/REPA%20working%20papers/WorkingPaper2007-02.pdf for overviews of these issues.)
- https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2014-ghg-emissions-2015-11-04.xlsx
- http://www.arb.ca.gov/ei/tools/qhg_visualization/ https://www.census.gov/geo/maps-data/data/cbf/cbf_blkgrp.html
- http://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20
- http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/publicallocation.htm;
- http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-ng-allowancedistribution/electricity-allocation.pdf; http://www.arb.ca.gov/cc/capandtrade/stateauction.htm
- http://www.arb.ca.gov/cc/capandtrade/2013-2014compliancereport.xlsx
- http://www.arb.ca.gov/cc/capandtrade/offsets/issuance/arb_offset_credit_issuance_table.pdf
- http://americancarbonregistry.org; http://www.climateactionreserve.org
- 66 GHG facilities fell in the top third in terms of both PM₁₀ and localized GHG emissions. We found that 40 of these facilities increased localized GHG emissions, 23 decreased emissions, and three did not report to the database all four years (2011-2014) so we could not determine an increase or decrease.

Letter 123



Comment Log Display

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.

COMMENT 123 FOR SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET AND DRAFT ENVIRONMENTAL ANALYSIS (SCOPINGPLAN2030) - NON-REG.

First Name: Mike Last Name: Bullock

Email Address: mike_bullock@earthlink.net

Affiliation:

Subject: Scoping Plan Update

Comment:

Dear CARB Members and Staff,

Scope of Document:

I am disappointed in the reduction in scope, from the First Update to the Climate Change Scoping Plan, Building on the Framework, ("Update"), which included a section titled "Climate Stabilization". The reduction in scope is clear from the subtitle of this document: "The Proposed Strategy for achieving California's 2030 Greenhouse Gas Target." Your are therefore assuming, without being clear, that the California climate mandate is climate stabilizing. There are good reasons to believe it is not. Recently it was stated that starting in 2020, emissions must be cut in half each decade. This would mean that 2030 emissions must be 50% less than in 2020; not 40% less. The last Scoping Update faced the crises squarely in it section on Climate Stabilization. This proposal covers all of that up by pretending we know the SB 32 target is all we need to worry about.

Since the state-policy direction that is defined in this document will have an impact on environmental outcomes, this document is therefore a project under CEQA law. CEQA requires an analysis of the environmental impacts in the physical world, not just whether or not targets set by a law are achieved. Therefore, this document must do much more than just proposing a strategy to achieve California's 2030 greenhouse gas target. An accurate assessment of humanity's situation shows that we must achieve climate-stabilizing targets and that furthermore, measures that go beyond this must also be implemented. Given our dire situation, it is easy to see

123-

that all proposed greenhouse gas (GHG) reduction measures that are technologically feasible and cost effective must be adopted. Limiting the scope to one which might fail to stabilize the climate at a livable level is unacceptable, for many reasons, including that it will violate CEQA.

Crisis Description

On Page ES2, you use the oft-used expressions, "worst-case scenarios" and (stave off the) "most severe impacts". However, the CARB members, who are the decision-makers in this case, deserve a more straightforward description of what is at stake. Governor Brown provided this in his comments to the Pope, which he understood would be quoted all over the world. He said these five simple words: "humanity must reverse course or face extinction."

As important as that statement is, it was preceded by an equally important set of words, "the world may already have "gone over the edge" on global warming." We trust that you understand exactly what that statement means. It may be too late to avoid destabilization.

We appreciate the information you have provided about the various environmental degradations we will experience, such as sea-level rise, on our path to the loss of most forms of life on the planet; or perhaps it will be on the path to nearly losing most life forms on the planet. However, nowhere do you state the simple truth that we are headed towards a devastating collapse of the human population and that it may be too late to prevent this from happening. The Board deserves to know this. The general public deserves to know this.

Target Setting

The current draft says the following:

" 2. Setting the 2030 Statewide Target

The 2030 target set by SB 32 of 40 percent reduction from 1990 levels by 2030 reflects the same science that informs the agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (IPCC), aimed at keeping the global temperature increase below 2 degrees Celsius (°C). The California 2030 statewide target represents the most ambitious GHG reduction goal for North America. Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 MMTCO2e."

However, that approach is contradicted by your own, "Update", when it says the following:

"B. Achieving Climate Stabilization Scientific research indicates that an increase in the global average temperature of 2°C (3.6°F) above pre-industrial levels, which is only 1.1°C (2.0°F) above present levels, poses severe risks to natural systems and human health and well-being. Considering knowledge from the paleo-climate record with changes currently observed in the Greenland and Antarctic ice sheets, we can expect substantial sea level rise, 0.4 to 0.8 meters, with upper end uncertainties approaching one meter above present day during the 21st Century and continued substantial increase after 2100 even with stringent mitigation of emissions to achieve 2°C stabilization. Increased climate extremes, already apparent at present day climate warming (~0.9°C), will no doubt be more severe. To have a good chance (not a guarantee) of avoiding temperatures above those levels, studies focused on a goal of stabilizing the concentration of heat-trapping gases in the atmosphere at or below the 450 parts per million (ppm) CO2-equivalent (CO2e, a metric that combines the climate impact of all well-mixed GHGs, such as methane and nitrous oxide, in terms of CO2).

The CO2e target is a somewhat approximate threshold, and the exact level of CO2e is not precisely known because the sensitivity of the climate system to GHGs has uncertainty. Different models show slightly different outcomes within this range. An example of a pre-IPCC assessment study (Meinshausen et al. 2009)15 which has synthesized many studies on climate sensitivities, concluded that we would need to stabilize at about 400 ppm CO2e in order to likely avoid exceeding the 2°C threshold (even at that stabilization target, there is still about a 20 percent chance of exceeding the temperature target). Further, a recent paper by an international team of scientists (Hansen et al. 2013)16 asserts that the widely accepted target of limiting human-made global climate warming to 2°C above preindustrial levels is likely too high and may subject future generations and nature to irreparable harm. Recognizing this fact, the international community agreed in meetings in Cancun in 2012 to review, by 2015, progress to the 2°C target and consider whether it should be strengthened to a 1.5°C threshold."

The first key statement, taken from those words, is the following, with emphasis added:

"An example of a pre-IPCC assessment study (Meinshausen et al. 2009)15 which has synthesized many studies on climate sensitivities, concluded that we would need to stabilize at about 400 ppm CO2e in order to likely avoid exceeding the 2°C threshold (even at that stabilization target, there is still about a 20 percent chance of exceeding the temperature target)."

Of course the problem is that we have already exceeded 400 PPM.

The second key statement is this, again with emphasis added:

"Further, a recent paper by an international team of scientists (Hansen et al. 2013) asserts that the widely accepted target of limiting human-made global climate warming to 2°C above preindustrial levels is likely too high and may subject future

generations and nature to irreparable harm."

Given that we may already be going over 2 degrees Celsius and that we should not be going over 1.5 degree Celsius, and based on some of my own independent analysis, I believe that the 2030 target should probably be 80% (not 40%) below the 1990 level by 2030. This is equivalent to saying the Governor's Executive Order S-3-05 target, for year 2050, needs to be achieved 20 years sooner. If you believe that the SB 32 target is climate-stabilizing, in the sense that if it was achieved by the entire industrial world then planet earth would not experience climate destabilization; then that needs to be stated, along with your reasoning as to why the key statements I have just presented, from the Update, can be ignored.

SB 375 Targets

As part of this scoping plan, CARB needs to develop a set of enforceable measures that will cause cars and light-duty trucks (LDVs, the SB 375 emitters) to achieve climate-stabilizing targets. This special treatment for LDVs is warranted by the amount of GHG they emit and the complex nature of the inherent trade-off between fleet efficiency and per-capita driving.

From the 2016 California Democratic Party (CDP) Platform:

 Demand Regional Transportation Plan driving-reduction targets, shown by science to support climate stabilization

To do that, the target-year, fleet efficiency must be known. The California Democratic Party understands this, as shown by the following, also from the 2016 California Democratic Party (CDP) Platform:

- Demand a state plan showing how cars and light-duty trucks can hit climate-stabilizing targets, by defining enforceable measures to achieve the needed
- fleet efficiency and
- per-capita driving.

I have attached a plan that does exactly that. It was peer-reviewed by the Air and Waste Management Association. It would serve as an example that could help you prepare such a plan.

Under CEQA, you have a responsibility to have such plan, as part of this Scoping Plan effort. That way, the Board Members can decide if they want to vote approval of a plan that would achieve a climate-stabilizing target. Furthermore, CARB should assign SB 375 targets to the MPOs that support such a plan. The target assignment is critically important and is also a project under CEQA. It has been said, and I believe that it is true, that having no plan to succeed is actually having a plan to fail. Failing will, considering this under CEQA law (cumulative effects), result in the loss of most life forms on our planet, including our own species.

The assigning of targets is a discretionary project under CEQA and so you must follow CEQA law in assigning SB 375 targets.

By the way, for the most part, our extinction will be brought about by a loss of habitat, meaning that we will starve to death.

Low-income citizens will starve first; billionaires will starve last. Loss of most life forms on the planet is a very severe environmental impact. Some would say it is unacceptable.

LDVs and Enforceable Measures to Achieve the Needed Driving Reduction

I appreciate your Section IV-C, Transportation Sustainability. I have made a case for your preparing a plan showing how cars and light-duty trucks (LDVs) can achieve climate-stabilizing targets. Your Section IV-C makes the point that making the needed changes will provide significant improvements in health. I also support your call for "the integration of electrified rail and transit to improve reliability and travel times, increase active transportation such as walking and bicycling, encourage use of streets for multiple modes of transportation, improve freight efficiency and infrastructure development, and shift demand to low carbon modes".

All categories of transportation will have to achieve the needed GHG reductions.

However, I must stand firm on my request for a specific LDV plan, to ensure success for the biggest GHG-emitting category. My understanding matches yours when you state the following:

"VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan."

And also:

"Stronger SB 375 GHG reduction targets will enable the State to make significant progress"

Again, all of this will be made clear with an LDV plan, which will quantify this and, most importantly, identify the specific enforceable measures. For example, the one such plan I know of proposes keeping the Corporate Average Fuel Efficiency (CAFÉ) standards, but having them only apply to internal combustion engine (ICE) LDVs. Then, in addition to the CAFÉ standard for ICEs, car manufacturers would need to sell a specified fraction of ZEV vehicles. Such a scheme would need to also allow buying credits from a company that is able to exceed the specified fraction, such as Tesla. Some manufacturers may want to continue to focus on the ICE market. However, the ICE market would, by law, dwindle down to be quite small by 2025 or so. It is important to provide clarity to the manufacturers of LDVs.

A plan for LDVs would need to develop a set of enforceable measures to reduce driving. The following sections show some of the primary enforceable measures, along with estimates for the reduction in per-capita driving they would achieve, from the SB 375 base year of 2005 to the target year of 2030.

1.) Reallocate Funds Earmarked for Highway Expansion to Transit and Consider Transit-Design Upgrades (3%)

For example, San Diego County has a sales tax measure called "TransNet", which allocates one-third for highway expansion, one-third for transit, and one-third for road maintenance. It has a provision that allows for a reallocation of funds, if supported by at least two-thirds of SANDAG Board members, including a so-called weighted vote, where governments are given a portion of 100 votes, proportional to their population. This enforceable measure is to direct SANDAG to reallocate its TransNet amount, earmarked for highway expansion, to transit and to order similar reallocations throughout California.

This money could be used to fund additional transit systems; fund improved transit operations; and/or fund the redesign and implementation of that redesign of existing transit systems. The redesign could include electrification and automation or even upgrading to a completely different technology.

2.) A Comprehensive Road-Use Fee Pricing, Collection, and Payout System to Unbundle the Cost of Operating Roads (7.5%)

Comprehensive means that pricing would be set to cover all costs (including road maintenance and externalities such as harm to the environment and health); that privacy and the interests of low-income drivers doing necessary driving would be protected; that the incentive to drive fuel-efficient cars would be at least as large as it is under the current fuels excise tax; and, as good technology becomes available, that congestion pricing is implemented to protect critical driving from congestion.

The words "payout" and "unbundle" mean that some of the money collected would go to people that are losing money under the current system. For example, the estimate of increased health cost due to LDV-caused air pollution would be the basis for a transfer of funds to reduce health-care costs.

User fees (gas taxes and tolls) are not enough to cover road costs and California is not properly maintaining its roads. Besides this, the improved mileage of the ICEs and the large number of ZEVs needed mean that gas tax revenues will drop precipitously.

This system could probably be implemented in less than 5 years and efforts should start now and make use of the data generated by the soon-completing Road Use Charge (RUC) pilot project that was

implemented under SB 1077.

3.) Either Literally, or More Commonly, Effectively, Unbundle the Cost of Car Parking (7.5%)

Unbundling or, effectively unbundling, the cost of car parking throughout California is conservatively estimated to decrease driving by 7.5%. "Effectively unbundling parking" means installing a pricing, collection, and payout system that removes 100% of the unfairness and environmental harm of bundling the cost (at apartments, stores, or rail stations, for example) or of bundling the benefit (at work or schools, for example) of parking. It should be noted that parking is often very expensive to provide and people pay for its use in hidden ways, such as receiving a reduced wage, paying an increased rent or paying an increased cost. These financial burdens are generally invisible, inescapable, and even apply to those citizens who never drive or park a car.

Regarding car parking at work, we cite a CEQA lawsuit against the County of San Diego's Climate Action Plan (CAP). The lawsuit resulted in a published Appellate Court ruling, thereby establishing the legal precedent that CAPs must have meaningful targets, enforceable measures, and must not ignore feasible mitigations that have been proposed. However, to this day, San Diego County, at their downtown office building, which is located near to good transit, and some of the most expensive real estate in the world, provides "free" parking to its employees. The lawsuit proposed a mitigation measure to operate the employee parking as a business for the financial gain of the County employees. The following description is of a system that was found to be feasible mitigation in the CEQA lawsuit against the County of San Diego's CAP:

The municipality would develop a Demonstration Project to Unbundle the Cost of Parking ("Demonstration Project") at a city employee location ("Proposed Location").

The municipality would (assuming the demonstration project was successful) unbundle the cost of the parking at all municipal buildings.

BACKGROUND: Currently, municipal employees do not have the ability to choose between earnings and driving — employees effectively pay for parking out of their salary, whether or not they use the parking. The Demonstration Project will provide the opportunity for the employees to choose between earnings and driving. This implements the California Air Pollution Control Officers Association (CAPCOA) measure of unbundling the cost of parking.

PROJECT: Parking would be charged at a given rate (for example \$0.02/min - roughly \$9.60/day). Funds generated from these parking charges would be distributed as earnings to all employees working at the proposed location in proportion to each employee's time

spent at work, at the proposed location. Those who decide not to drive will not be charged for parking but will still make earnings based on time spent at work at the location. Implemented correctly, this free market approach will substantially reduce vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions, by reducing the drive-alone mode.

For employees whose parking charges are greater than parking lot earnings, an "add-in" may be included so that no employee loses money, compared to "free parking". With such "add-in" payments, there could be an "Opt in or Opt out" choice, meaning that those that "Opt out" will see no changes on their pay check, relative to "free parking".

This project may be helped by receiving a grant to pay the development and installation cost, as well as the "add in" payments, for some specified number of years. The municipality would need to apply for such a grant.

The County was ordered to rescind their Climate Action Plan and pay all legal fees. They are currently without a Climate Action Plan. However, we still do not know if they will implement the car-parking measure that was found to be feasible. All of the municipal governments in California would benefit if CARB took the initiative on this mitigation measure.

Please start a process to design and implement such a plan, for your own employees, at a site where the parking is currently operated as a bundled benefit (AKA, "free".) We could provide the contact information of a vendor who would be happy to do this work.

There is political support and awareness of the need for such a system and for transportation reform in general. For example, the following is from the 2016 CDP Platform:

- o Work for equitable and environmentally-sound road and parking operations; Support strategies to reduce driving, such as smart growth, "complete streets"; teaching bicycling traffic skills; and improving transit, from local systems to high speed rail
- o Work for shared, convenient and value-priced parking, operated with a system that provides earnings to those paying higher costs or getting a reduced wage, due to the cost of providing the parking;
- Good Bicycle Projects and Bicycle Traffic Skills Education (3%)

The best criterion for spending money for bicycle transportation is the estimated reduction in driving per the amount spent. The following strategies may come close to maximizing this parameter.

a.) Projects to Improve Bicycle Access

All of the smart-growth neighborhoods, central business districts, and other high-trip destinations or origins, both existing and planned, should be checked to see if bicycle access could be substantially improved with either a traffic calming project, a "complete streets" project, more shoulder width, or a project to overcome some natural or made-made obstacle.

b.) League of American Bicyclist Certified Instruction of "Traffic Skills 101"

Most serious injuries to bike riders occur in accidents that do not involve a motor vehicle. Most car-bike accidents are caused by wrong-way riding and errors in intersections; the clear-cut-hit-from-behind accident is rare.

After attending Traffic Skills 101, students that pass a rigorous written test and demonstrate proficiency in riding in traffic and other challenging conditions could be paid for their time and effort.

As an example of what could be done in San Diego County, if the average class size was 3 riders per instructor and each rider passes both tests and earns \$100 and if the instructor, with overhead, costs \$500 dollars, for a total of \$800 for each 3 students, that would mean that \$160M could teach \$160M/\$800 = 200,000 classes of 3 students, for a total of 600,000 students. The population of San Diego County is around 3 million.

5.) Eliminate or Greatly Increase the Maximum Height and Density Limits Close to Transit Stops that Meet Appropriate Service Standards (2%)

As sprawl is reduced, more compact, transit-oriented development (TOD) will need to be built. This strategy will incentivize a consideration of what level of transit service will be needed, how it can be achieved, and what levels of maximum height and density are appropriate. Having no limits at all is reasonable if mathematical models show that the development can function without harming the existing adjacent neighborhoods, given the level of transit service and other supporting transportation policies (such as car parking that effectively unbundles the cost or benefit of parking and furthermore supports the full sharing of parking) that can be assumed.

6.) Improve the Way We Pay for the Use of Transit

Eventually, using transit, car parking, and roads should be no different than using water or electricity. This will require a new design. To show an example of how this could be described and as an example showing that people that have become educated on the topic of climate and transportation are ready for change, the following

is provided as a resolution that will be submitted to the California Democratic Party. The Democratic Club of Carlsbad and Oceanside has already passed a nearly-identical resolution.

Support for the Development and Installation of a Single System to Operate Roads, Car-Parking, and Transit

WHEREAS, (1) greenhouse gas (GHG) emissions must be reduced; (2) about 35% of California's GHG is caused by driving; (3) given reasonable estimates for future fleet efficiency, to achieve climate-stabilization targets, driving must be reduced; and (4) the second bullet of the Transportation Sub-plank of the 2016 CDP Platform calls for "equitable and environmentally-sound road and parking operations"; and

WHEREAS, in California, (1) user fees (gas tax and/or tolls) do not cover the cost of road maintenance; (2) our fleet must combust less fuel each year, thereby reducing gas-tax revenue yearly; (3) hiding the true cost of road use increases driving, air pollution, congestion, propensity to approve sprawl development, and GHG emissions; (4) a 2011 California Transportation Commission assessment found 58 percent of our roads needing rehabilitation or maintenance; (5) prevailing-wage construction jobs are needed; and (6) there is a current state pilot project for a Road Usage Charge (RUC) but no legislation to implement a RUC and no RUC system design;

WHEREAS, (1) bundled-cost parking ("bundled-cost" denotes that the parking is offered at no charge because its cost is "bundled" into the cost of other items) increases the cost of everything, from rent to food; (2) bundled-benefit parking ("bundled-benefit" denotes that it is an employee benefit, like a salary, or a medical benefit) reduces wages; (3) the fourth bullet of the Transportation Sub-plank of the 2016 CDP Platform calls for "shared, convenient and value-priced parking, operated with a system that provides earnings to those paying higher costs or getting a reduced wage, due to the cost of providing the parking"; and (4) technology could increase the convenience of paying for driving, parking, and using transit and distributing earnings, taken from these revenue streams, to individuals, as appropriate;

THEREFORE, BE IT RESOLVED, that the California Democratic Party supports a transit-use, road-use, and car-parking-use pricing, collection, and payout system, operated with modern technology and specified by a system-requirements document (such a document unambiguously defines what the system does, as the first step of system design), covering such topics as privacy, protection for low-income users, base-and-congestion price, detection, and statement-mail-out methods, always assuming prevailing-wage jobs.

BE IT FURTHER RESOLVED, that this support be communicated to Governor Edmund G. Brown, Senate Pro-Tem Kevin de Leon, Speaker Anthony Rendon, the Air Resources Board, and the California

Transportation Commission.

In conclusion, we need enforceable measures that will reduce driving by reforming our transportation systems. The estimates of the driving reductions that will result from these measures will need to add up to the total needed, given the target-year fleet efficiency and the climate-stabilizing target.

Thank you for your leadership,

Mike Bullock 760-754-8025

Attachment: www.arb.ca.gov/lists/com-attach/146-scopingplan2030-WzdXNQF2UFwDdwRh.docx

Original File Name: LDV_RequirmentsToAchieveNeededTargets3.docx

Date and Time Comment Was Submitted: 2017-04-10 13:42:36

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

Climate-Stabilizing, California Light-Duty Vehicle Requirements, Versus Air Resource Board Goals

Paper 881

Mike R. Bullock

Retired Satellite Systems Engineer, 1800 Bayberry Drive, Oceanside, CA 92054

ABSTRACT

An Introduction is provided, including the importance of light-duty vehicles (LDVs: cars and light duty trucks) and a definition of the top-level LDV requirements to limit their carbon dioxide ("CO2") emissions.

Anthropogenic climate change fundamentals are presented, including its cause, its potential for harm, California mandates, and a greenhouse gas (GHG) reduction road map to avoid disaster.

A 2030 climate-stabilizing GHG reduction target value is calculated, using statements by climate experts. The formula for GHG emissions, as a function of per-capita driving, population, fleet CO2 emissions per mile, and the applicable low-carbon fuel standard (LCFS) is given. The ratio of the 2015 value of car-emission-per-mile to the 2005 value of car-emission-per-mile is obtained.

Internal Combustion Engine (ICE) mileage values from 2000 to 2030 are identified, as either mandates or new requirements. A table is presented that estimates 2015 LDV fleet mileage.

Zero Emission Vehicle (ZEV) parameters are given. A table is shown that uses 2030 ZEV and ICE (ICE LDVs) requirements, named the "Heroic Measures" case, to compute the LDV fleet-equivalent mileage. That equivalent fleet mileage is used, with population and the required emission reduction, to compute a required per-capita driving reduction, with respect to 2005. Measures to achieve this percapita driving reduction are described, with reductions allocated to each measure. The energy used per year for the Heroic Measures case is estimated

The "Heroic Measures" set of fractions of ZEV's purchased, as a function of year, is compared to the California Air Resources Board (CARB) goals.

INTRODUCTION

Within the context of working the anthropogenic-climate-change problem and from a systems engineering perspective, the top-level requirement is to reduce greenhouse gas (GHG) emissions enough to support stabilizing our climate at a livable level. This top-level requirement must flow down to the subsystem of LDVs, especially due to the magnitude of their emissions. (As an example, LDVs emit 41% of the GHG in San Diego County¹.)

More specifically, LDV requirements will be identified that, taken together, will result in GHG emission reductions sufficient to "support climate stabilization". "Support climate stabilization"

means that the LDV emission level will be equal to a climate-stabilizing target. Such a target is expressed as an emission level in some target year. The target is based on climate science.

From a systems engineering perspective, at the top level, the needed LDV requirements are

- LDV fleet efficiency, meaning the greenhouse gas (GHG) emissions per mile driven, applicable to the entire fleet, on the road in the year of interest and
- an upper bound on per-capita driving, given the derived fleet efficiency and the predicted population growth.

The fleet efficiency requirement will be developed as a function of lower-level requirements, such as Corporate Average Fuel Efficiency (CAFÉ) requirements, requirements on how fast Battery Electric Vehicles (BEVs) must be added into the fleet each year, and requirements to get low-efficiency vehicles off the roads. The second top-level requirement, the upper bound on percapita driving, will spawn transportation-system requirements designed to result in less driving, such as better mass transit. This paper will derive a formulae to compute the required per-capita driving levels, based on fleet efficiency, predicted population growth, and the latest, science-based, climate-stabilizing GHG emission target.

In this work, three categories of LDV emission-reduction strategies will be considered: cleaner cars, cleaner fuels, and less driving.

BACKGROUND: OUR ANTHROPOGENIC CLIMATE CHANGE PROBLEM

Purpose of This Section

Before going to work to solve a systems-engineering problem, it is important to understand the nature of the problem. How complex is the problem? How much is at stake if the problem is not solved? Is it reasonable to take a chance and only solve the problem with a reasonably high probability or is there too much at stake to gamble? This section is an attempt to answer these questions.

Basic Cause

Anthropogenic climate change is driven by these two processes²: First, our combustion of fossil fuels is adding "great quantities" of CO₂ into our atmosphere. Second, that additional atmospheric CO₂ is trapping additional heat.

California's First Three Climate Mandates

California's Governor's Executive Order S-3-05³ is similar to the Kyoto Agreement and is based on the greenhouse gas (GHG) reductions that were recommended by climate scientists for industrialized nations back in 2005. In 2005, many climate scientists believed that the reduction-targets of S-3-05 would be sufficient to support stabilizing Earth's climate at a livable level, with a reasonably high level of certainty. More specifically, this executive order aims for an average, over-the-year, atmospheric temperature rise of "only" 2 degree Celsius, above the preindustrial temperature. It attempts to do this by limiting our earth's level of atmospheric CO₂ e to 450 PPM by 2050 and then reducing emissions further, so that atmospheric levels would come down

to more tolerable levels in subsequent years. The S-3-05 emission targets are 2000 emission levels by 2010, 1990 levels by 2020, and 80% below 1990 levels by 2050.

It was thought that if the world achieved S-3-05, there might be a 50% chance that the maximum temperature rise will be less than 2 degrees Celsius, thus leaving a 50% chance that it would be larger than 2 degrees Celsius. A 2 degree increase would put over a billion people on the planet into a condition described as "water stress" and it would mean a loss of 97% of the earth's coral reefs.

There would also be a 30% chance that the temperature increase would be greater than 3 degrees Celsius. A temperature change of 3 degree Celsius is described in Reference 3 as being "exponentially worse" than a 2 degree Celsius increase.

The second California climate mandate is AB 32, the *Global Warming Solutions Act of 2006*. It includes provisions for a cap and trade program, to ensure meeting S-3-05's 2020 target of the 1990 level of emissions. It continues after 2020. AB 32 requires CARB to always implement measures that achieve the maximum *technologically feasible and cost-effective* (words taken from AB 32) greenhouse-gas-emission reductions.

In 2015 Governor Brown signed Executive Order B-30-15. This Executive Order established a mandate to achieve an emission level of 40% below 2020 emissions by 2030, as can be seen by a Google search. If Executive Order S-3-05 is interpreted as a straight line between its 2020 target and its 2050 target, then the B-30-15 target of 2030 is the same as S-3-05's implied target of 2035, because 2035 is halfway between 2020 and 2050 and 40% down is halfway to 80% down.

California is on track to achieve its S-3-05 second (2020) target. However, the world emission levels have, for most years, been increasing, contrary to the S-3-05 trajectory. In part because the world has been consistently failing to follow S-3-05's 2010-to-2020 trajectory, if California is still interested in leading the way to stabilizing the climate at a livable level, it must do far better than S-3-05, going forward, as will be shown.

Failing to Achieve these Climate Mandates

What could happen if we fail to achieve S-3-05, AB 32, and B-30-15 or if we achieve them but they turn out to be too little too late and other states and countries follow our example?

It has been written that, "A recent string of reports from impeccable mainstream institutions-the International Energy Agency, the World Bank, the accounting firm of PricewaterhouseCoopershave warned that the Earth is on a trajectory to warm by at least 4 Degrees Celsius and that this would be incompatible with continued human survival."

It has also been written⁵ that, "Lags in the replacement of fossil-fuel use by clean energy use have put the world on a pace for 6 degree Celsius by the end of this century. Such a large temperature rise occurred 250 million years ago and extinguished 90 percent of the life on Earth. The current rise is of the same magnitude but is occurring faster."

Pictures That Are Worth a Thousand Words

Figure 1 shows (1) atmospheric CO₂ (in blue) and (2) averaged-over-a-year-then-averaged-over-the surface-of-the-earth world atmospheric temperature (in red). This temperature is with respect to a recent preindustrial value. The data starts 800,000 years ago. It shows that the current value of atmospheric CO₂, which is now over 400 PPM, far exceeds the values of the last 800,000 years. It also shows that we should expect the corresponding temperature to eventually be about 12 or 13 degrees above preindustrial temperatures. This would bring about a human disaster^{3,4,5}.

Figure 2 shows the average yearly temperature with respect to the 1960-to-1990 baseline temperature (in blue). It also shows atmospheric levels of CO₂ (in red). The S-3-05 goal of 450 PPM is literally "off the chart", in Figure 2. Figure 2 shows that, as expected, temperatures are starting to rise along with the increasing levels of CO₂. The large variations in temperature are primarily due to the random nature of the amount of solar energy being received by the earth.

FURTHER BACKGROUND: CALIFORNIA'S SB 375 AND AN IMPORTANT DATA SET

As shown in the Introduction, LDVs emit significant amounts of CO₂. The question arises: will driving need to be reduced or can cleaner cars and cleaner fuels arrive in time to avoid such behavioral change? Steve Winkelman, of the Center for Clean Air Policy (CCAP), worked on this problem.

SB 375, the Sustainable Communities and Climate Protection Act of 2008

Under SB 375, the California Air Resources Board (CARB) has given each Metropolitan Planning Organization (MPO) in California driving-reduction targets, for the years 2020 and 2035. "Driving" means yearly, per capita, vehicle miles travelled (VMT), by LDVs, with respect to 2005. The CARB-provided values are shown at this Wikipedia link, http://en.wikipedia.org/wiki/SB-375. It is important to note that although this link and many other sources show the targets to be "GHG" and not "VMT", SB 375 clearly states that the reductions are to be the result of the MPO's Regional Transportation Plan (RTP), or, more specifically, the Sustainable Communities Strategy (SCS) portion of the RTP. Nothing in the SCS will improve average mileage. That will be done by the state and federal government by their Corporate Average Fleet Efficiency (CAFÉ) standards. The SCS can only reduce GHG by reducing VMT. The only way an SCS can reduce GHG by 12%, for example, is to reduce VMT by 12%.

Under SB 375, every Regional Transportation Plan (RTP) must include a section called a Sustainable Communities Strategy (SCS). The SCS must include driving reduction predictions corresponding to the CARB targets. Each SCS must include only *feasible* transportation, land use, and transportation-related policy data. If the SCS driving-reduction predictions fail to meet the CARB-provided targets, the MPO must prepare an Alternative Planning Strategy (APS). An APS uses *infeasible* transportation, land use, and transportation-related policy assumptions. The total reductions, resulting from both the SCS and the APS, must at least meet the CARB-provided targets.

Critical Data: Useful Factors from Steve Winkelman's Data

Figure 3⁶.shows 6 variables as a percent of its 2005 value. The year 2005 is the baseline year of SB 375. The red line is the Caltrans prediction of VMT. The purple line is California's current mandate for a Low Carbon Fuel Standard (LCFS). As shown, by 2020, fuel in California must emit 10% less per gallon than in 2005. The turquoise line is the 1990 GHG emission in California. As shown, it is 12% below the 2005 level. This is important because S-3-05 specifies that in 2020, state GHG emission levels must be at the 1990 level. The green line is the C02 emitted per mile, as specified by AB 1493, also known as "Pavley 1 and 2" named after Senator Fran Pavley. The values shown do not account for the LCFS. The yellow (or gold) line is the S-3-05 mandate, referenced to 2005 emission levels. The blue line is the product of the red, the purple, and the green line and is the percentage of GHG emissions compared to 2005. Since VMT is not being adequately controlled, the blue line is not achieving the S-3-05 line. Figure 3 shows that driving must be reduced. For this reason, Steve Winkelman can be thought of as the true father of SB 375.

Figure 1. Atmospheric CO₂ and Mean Temperature from 800,000 Years Ago

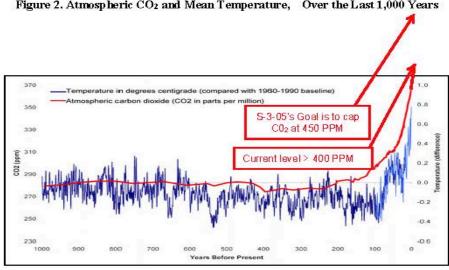
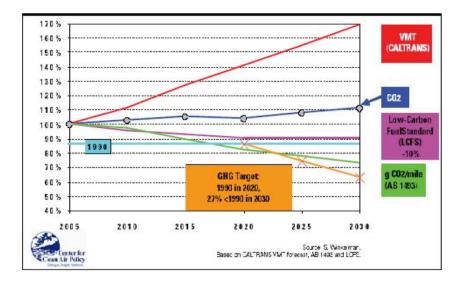


Figure 2. Atmospheric CO2 and Mean Temperature, Over the Last 1,000 Years

This table provides inspiration for a road map to climate success for LDVs. Climate stabilization targets must be identified and achieved by a set of requirements to define fleet efficiency and per-capita driving.

The S-3-05 Trajectory (the Gold Line) AND the CO2 Emitted from Personal Driving (the Blue Line), where that CO2 is a Function (the Product) of the California-Fleet-Average CO2 per Mile (the Green Line), The Predicted Driving (VMT, the Red Line), and the Low-Carbon Fuel Standard (the Purple Line)



THE DEVELOPMENT OF CALIFORNIA'S TOP-LEVEL LDV REQUIREMENTS TO SUPPORT CLIMATE STABILIZATION

It is also clear that cleaner cars will be needed and can probably be achieved. As will be seen, much cleaner cars will be needed if driving reductions are going to remain within what many people would consider achievable. Mileage and equivalent mileage will need to be specified. A significant fleet-fraction of Zero-Emission Vehicles (ZEVs, either Battery-Electric LDVs or Hydrogen Fuel Cell LDVs) will be needed. Since mileage and equivalent mileage is more heuristic than emissions per mile, they will be used instead of CO2 per mile driven.

Since the SB-375 work used 2005 as the reference year, it will remain the reference year here.

GHG Target to Support Climate Stabilization

The primary problem with S-3-05 is that California's resolve and actions have been largely ignored by other states, our federal government, and many countries. Therefore, rather than achieving 2000 levels by 2010 and being on a track to achieve 1990 levels by 2020, world emission have been increasing. Reference 7 states on Page 14 that the required rate of reduction, if commenced in 2020, would be 15%. That rate means that the factor of 0.85 must be achieved, year after year. If this were done for 10 years, the factor would be $(0.85)^{10} = 0.2$. We don't know where world emissions will be in 2020. However, it is fairly safe to assume that California will be emitting at its 1990 level in 2020, in accordance with S-3-05. This situation shows that the correct target for California is to achieve emissions that are reduced to 80% below California's 1990 value by 2030. Note that if the reductions start sooner, the rate of reduction of emissions can be less than 15% and the 2030 target could be relaxed somewhat. However, it is doubtful that the world will get the reduction rate anywhere near the needed 15% by 2020. Therefore, the target, of 80% below 1990 levels by 2030 is considered to be correct for California. Reference 7 also calls into question the advisability of aiming for a 2 degree Celsius increase, given the possibilities of positive feedbacks that would increase warming. This concern for positive feedbacks is another reason that this paper will work towards identifying LDV requirement sets that will support achieving 80% below 1990 values by 2030.

Notes on Methods

The base year is 2005. An intermediate year of 2015 is used. The car efficiency factor of 2015 with respect to 2005 is taken directly from Figure 3. The car efficiency factor of 2030 with respect to 2015 is derived herein, resulting in a set of car-efficiency requirements. It is assumed that cars last 15 years.

Primary Variable Used

Table 1 defines the primary variables that are used.

Table 1 Variable Definitions

Variable Definitions

e_k	LDV Emitted C02, in Year "k"
L_k	Low Carbon Fuel Standard (LCFS) Factor that reduces the
	Per-Gallon CO2 emissions, in Year "k"
C_k	LDV CO2 emitted per mile driven, average, in Year "k", not
	accounting for the Low Carbon Fuel Standard (LCFS) Factor
c_k	LDV CO2 emitted per mile driven, average, in Year "k", accounting
	for the Low Carbon Fuel Standard (LCFS) Factor
p_k	Population, in Year "k"
d_k	Per-capita LDV driving, in Year "k"
D_k	LDV Driving, in Year "k"
M_k	LDV Mileage, miles per gallon, in Year "k"
m_k	LDV Equivalent Mileage, miles per gallon, in Year "k" accounting for
	Low Carbon Fuel Standard (LCFS) Factor, so this is Mk/Lk
N	Number of pounds of CO2 per gallon of fuel but not accounting for
	the Low Carbon Fuel Standard (LCFS) Factor

Fundamental Equations

The emissions are equal to the CO2 per mile multiplied by the per-capita driving multiplied by the population, since per-capita driving multiplied by the population is total driving. This is true for any year.

Future Year k:
$$e_k = c_k * d_k * p_k$$
 (Eq. 1)

Base Year i:
$$e_i = c_i * d_i * p_i$$
 (Eq. 2)

Dividing both sides of Equation 1 by equal values results in an equality. The terms on the right side of the equation can be associated as shown here:

$$\frac{e_k}{e_i} = \frac{c_k}{c_i} * \frac{d_k}{d_i} * \frac{p_k}{p_i}$$
 (Eq. 3)

Since carbon dioxide emitted per gallon is just a constant (about 20 pounds per gallon), the constant cancels out of the ratio of emissions per mile, leaving the following relationship.

To work with mileage:
$$\frac{m_i}{m_k} = \frac{c_k}{c_i}$$
 (Eq. 4)

Putting Equation 4 into Equation 3 results in the following equation:

$$\frac{e_k}{e_i} = \frac{m_i}{m_k} * \frac{d_k}{d_i} * \frac{p_k}{p_i}$$
 (Eq. 5)

Showing the base year of 2005, the future year of 2030, introducing the intermediate year of 2015 and the year of 1990 (since emissions in 2030 are with respect to the 1990 value) results in Equation 6.

$$\frac{e_{2030}}{e_{1990}} * \frac{e_{1990}}{e_{2005}} = \frac{c_{2030}}{c_{2015}} * \frac{c_{2015}}{c_{2005}} * \frac{d_{2030}}{d_{2005}} * \frac{p_{2030}}{p_{2005}}$$
(Eq. 6)

The ratio on the far left is the climate-stabilizing target, which is the factor of the 2030 emission to the 1990 emission. It is shown to be 0.20 or 80% less. The next ratio is the emission of 1990 compared to 2005. It is the turquoise line of Figure 3, which is 0.87. The first ratio on the right side of the equation is the fleet emission per mile in 2030 compared to the value in 2015. This ratio will be derived in this report and it will result in a set of car efficiency requirements. Moving to the right, the next ratio is the car efficiency in 2015 compared to 2005. It can obtained by multiplying the purple line 2015 value times the green line 2015 value, which is 0.90 * 0.93. The next term is the independent variable. It is the driving reduction required, compared to the 2005 level of driving. The final term on the far right is the ratio of the population in 2030 to the population in 2005. Reference 8 shows that California's population in 2005 was 35,985,582. Reference 9 shows that California's population in 2030 is predicted to be 44,279,354. Therefore,

$$p_{2030}/p_{2005} = 44279354 \div 35985582 = 1.2305$$
 (Eq. 7)

Putting in the known values results in Equation 8:

$$0.20* 0.87 = \frac{c_{2030}}{c_{2015}} * 0.90* 0.93* \frac{d_{2030}}{d_{2005}} * 1.2305$$
 (Eq. 8)

Combining the values, solving for the independent variable (the per-capita driving ratio), and changing from emission-per-mile to equivalent-miles-per-gallon results in the following:

$$\frac{d_{2030}}{d_{2005}} = 0.1689 * \frac{m_{2030}}{m_{2015}}$$
 (Eq. 9)

With the coefficient being so small, it is doubtful that we can get the equivalent mileage in 2030 to be high enough to keep the driving ratio from falling below one. The mileage of the 2005 fleet will be based on the best data we can get and by assuming cars last 15 years. The equivalent mileage in 2030 will need to be as high as possible to keep the driving-reduction factor from going too far below 1, because it is difficult to reduce driving too much. The equivalent mileage will be dependent on the fleet-efficiency requirements in the near future and going out to 2030. Those requirements are among the primary results of this report.

Internal Combustion Engine (ICE) Mileage, from Year 2000 to Year 2030

The years from 2000 to 2011 are taken from a plot produced by the PEW Environment Group, http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Fact_Sheet/History%20of%20Fuel%20Economy%20Clean%20Energy%20Factsheet.pdf

Figure 4 Mileage Values From the PEW Environment Group 35 30 Both Average MPG Trucks 20 10 1980 1985 1990 1995 2000 2005 2010 SOURCE: EPA GOV

The plot is shown here as Figure 4. The "Both" values are used.

The values from 2012 to 2025 are taken from the US Energy Information Agency (EIA) as shown on their website, http://www.c2es.org/federal/executive/vehicle-standards#ldv-2012 to 2025. They are the LDV Corporate Average Fleet Efficiency (CAFÉ) values enacted into law in the first term of President Obama. From 2025 to 2030, it is assumed that the yearly ICE improvement in CAFÉ will be 2.5 MPG.

Mileage of California's LDV Fleet in 2015

Table 2 uses these values of the Internal Combustion Engine (ICE) LDV mileage to compute the mileage of the LDV fleet in 2015. It assumes that the fraction of ZEVs being used over these years is small enough to be ignored. The 100 miles driven, nominally, by each set of cars, is an arbitrary value and inconsequential in the final calculation, because it will divide out. It is never-the-less used, so that it is possible to compare the gallons of fuel used for the different years. The "f" factor could be used to account for a set of cars being driven less. It was decided to not use this option by setting all of the values to 1. The Low Carbon Fuel Standard (LCFS) values are taken from Figure 3. The gallons of fuel are computed as shown in Equation 10, using the definition for L_{k} that is shown in Table 1.

Table 2 Calculation of the Fleet MPG for 2015

						Gallons
				LCFS	Factor	Used Per
LDV	Years	Model	CAFE	Factor	Driven	f*100
Set	Old	Year	MPG	Lyear	f	Miles
1	14-15	2001	24.0	1.0	1.0	4.17
2	13-14	2002	24.0	1.0	1.0	4.17

3	12-13	2003	24.0	1.0	1.0	4.17
4	11-12	2004	24.0	1.0	1.0	4.17
5	10-11	2005	25.0	1.0	1.0	4.00
6	9-10	2006	25.7	.9933	1.0	3.87
7	8-9	2007	26.3	.9867	1.0	3.75
8	7-8	2008	27.0	.9800	1.0	3.63
9	6-7	2009	28.0	.9733	1.0	3.48
10	5-6	2010	28.0	.9667	1.0	3.45
11	4-5	2011	29.1	.9600	1.0	3.30
12	3-4	2012	29.8	.9533	1.0	3.20
13	2-3	2013	30.6	.9467	1.0	3.09
14	1-2	2014	31.4	.9400	1.0	2.99
15	0-1	2015	32.6	.9333	1.0	2.86
_				Sum	of Gallons:	54.29
				Miles = 100	*Sum(f's):	1500
		·	MPG = N	Iiles/(Sum o	f Gallons):	27.63

Gallons Used per
$$f * 100$$
 miles $= \frac{fx100}{(CAFEMPG)/L_k}$ (Eq. 10)

How ICE Mileage Values Will Be Used with ZEV Equivalent Mileage Values

As will be seen, after 2015, the net (computed using both ICEs and ZEVs) mileage values for each year are assumed to greatly improve by having a significant fraction of ZEVs. The ICE CAFÉ standards are used in this report as just the ICE contribution to fleet MPG. The ICE MPG values are inadequate by themselves and will therefore need to become less important because ZEVs will need to quickly take over the highways.

Federal requirements will need to change dramatically. Currently, federally-mandated corporate average fuel efficiency (CAFÉ) standards have been implemented, from 2000 to 2025. These standards require that each corporation produce and sell their fleet of cars and light-duty trucks in the needed proportions, so that the combined mileage of the cars they sell, at least meet the specified mileage.

The car companies want to maximize their profits while achieving the required CAFÉ standard. In California, the car companies will already be required to sell a specified number of electric vehicles, which have a particularly-high, equivalent-value of miles-per-gallon. If the laws are not changed, this will allow these companies to sell more low-mileage, high profit cars and light-duty trucks, and still achieve the federal CAFÉ standard.

It will be better to apply the CAFÉ standards to only the ICEs and then require that the fleet of LDVs sold achieve some mandated fraction of ZEVs. The ZEVs will get better and better equivalent

mileage, as our electrical grid is powered by more renewable sources of energy. Therefore, their equivalent mileage is not fixed, but will improve over the years. Requirements developed here are for 2030. Therefore a high percentage of all the electricity generated in the state, including both the "in front of the meter" (known as the "Renewable Portfolio Standard" or "RPS") portion and the "behind the meter" portion is assumed to come from sources that do not emit CO2. More specifically, he value of 80% is assumed. This therefore becomes a fleet-efficiency requirement.

ZEV Equivalent Mileage Values

To calculate the mileage of the 2030 fleet of LDVs, it is necessary to derive a formula to compute the equivalent mileage of ZEVs, as a function of the percent of electricity generated without emitting CO2, the equivalent ZEV mileage if the electricity is from 100% fossil fuel, and the equivalent ZEV mileage if the electricity is from 100% non-CO2 sources. The variables defined in Table 3 are used.

The derivation of the equation for equivalent ZEV mileage is based on the notion that the ZEV can be imagined to travel "r" fraction of the time on electricity generated from renewables and "(1-r)" fraction of the time on fossil fuel. If the vehicle travels "D" miles, then, using the definitions shown in Table 3, the following equation can be written.

$$G = \frac{r \times D}{m_{zr}} + \frac{(1-r) \times D}{m_{zf}}$$
 (Eq. 11)

$$m_z = D/G = D/(\frac{r \times D}{m_{zr}} + \frac{(1-r) \times D}{m_{zf}})$$
 (Eq. 12)

Dividing the numerator and the denominator by D and multiplying them both by the product of the two equivalent mileage values results in Equations 13.

$$m_z = m_{zr} \times m_{zf} / (r \times m_{zf} + (1 - r) \times m_{zr})$$
 (Eq. 13)

Again, using the definitions in Table 3 results in the following.

$$m_z = Num/(Den)$$
 (Eq. 14)

Table 3 Variables Used in the Calculation of ZEV Equivalent Mileage

Variable	Definition
m_z	ZEV Equivalent mileage
m_{zr}	ZEV Equivalent mileage if the electricity is from renewables
m_{zf}	ZEV Equivalent mileage if the electricity is from fossil fuels
r	fraction of electricity generated from sources not emitting CO2
\boldsymbol{G}	Gallons of equivalent fuel used
D	Arbitrary distance travelled
Num	$m_{zr}{ imes}m_{zf}$
Den	$r \times m_{zf} + (1-r) \times m_{zr}$

Table 4 shows an assignment of assumed values and the result of a calculation, using Equations 13, 14, and the definitions in Table 3, to produce a ZEV equivalent mileage.

Table 4 Variable Assignment and the Resulting ZEV Mileage

m_{zr}	m_{zf}	r	1-r	Num	Den	m_z
5000	70	0.8	0.2	350000.00	1056.00	331.44

Computing an LDV Fleet Mileage Assuming Heroic Measures (HM)

Table 5 shows the additional definitions that will be used in this calculation. Table 6 computes the 2030 LDV mileage, assuming "Heroic Measures" to reduce the miles driven in poor-mileage ICE's, in building and selling a significant fraction of ZEVs, and in getting the Low Carbon Fuel Standards to continue to improve beyond the Figure 3 minimum of 0.90.

Table 5 Additional Variables Used in the Calculation of 2030 LDV Mileage

Variable	Definition
D_i	Distance travelled by ICE vehicles
D_z	Distance travelled by ZEVs
G_i	Gallons of Equivalent fuel used by ICE vehicles
G_z	Gallons of Equivalent fuel used by ZEVs

As shown by the values for "f", government policies must be adopted, in 2030, to reduce the miles driven by the ICE's, from model years 2016 to 2023. The 2016 model ICE's are driven only 30% as much as the nominal amount. The 2017 year ICE's can be driving 10% more. This rate of change continues up to 2023, when the ICE's are doing less damage, due to the large fraction of ZEVs on the road.

Table 6 Calculation of 2030 LDV Mileage Assuming Heroic Measures

	ICE	Parame	ters an	d Cal	7	ZEV	s	<u>Ye</u>	arly To	tals_		
Year	CAFÉ MPG	LCFS	Eq. MPG	f	D_i	G_i	z	D _z	G_z	Total Miles	Total Gallon s	2030 MPG
2016	34.3	.9267	37.01	.3	30.0	.8105	.04	4	.012	32.8	.7901	41.51
2017	35.1	.9200	38.15	.4	40.0	1.0484	.07	7	.021	44.2	.9962	44.37
2018	36.1	.9133	39.53	.5	47.5	1.2018	.12	12	.036	56.0	1.1494	48.72
2019	37.1	.9000	40.92	.6	54.0	1.3197	.18	18	.054	67.2	1.2567	53.47
2020	38.3	.8500	42.56	.7	52.5	1.2337	.24	24	.072	77.2	1.3225	58.37
2021	40.3	.8000	47.41	.8	48.0	1.0124	.34	34	.103	86.8	1.2162	71.37
2022	42.3	.8000	52.88	.9	40.5	.7660	.48	48	.145	94.8	1.0299	92.05

2023	44.3	.8000	55.38	1.0	30.0	.5418	.62	62	.187	100.0	.8733	114.51
2024	46.5	.8000	58.13	1.0	15.0	.2581	.76	76	.229	100.0	.6422	155.71
2025	48.7	.8000	60.88	1.0	5.0	.0821	.90	90	.272	100.0	.4358	229.46
2026	51.2	.8000	64.00	1.0	5.0	.0781	.95	95	.287	100.0	.3648	274.16
2027	53.7	.8000	67.13	1.0	5.0	.0745	.98	98	.296	100.0	.3255	307.24
2028	56.2	.8000	70.25	1.0	5.0	.0712	.99	99	.299	100.0	.3129	319.56
2029	58.7	.8000	73.38	1.0	5.0	.0681	.99	99	.299	100.0	.3123	320.18
2030	61.2	.8000	76.50	1.0	5.0	.0654	.99	99	.299	100.0	.3118	320.75
	Sum of Miles and then Gallons of Equivalent Fuel: 1259.00 11.34											
	Equivalent MPG of LDV Fleet in 2030: 111.03											
Sum	Sum of ZEV Miles = 865. Fraction of Miles Driven by ZEVs = 68.7%											

As shown, the ZEV fraction of the fleet assumes the value of 12%, just 2 years from now (shown in the green field.) It then proceeds upward, to 18% in 2019; 24% in 2020; 34% in 2021; and so on, until it reaches 99% by 2028.

Achieving these fractions of ZEVs might be compared to what was done during World War II, when automobile productions lines were rapidly converted to produce tanks. This reduced the new cars that could be purchased. Besides this, rationing gasoline made it difficult to drive at times and, due to shortages of leather, which was being used to produce boots for soldiers, some citizens found it hard to even buy shoes. These rapid and inconvenient changes were tolerated, because most people agreed that the war needed to be won. The heroic measures assumed here may not be possible unless citizens and the political leaders they elect understand the dire consequences of climate destabilization and therefore accept, and even demand, the measures that are needed to support climate stabilization.

The equivalent miles per gallon of the LDV fleet in 2030, specifically 111.03 miles per gallon, will be considered as a potential 2030 LDV requirement.

Computing the Heroic-Measures (HM) Case Per-Capita and Net Driving Factor Requirements, Based on the Result Shown in Table 6

Plugging the

- equivalent MPG of the LDV fleet in Year 2030, taken from the bottom of Table 6, which is 111.03 MPG (m₂₀₃₀), and
- the MPG of the LDV fleet in Year 2015, taken from the bottom of Table 2, which is 27.63 MPG (m₂₀₁₅),

into Equation 9, gives the following result:

$$\frac{d_{2030}}{d_{2005}} = 0.1687 * \frac{m_{2030}}{m_{2015}} = 0.1687 * \frac{111.03}{27.63} = 0.68$$
 (Eq. 14)

This means that the per-capita driving in 2030 will need to be about 32% less than in year 2005. The net driving can be computed by multiplying the per-capita driving, 0.68, by the population factor of 1.2305, computed in Equation 7, resulting in 0.84 (since 0.68 x 1.2305 = 0.84.) This means that, even with the 23% increase in California's population, the net driving will have to drop by 16%. If this LDV requirement set is selected, all of California's transportation money can be used to improve transit, improve active transportation (mainly walking and biking), and maintain, but not expand, roads. The good news is that there can be little or no congestion because highway capacity now is larger than it was in 2005. Policies will be needed to achieve the required reduction in driving.

Case 2: Computing LDV Requirements that Support Climate Stabilization but Still Allow 2005 Per-Capita Driving

The first step is to use Equation 9 and the value of the mileage in 2015 to compute the needed LDV equivalent fleet mileage for 2030 if the left side of the equation is equal to 1.0.

$$m_{2030} = 1.0 \text{ x } m_{2015} / 0.1689 = 27.63 / 0.1689 = 163.59 \text{ MPG}$$
 Eq. 15)

Table 7 is constructed, with the fraction of ZEVs selected to achieve the needed equivalent fleet mileage of about 163.59 MPG. Since its ZEV fractions are larger and sooner than in the "Heroic Measures" table, Table 7 is showing what has been called the "Extra-Heroic Measures" (EHM) case. The ICE "f' values are unchanged; as are the LCFS values. The EHM ZEV differences from the HM case are the highlighted "z" values.

This means that with the 23% increase in California's population, computed in Equation 7, the net driving would also increase by 23%. If this LDV requirement set were to be implemented, a lot of California's transportation money would be needed to expand the highway system, leaving less to improve transit, improve active transportation (mainly walking and biking), and maintain roads.

Table 7 Calculation of 2030 LDV Mileage Assuming Extra-Heroic Measures

	ICE	Parame	eters an	d Cal	ZEVs			Yearly Totals				
Year	CAFÉ MPG	LCFS	Eq. MPG	f	D_i	G_i	z	D _z	G_z	Total Miles	Total Gallon s	2030 MPG
2016	34.3	.9267	37.01	.3	30.0	.8105	.04	0	.012	32.8	.7901	41.51
2017	35.1	.9200	38.15	.4	36.0	.9436	.10	10	.030	46.0	.9738	47.24
2018	36.1	.9133	39.53	.5	35.0	.8855	.25	25	.075	62.5	1.024	61.02
2019	37.1	.9000	40.92	.6	30.0	.7332	.40	40	.121	76.0	1.000	75.96
2020	38.3	.8500	42.56	.7	21.0	.4935	.65	65	.196	89.5	.7718	115.96
2021	40.3	.8000	47.41	.8	8.0	.1687	.90	90	.272	98.0	.4403	222.59

2022	42.3	.8000	52.88	.9	4.5	.0851	.95	95	.287	99.5	.3717	267.66
2023	44.3	.8000	55.38	1.0	5.0	.0903	.95	95	.287	100.0	.3769	265.31
2024	46.5	.8000	58.13	1.0	5.0	.0860	.98	98	.296	100.0	.3301	302.95
2025	48.7	.8000	60.88	1.0	5.0	.0821	.98	98	.296	100.0	.3285	304.38
2026	51.2	.8000	64.00	1.0	5.0	.0781	.999	99	.299	100.0	.3143	318.14
2027	53.7	.8000	67.13	1.0	5.0	.0745	.99	99	.299	100.0	.3136	318.88
2028	56.2	.8000	70.25	1.0	5.0	.0712	.99	99	.299	100.0	.3129	319.56
2029	58.7	.8000	73.38	1.0	5.0	.0681	.99	99	.299	100.0	.3123	320.18
2030	61.2	.8000	76.50	1.0	5.0	.0654	.99	99	.299	100.0	.3118	320.75
	Sum of Miles and then Gallons of Equivalent Fuel: 1304.30 7.97											
	Equivalent MPG of LDV Fleet in 2030: 163.59											

Comparing the ZEV Fraction Values of the "Heroic-Measures" (HM) Case to the "Extra-Heroic Measures" (EHM) Case

Table 8 shows the direct comparison of the ZEV fractions that are ZEV requirements for the HM Case and the EHM Case. The largest differences are highlighted. The EHM case does not appear to be achievable.

Table 8 HM Case and the EHM Case Which Supports 2005 Per-Capita Driving

Cases	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	20292	2030
НМ	.04	.07	.12	.18	.24	.34	.48	.62	.76	.90	.95	.98	.99	.99	.99
ЕНМ	.04	.10	.25	.40	.65	.90	.95	.95	.98	.98	.99	.99	.99	.99	.99

ACHIEVING THE REQUIRED DRIVING REDUCTION OF THE HEROIC-MEASURES (HM) CASE

As shown in Equation 14, in 2030, the per-capita driving will need to at least 32% below the 2005 value. As shown in this link, http://en.wikipedia.org/wiki/SB-375, California's Metropolitan Planning Organizations (MPOs) are adopting Region Transportation Plans (RTPs) that will achieve reductions in year 2020 and 2035. As also shown there, the targets, for year 2035, range from 0% for Shasta to 16% for Sacramento Area Council of Governments. Since this is for 2030 instead of 2035, and to be reasonably conservative, it is assumed here that the state will achieve a 10% reduction in per-capita driving, in 2030, compared to 2005. This leaves 22% to be achieved by new programs.

The title of each of the following subsections contains the estimated per-capita driving reduction each strategy will achieve, by 2030.

Reallocate Funds Earmarked for Highway Expansion to Transit and Consider Transit-Design Upgrades (3%)

San Diego County has a sales tax measure called "TransNet", which allocates one-third for highway expansion, one-third for transit, and one-third for road maintenance. It has a provision that allows for a reallocation of funds, if supported by at least two-thirds of SANDAG Board members, including a so-called weighted vote, where governments are given a portion of 100 votes, proportional to their population. It is hereby proposed to reallocate the TransNet amount, earmarked for highway expansion, to transit and to do similar reallocations throughout California.

This money could be used to fund additional transit systems; improve transit operations; and/or the redesign and implementation of the redesign of existing transit systems. The redesign could include electrification and automation or even upgrading to a different technology.

A Comprehensive Road-Use Fee Pricing and Payout System to Unbundle the Cost of Operating Roads (7.5%)

Comprehensive means that pricing would be set to cover all costs (including road maintenance and externalities such as harm to the environment and health); that privacy and the interests of low-income drivers doing necessary driving would be protected; that the incentive to drive fuel-efficient cars would be at least as large as it is under the current fuels excise tax; and, as good technology becomes available, that congestion pricing is used to protect critical driving from congestion.

The words *payout* and *unbundle* mean that some of the money collected would go to people that are losing money under the current system.

User fees (gas taxes and tolls) are not enough to cover road costs ¹⁰ and California is not properly maintaining its roads. Reference 10 shows that in California user fees amount to only 24.1% of what is spent on roads. Besides this, the improved mileage of the ICEs and the large number of ZEVs needed mean that gas tax revenues will drop precipitously.

This system could be used to help reduce the ICE LDV miles driven in 2016 to 2022, as shown in the "f' column of Tables 6 and 7. This system could probably be implemented in less than 5 years.

Unbundling the Cost of Car Parking (7.5%)

Unbundling the cost of car parking ¹¹ throughout California is conservatively estimated to decrease driving by 7.5%, based on Table 1 of Reference 11. That table shows driving reductions resulting from introducing a price for parking, for 10 cases. Its average reduction in driving is 25% and its smallest reduction is 15%.

Good Bicycle Projects and Bicycle Traffic Skills Education (3%)

The best criterion for spending money for bicycle transportation is the estimated reduction in driving per the amount spent. The following strategies may come close to maximizing this parameter.

Projects to Improve Bicycle Access

All of the smart-growth neighborhoods, central business districts, and other high trip destinations or origins, both existing and planned, should be checked to see if bicycle access could be substantially improved with either a traffic calming project, a "complete streets" project, more shoulder width, or a project to overcome some natural or made-made obstacle.

League of American Bicyclist Certified Instruction of "Traffic Skills 101"

Most serious injuries to bike riders occur in accidents that do not involve a motor vehicle ¹². Most carbike accidents are caused by wrong-way riding and errors in intersections; the clear-cut-hit-from-behind accident is rare ¹².

After attending Traffic Skills 101, students that pass a rigorous written test and demonstrate proficiency in riding in traffic and other challenging conditions could be paid for their time and effort.

As an example of what could be done in San Diego County, if the average class size was 3 riders per instructor and each rider passes both tests and earns \$100 and if the instructor, with overhead, costs \$500 dollars, for a total of \$800 for each 3 students, that would mean that \$160M could teach \$160M/\$800 = 200,000 classes of 3 students, for a total of 600,000 students. The population of San Diego County is around 3 million.

Eliminate or Greatly Increase the Maximum Height and Density Limits Close to Transit Stops that Meet Appropriate Service Standards (2%)

As sprawl is reduced, more compact, transit-oriented development (TOD) will need to be built. This strategy will incentivize a consideration of what level of transit service will be needed, how it can be achieved, and what levels of maximum height and density are appropriate. Having no limits at all is reasonable if models show that the development can function without harming the existing adjacent neighborhoods, given the level of transit service and other supporting transportation policies (such as car parking that unbundles the cost and supports the full sharing of parking ¹¹) that can be assumed.

Net Driving Reduction from All Identified Strategies

By 2030, the sum of these strategies should be realized. They total 23%, resulting in a 1% margin over the needed 22% (which is added to the existing 10% to get the needed 32%.)

ADDITIONAL ELECTRICITY REQUIRED

The URL http://www.energy.ca.gov/2013 energypolicy/documents/2013-06-26 workshop/presentations/09 VMT-Bob RAS 21Jun2013.pdf shows that Californians drove about 325 Billion miles per year, from 2002 to 2011. This value can be multiplied by the 0.84 factor reduction of driving, computed right after the calculation shown in Equation 14, and the fraction of miles driven by ZEVs, shown at the bottom of Table 6, of 0.687 (from 68.7%), to give the 2030 miles driven by ZEVs = 325 Billion x 0.84 x 0.687 = 188 Billion miles per year.

Using the Tesla information here http://en.wikipedia.org/wiki/Tesla Roadster, it is assumed that 21.7 kW-h is used per 100 miles, or 0.217 kW-h per mile. The total energy used per year is therefore 188 Billion miles x 0.217 kW-h = 40,699 GW-h.

http://www.cpuc.ca.gov/cfaqs/howhighiscaliforniaselectricitydemandandwheredoesthepowe rcomefrom.htm, shows that California is using about 265,000 GW-h per year. Therefore the electricity needed to power California's HM ZEV LDF fleet in 2030 is 100% x 40,648/265,000 = 15.34% of the amount of electricity California is currently using. Table 4 shows that 80% (r = 0.80, with "r" defined in Table 3) of electricity must generated without producing CO2. This estimated 15.34% increase in demand should help the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) with their planning.

COMPARISON WITH CALIFORNIA AIR RESOURCES BOARD (CARB) PLANNING

The following quote¹³ allows us to compare the CARB plan for LDVs with what would be required to stabilize the climate at a livable level, in the form of the Heroic Measures case:

Regulations on the books in California, set in 2012, require that 2.7 percent of new cars sold in the state this year be, in the regulatory jargon, ZEVs. These are defined as battery-only or fuel-cell cars, and plug-in hybrids. The quota rises every year starting in 2018 and reaches 22 percent in 2025. Nichols wants 100 percent of the new vehicles sold to be zero- or almost-zero-emissions by 2030

Table 9 shows the values implied by this statement and compares them to the HM values. Table 10, which is similar to Tables 6 and 7, computes the overall mileage of the 2030 fleet, using the CARB values.

Computing the Heroic-Measures (HM) Case Per-Capita and Net Driving Factor Requirements, Based on the Result Shown in Table 10

Plugging the

- equivalent MPG of the LDV fleet in Year 2030, taken from the bottom of Table 10, which is 74.25 MPG, and
- the MPG of the LDV fleet in Year 2015, taken from the bottom of Table 2, which is 27.63 MPG.

into Equation 8, gives the following result:

$$\frac{d_{2030}}{d_{2005}} = 0.1687 * \frac{m_{2030}}{m_{2015}} = 0.1687 * \frac{74.25}{27.63} = 0.45$$
 (Eq. 16)

Table 9 Zero Emission Vehicle (ZEV) % of Fleet, for Two Cases

		Heroic			Heroic
Year	CARB	Measures	Year	CARB	Measures

2016	2.7%	4.0%	2024	19.6%	76.0%
2017	2.7%	7.0%	2025	22.0%	90.0%
2018	5.1%	12.0%	2026	37.6%	95.0%
2019	7.5%	18.0%	2027	53.2%	98.0%
2020	9.9%	24.0%	2028	68.8%	99.0%
2021	12.4%	34.0%	2029	84.4%	99.0%
2022	14.8%	48.0%	2030	100.0%	99.0%
2023	17.2%	62.0%			

This means that the per-capita driving will need to be about 55% less in 2030 than in year 2005. The net driving can be computed by multiplying the per-capita driving, 0.45, by the population factor of 1.2305, computed in Equation 7, resulting in 0.55. This means that, even with the 23% increase in California's population, the net driving will have to drop by 45%. If CARB wants the LDV sector to achieve a reasonable climate-stabilizing target, it will need to require ZEV adoption profile closer to the Heroic Measures Case. The adoption profile they have now will required a reduction in driving that will probably be very difficult to achieve.

CONCLUSION

A requirement set named "Heroic Measures" (HM) is quantified. Table 8 shows that the HM LDV efficiency requirements are much easier to achieve than those needed to allow per-capita driving to remain close to its 2005 level, which has been quantified as the "Extra Heroic Measures Case". Strategies to achieve the required HM driving reductions are also allocated and described. They are perhaps about as difficult as achieving the HM LDV fleet efficiency. It is computed that the 2030 fleet of LDV HM ZEVs would require an amount of electricity which is equal to about 15% of what California is using today. The current CARB plan for ZEV adoption is shown to require a very large reduction in driving if LDVs are to achieve a climate-stabilizing target.

123-1

Table 10 Calculation of 2030 LDV Mileage Assuming the CARB Values

ICE Parameters and Calculations	ZEVs	Yearly Totals
---------------------------------	------	---------------

Year	CAFÉ MPG	LCFS	Eq. MPG	f	D_i	G_i	z	D _z	G_z	Total Miles	Total Gallon s	2030 MPG
2016	34.3	.9267	37.01	.3	30.0	.8105	.03	3	.008	31.9	.79681	40.02
2017	35.1	.9200	38.15	.4	40.0	1.0484	.03	3	.008	41.6	1.0283	40.48
2018	36.1	.9133	39.53	.5	47.5	1.2018	.05	5	.015	52.6	1.2158	43.23
2019	37.1	.9000	40.92	.6	54.0	1.3197	.08	8	.023	63.0	1.3787	45.70
2020	38.3	.8500	42.56	.7	52.5	1.2337	.10	10	.030	73.0	1.5114	48.29
2021	40.3	.8000	47.41	.8	48.0	1.0124	.12	12	.037	82.5	1.5162	54.39
2022	42.3	.8000	52.88	.9	40.5	.7660	.15	15	.045	91.5	1.4954	61.17
2023	44.3	.8000	55.38	1.0	30.0	.5418	.17	17	.052	100.0	1.5475	64.62
2024	46.5	.8000	58.13	1.0	15.0	.2581	.20	20	.059	100.0	1.4425	69.32
2025	48.7	.8000	60.88	1.0	5.0	.0821	.22	22	.066	100.0	1.3477	74.20
2026	51.2	.8000	64.00	1.0	5.0	.0781	.38	38	.113	100.0	1.0884	91.87
2027	53.7	.8000	67.13	1.0	5.0	.0745	.53	53	.161	100.0	.8577	116.59
2028	56.2	.8000	70.25	1.0	5.0	.0712	.69	69	.208	100.0	.6517	153.44
2029	58.7	.8000	73.38	1.0	5.0	.0681	.84	84	.255	100.0	.4673	214.02
2030	61.2	.8000	76.50	1.0	5.0	.0654	1.0	100	.302	100.0	.3017	331.44
	Sum of Miles and then Gallons of Equivalent Fuel: 1236.00 16.65											
Equivalent MPG of LDV Fleet in 2030: 74.25												

ABREVIATIONS AND ACRONYMS

AB 1493 California's Assembly Bill 1493

HM

"Heroic Measures" LDV Case

AB 32	California's Assembly Bill 32	ICE	Internal Combustion Engine LDV
APS	Alternative Planning Strategy	kW-h	Kilo Watt-hour
CAFE	Corporate Average Fuel Efficiency	LCFS	Low Carbon Fuel Standard
CARB	California Air Resources Board	LDV	Light-Duty Vehicle
CBD	Center for Biological Diversity	MPO	Metropolitan Planning Organization
CEC	California Energy Commission	Pavley	Senator Pavley's AB 1493
CEQA	California Environmental Quality Act	PPM	Parts per Million
CPUC	California Public Utilities Commission	RPS	Renewable Portfolio Standard
CCAP	Center for Clean Air Policy	RTP	Regional Transportation Plan
CNFF	Cleveland National Forest Foundation	S-3-05	Governor's Executive Order S-3-05
SB 375	California's Senate Bill 375	SANDAG	San Diego Association of
CO_2	Carbon Dioxide		Governments
CO ₂ _e	Carbon Dioxide Equivalent GHG	SCS	Sustainable Community Strategy
EHM	"Extra Heroic Measures" LDV Case	TransNet	San Diego County sales tax
GEO	Governor's Executive Order	URL	Universal Resource Locator
GHG	Greenhouse gas	VMT	Vehicle Miles Travelled
GW-h	Giga Watt-Hours	ZEV	Zero Emission Vehicle LDV

ACKNOWLEGEMENTS

Darrell Clarke, Lead Volunteer for the Sierra Club's "Beyond Oil Campaign"; Dr. Dennis Martinek, Oceanside Planning Commissioner; Sandra Goldberg, formerly California Deputy Attorney General; Dr. Nilmini Silva-Send, Senior Policy Analyst of the Energy Policy Initiative Center; Diane Nygaard, Director of Preserve Calavera and founder of Nelson Nygaard Consulting Associates; Jack Shu, CNFF President; Joan Bullock; San Diego Sierra Club Executive Committee Chairs: Caroline Chase, John Stump, and (former Assembly Member) Lori Saldaña; Malinda Dickenson, Law Offices of Malinda R. Dickenson; Conservation Committee Chair Mollie Biggers; Ed Mainland and Jim Stewart, Co-Chairs, Energy-Climate Committee, Sierra Club California; Bern Grush, Chief Scientist, Skymeter Corporation; and SANDAG Staff: Susan Baldwin, Senior Regional Planner; Charles Stoll, Director of Land Use and Transportation Planning; and Stephan Vance, Senior Regional Planner.

REFERENCES

- Anders, S. J.; De Haan, D. O.; Silva-Send, N.; Tanaka, S.T.; Tyner, L.; San Diego County Greenhouse Gas Inventory, September 2008, http://www.sandiego.edu/epic/ghginventory/
- 2 Tarbuck, E.; Lutgens, F.; Earth Science; Tenth Edition, published by Prentice Hall, 2003, page 539
- Vespa, M.; Comments on Survey of CEQA Documents on Greenhouse Gas Emissions Draft Work Plan and Development of GHG Threshold of Significance for Residential and Commercial Projects, Letter from Center for Biological Diversity to Elaine Chang, Deputy Executive Officer of Planning, Rule Development, and Area Sources of the South Coast Air Quality Management District; dated April 15, 2009. http://www.aqmd.gov/ceqa/handbook/GHG/2009/april22mtg/CBDcomments.pdf
- 4 Hertsgaard, M; Latino Climate Solution, the Nation, Dec. 24/31, 2012.
- 5 Whitney E.; How to Meet the Climate Crisis, UU World, Volume XXVI No. 4, Winter 2012.

- 6 Adams, T.; Eaken, A.; Notthoff, A.; Communities Tackle Global Warming, A Guide to California's SB 375, June 2009, NRDC; http://www.nrdc.org/globalWarming/sb375/files/sb375.pdf
- 7 Hansen, James, Brief of Amicus Curiae, Exhibit A, Case3:11-cv-o22o3-EMC Document108 Filed 11/14/11. from http://ourchildrenstrust.org/sites/default/files/Hansen%20Amicus%20.pdf
- State of California, Department of Finance, California County Population Estimates and Components of Change by Year, July 1, 2000-2010. Sacramento, California, December 2011, from http://www.dof.ca.gov/research/demographic/reports/estimates/e-2/2000-10/, the "E-2. California County Population Estimates and Components of Change by Year July 1, 2000-2010"
- 9 Schwarm, Walter, Demographic Research Unit, California Department of Finance, Total Population Projections for California and Counties: July 1, 2015 to 2060 in 5-year Increments, from http://www.dof.ca.gov/research/demographic/reports/projections/P-1/, then "Report P-1 (County): State and County Total Population Projections, 2010-2060 (5-year increments) link, to open or download the EXCEL spreadsheet file.
- Henchman, Joseph; Gasoline Taxes and Tolls Pay for Only a Third of State & Local Road Spending; January 17, 2013; http://taxfoundation.org/article/gasoline-taxes-and-tolls-pay-only-third-state-local-road-spending
- Bullock, M.; Stewart, J.; A Plan to Efficiently and Conveniently Unbundle Car Parking Costs; Paper 2010-A-554-AWMA, from the Air and Waste Management Association's 103rd Annual Conference and Exhibition; Calgary, Canada, June 21-24, 2010. http://sierraclub.typepad.com/files/mike-bullock-parking-paper.pdf
- 12 Forester, J. Effective Cycling, MIT Press, 6th Edition, 1993.
- Lippert, John; Bloomberg News August 2, 2015; California Has a Plan to End the Auto Industry as We Know It; http://www.bloomberg.com/news/articles/2015-08-03/californiaregulator-mary-nichols-may-transform-the-auto-industry

KEYWORDS

Driving, climate, mandates, S-3-05, SB 375, RTP, CEQA, Unbundled, GHG, CAFÉ, ZEVs

Letter 139

























April 10, 2017

California Air Resources Board 1001 "I" Street Sacramento, CA 95814

Submitted electronically at www.arb.ca.gov/cc/scopingplan/scopingplan.htm

Re: Comments on the 2017 Climate Change Scoping Plan Update

To the California Air Resources Board:

The Sierra Club, Natural Resources Defense Council, Solar Energy Industries
Association, Sacramento Municipal Utilities District, Marin Clean Energy, Build It Green, Local
Government Sustainable Energy Coalition, Association of Bay Area Governments, Bay Area
Regional Energy Network, Carbon Free Palo Alto, Redwood Energy, and Design AVEnues
submit the following comments on the January 20, 2017 Proposed Climate Change Scoping Plan
Update ("Proposed Scoping Plan"). We appreciate the efforts of the Air Resources Board
("ARB") in preparing the Proposed Scoping Plan and accompanying materials.

In order to "spur the transformation of the California economy and fix its course securely on achieving an 80 percent reduction in greenhouse gas emissions by 2050," it is critical the

1

¹ Proposed Scoping Plan Update, ES3.

Proposed Scoping Plan set the appropriate expectations to scale up deployment of clean energy and build the momentum needed to reach long-term climate goals. In excluding specific expectations for building decarbonization from the default scenario, we are concerned that the Proposed Scoping Plan does not adequately address greenhouse gas ("GHG") emissions from fossil fuel use in residential and commercial buildings, which is a major source of GHG emissions and an important sector to decarbonize. Building decarbonization is widely recognized as a critical strategy to achieve long-term climate goals that will take time to fully implement. While renewable gas, i.e. biomethane and power-to-gas, could be part of the solution to minimize emissions in the existing building stock and in end uses that will be hard or will take a long time to electrify, the ability to scale these fuel sources as the main pathway to achieve California's climate goals in an affordable and sustainable manner for buildings has not been demonstrated. In addition, the issue of fugitive emissions across the entire gas supply chain remains unsolved. Lastly, biomethane generates hazardous criteria pollution that can impair the state's ability to meet air quality goals. It is therefore critical for ARB to ensure that building electrification is developed as a viable, scalable and affordable pathway to achieve 2050 climate goals.

ARB should amend the Proposed Scoping Plan to:

- (1) Establish specific targets in the Proposed Scenario, as previously included in the Alternative 1 scenario, ³ for electrifying space and water heating in residential and commercial buildings in 2020-2030;
- (2) Conduct analysis on the timeline, pathway, and barriers to achievement of building decarbonization targets; and,
- (3) Identify activities that are needed by key state agencies to both address policy and market barriers for building electrification and to spur market transformation and

139-1

² In a detailed analysis performed for the California Energy Commission, researchers at Lawrence Berkeley National Lab found that it was necessary to achieve full electrification of all space and water heating, in residential and commercial buildings, to meet the 2050 carbon goals. M. Wei et al., Scenarios For Meeting California's 2050 Climate Goals. Lawrence Berkeley National Lab (Sept. 2013), p. 80. https://eetd.lbl.gov/sites/all/files/ca-2050-climate-goals.pdf. Similarly, a report by the Deep Decarbonization Pathways Project corroborated this conclusion and found that electrifying natural gas end uses in buildings was essential in order to reduce greenhouse gas emissions to levels consistent with international climate goals. Williams, J.H., et al. (2014). Pathways to deep decarbonization in the United States. The U.S. report of the Deep Decarbonization Pathways Project of the Sustainable Development Solutions Network and the Institute for Sustainable Development and International Relations. Revision with technical supplement, Nov 16, 2015

³ Proposed Scoping Plan Update, <u>Appendix D</u>, p.10

deployment in order to achieve above targets.

The Proposed Scenario Should Be Revised to Include Building Electrification and Decarbonization Targets for the 2020 through 2030 Timeframe.

In order to lay the groundwork to achieve long-term climate goals, the Proposed Scoping Plan needs to establish targets for building decarbonization and provide further direction for how to dramatically reduce GHG emissions in buildings in line with California's climate goals. Water and space heating in residential and commercial buildings is a major source of GHG emissions, on par with the emissions from all in-state power plants. ⁴ As California decarbonizes electricity generation, the buildings sector's share of California's emissions will only grow.

Decarbonizing buildings is not a "turn-key" strategy, but rather requires significant planning, policy reform, and market transformation. State agencies and other key actors need to begin to plan now to ensure market and policy barriers can be overcome in a timely and cost-effective manner. Absent action today to support and signal building electrification, California can expect the continuation of current construction trends, further entrenching an almost exclusive dependency on natural gas. The building infrastructure and gas distribution pipelines that California invests in over the next 13 years will be major sources of GHG emissions well beyond 2030. Instead of investing in infrastructure that may be inviable with long-term climate goals, the Proposed Scoping Plan should prompt clean energy infrastructure planning for the long-term. ARB can trigger this longer term planning by including building electrification targets in the Proposed Scenario.

Despite the importance of achieving progress in building electrification within the 2020 to 2030 timeframe in order to meet long-term 2050 emission reduction targets, the Proposed Scoping Plan includes no expectations for building electrification. Instead, electrification targets, which include increases in the proportion of residential and commercial water heater sales that are electric heat pumps, are only included in Alternative 1.5 We ask that ARB include these same electrification expectations in the Proposed Scoping Plan Scenario.

⁴ California Air Resources Board (CARB) GHG Inventory data shows that over the last five reported years (2010-2014) emissions from the residential and commercial sectors averaged 51 MMT CO2e annually, compared to 48 MMT CO2e for in-state power plants. In the residential sector 90 percent of these emissions were from fuels burned on-site, versus 63 percent for the commercial sector.

Proposed Scoping Plan, Appendix D, pp 6, 10.

2) The Proposed Scenario's Exclusion of Targets for Building Electrification is Counter to AB 197.

Under AB 197, ARB is required to "prioritize . . . rules and regulations that result in direct emission reductions." Because electrifying heating and household appliances eliminates emissions from smaller point sources, this sector should be prioritized. Yet even though ARB's own AB 197 analysis indicates that building electrification is relatively cost-effective when compared with the other measures in the Proposed Scenario, specific expectations for building electrification are only included in the Alternative Scenario. To comply with AB 197, the building electrification measure should also be included in the Proposed Scenario.

The following Table compares the cost of building electrification to other measures in the Proposed Scenario.

Measure	Cost/metric ton in 2030
50% RPS	\$100 to \$300
Mobile Sources CFT and Freight	<\$50
Liquid Biofuels (18% Crabon Reduction Target - LCFS)	\$250
20% Refinery Measure	\$70 to \$200
Short-Lived Climate Pollutant Strategy	TBD
10% of residential and commercial electric space heating, water heating, A/C and refrigeration are assumed to be flexible by 2018	-\$500 to -\$300
2x additional achievable EE in the 2015 IEPR	-\$550 to -\$300
Building electrification: 2.5x additional achievable EE in the 2015 IEPR, electrification of buildings (heat pumps & res. electric stoves) and early retirement of HVAC	\$100 to \$200

Table 1: Estimated 2030 Cost Per Metric Ton by Measure

⁶ Cal. Health & Safety Code § 38562.5.

⁷ Proposed Updated Scoping Plan, Table III-3. Estimated 2030 Cost Per Metric Ton by Measure

Moreover, from a social cost of carbon perspective, ARB's analysis projects that the building electrification measure could yield large climate benefits ranging from \$115-\$800/metric ton.8

In addition, building electrification also comports with ARB's narrative criteria used to assess the Proposed Scenario and alternate scenarios. 9 Below we evaluate building electrification using ARB's metrics to demonstrate that it is a promising addition to the larger state climate strategy.

Criteria	Details for Increased Electrification of Residential and Commercial Buildings	
Ability to Reduce GHGs to Meet the 2030 Target	Incorporates new commitments to reduce emissions from fossil fuel use in buildings, which is a relatively untapped but significant opportunity. As new and existing generation resources that will serve the new load from building electrification become increasingly renewable, the GHG savings of electrification will increase. This is also a critical component of reducing GHGs beyond the 2030 timeline.	
Air Quality Co-Benefits	Lower fossil fuel use and increased electrification will reduce criteria pollutants and toxic air contaminants.	
Prioritize Rules and Regulations for Direct Emission Reductions	 Direct use of fossil fuels in buildings is a major source of GHGs and other pollutants, on par with all in-state power plants. Electrification is a primary strategy to achieve direct emission reductions from the buildings sector. 	
Potential to Protect Against Emissions Leakage	Electrification of buildings will reduce the need to develop new natural gas infrastructure, thereby reducing fugitive methane emissions across the entire gas supply chain. Replacing fossil gas use in buildings with renewable natural gas, however, does not.	
Support the development of integrated and cost-effective regional, national, and international GHG reduction programs	Provides leadership on how to reduce fossil fuel use in buildings using high efficiency electric technologies. Spurs market transformation and innovation in California. Could provide a policy model for other states to adopt similar measures. Investment in high efficiency electric infrastructure in California will increase the	

⁸ Proposed Updated Scoping Plan, Table III-2. Estimated Climate Benefits (Avoided Economic Damages) by Policy or Measure in 2030
⁹ Proposed Updated Scoping Plan, p.57

	availability of cost effective high efficiency electric equipment across the country as well.
Funding	N/A
Public Health Benefit	 Reduces GHGs, NOx, VOCs, particulate matter, and other hazardous pollutants. Improves safety by decreasing or eliminating combustion of fossil fuels inside homes and buildings.
Compliance Flexibility and Cost-Effective	 Several cost-effective building electrification practices exist today for residential and commercial buildings. The number of cost-effective applications will increase with policy reform and market transformation.
Support the Clean Power Plan and federal climate programs	 Distributed energy resources like high-efficiency electric heating can help California integrate higher levels of renewable energy by providing demand response and energy storage, thereby supporting the state's ability to decarbonize the grid.

Accordingly, given its consistency with both AB 197, narrative objectives for prioritizing measures in the Proposed Scenario, and the importance of achieving progress in this sector to meet 2050 emission reduction goals, there is no legitimate basis for excluding building electrification from the Proposed Scenario as currently contemplated in the Scoping Plan.

The Scoping Plan Should Also Include Analysis on the Timeline, Pathway and Barriers to Achievement of Building Decarbonization Targets.

In addition to including building electrification goals in the Proposed Scenario, the Scoping Plan should provide analysis on the timeline, pathway, and barriers to building decarbonization to ensure goals are achieved by 2030. The timeline and pathway analysis could include various scenarios exploring different mixes of electrification, decarbonized fuels, pace of deployment of these technologies, by sub-sector (residential/commercial), and by end use (space heating, water heating, other gas end uses). Beyond electrification, ARB should conduct analysis on the scalability, affordability, air quality impacts, sustainability, and strategic uses of biomethane and power-to-gas to achieve 2030 and 2050 climate goals in the building sector.

In order to achieve building electrification targets, it is critical that ARB also identify

current barriers and challenges, as it has historically done to support the deployment of other technologies like electric vehicles. Construction of all-electric buildings and replacing natural gas appliances with efficient electric alternatives like heat pumps face major implementation barriers, including: (1) higher upfront and operating costs, (2) misaligned state policies and regulations, and (3) awareness and behavioral change.¹⁰ On the policy side, the state's building energy code is biased in favor of natural gas use in buildings and discourages building electrification, even when that might be the most cost-effective, most efficient, and lowest emissions option.11 Additionally, utility programs to incentivize fuel substitution from gas to more efficient electric appliances are hampered by the California Public Utilities Commission's "3-prong test," which has vague requirements and lacks guidance on which test should be performed. Since the market for heat pump water heaters and heating and cooling systems is still at an early stage in California, the economics are also a challenge. These electric technologies are in general more expensive than their natural gas versions. Many contractors do not have significant experience with installation, making them less likely to recommend electric appliances, and more likely to need extra time (and extra wages) to learn. The current Cap and Trade framework and existing policies like SB 350 will not be sufficient to lift electrification over these hurdles. As the state agency responsible for GHG policy implementation strategies, ARB has a critical role to identify the key market and policy barriers and facilitate coordinated action at the agency level to achieve building decarbonization targets in a timely and efficient manner.

The Scoping Plan Should Identify Policies and Activities Needed by Key State Agencies to Achieve Building Electrification Targets.

Building electrification will not occur at the scale described in the Alternative 1 scenario without a strong policy framework. While building electrification using high efficiency heat pumps is technologically feasible today and common in parts of the Pacific Northwest, Europe, and Japan, there are currently only a handful of cost-effective applications in California, mostly

¹⁰Energy Transitions Commission, "A new electricity era: How to decarbonize energy systems through electrification" January 2017. Also see Sierra Club Comments on the Second Update to the Climate Change Scoping Plan, December 16, 2016, for description of market transformation challenges.

¹¹For example, Title 24 of the state building code's cost effectiveness test is based on consumer cost projections which do not include societal costs of energy, and do not account for the actions that will be required to achieve the state's climate goals, such as building decarbonization.

in new construction and large-scale retrofits. ¹² In order to expand and accelerate building electrification as a GHG mitigation strategy and to achieve the targets in Alternative 1, ARB needs to signal the need for policy support from other regulatory agencies, mainly the CPUC and CEC.

Agency support will be critical to overcome policy and market transformation barriers and to unlock the potential of building electrification to curb GHG emissions. As has happened with rooftop photovoltaic, and is currently happening with electric vehicles, incentive programs and other supportive policies from ARB, CEC, CPUC, and other regulatory agencies can help to accelerate market development and transformation. With similar policies for building electrification in place, we expect equipment and installation costs to come down and performance to improve. In addition, policy reform is needed to ensure that thermal storage and demand flexibility of electric heating appliances can help with grid balancing, renewables integration, and the optimization of power plant capacity factors. The inclusion of these grid and carbon benefits in customer rates, and the reduction in equipment and installation costs as the market transforms, have the potential to make electrified buildings a very cost-effective climate mitigation strategy. By both including building electrification targets in the Scoping Plan and by identifying key activities and policy opportunities at state agencies, ARB will mobilize the level of broad support and momentum that is needed to realize our climate and air quality goals. ARB has a critical role to play to set a vision and a roadmap that the other agencies can support in order to make substantive progress on building decarbonization in the 2020 to 2030 timeframe.

We appreciate the opportunity to submit these comments and look forward to working with ARB to achieve California's 2030 greenhouse gas reduction requirements.

8

¹² Low-income retrofits with fuel-switching:

⁻Sonoma Court, 60 family apts, Escondido (HVAC and Cooking + solar)

⁻Monterrey Pines, 324 family apts, Richmond (Domestic Hot Water + solar)

⁻Deliverance Temple Phases I and II, 82 family apts, Richmond, CA (Domestic Hot Water + solar)

⁻Ethan Terrace, 92 senior apts, Sacramento (HVAC)

⁻St. Marks, 117 senior apts in a nine stories tall historical hotel, Sacramento (Domestic Hot Water)

⁻The Crossings, 100 family apts, Rialto (Domestic Hot Water + solar)

⁻The Eureka Lodge, 50 senior apts, Eureka (HVAC, DHW, Cooking)

Sincerely,

Kathryn Phillips Director Sierra Club California kathryn.phillips@sierraclub.org

Rachel Golden Senior Campaign Representative Sierra Club rachel.golden@sierraclub.org

Pierre Delforge Director of High Tech Sector Energy Efficiency, Energy & Transportation Program Natural Resources Defense Council pdelforge@nrdc.org

Brandon Smithwood Director of California State Affairs Solar Energy Industries Association bsmithwood@seia.org

Rachel Huang Director of Distributed Energy Strategy Sacramento Municipal Utility District Rachel.Huang@smud.org

Beckie Menten Director of Customer Programs Marin Clean Energy bmenten@mcecleanenergy.org

Amy Dryden
Director, Policy and Technical Innovation
Build It Green
amy@builditgreen.org

Sean Armstrong Partner and Project Manager Redwood Energy sean@redwoodenergy.net

Bruce Hodge Carbon Free Palo Alto hodge@tenaya.com

Jerry Lahr Governing Board Member Local Government Sustainable Energy Coalition jerryl@abag.ca.gov

Jennifer K. Berg Program Manager, BayREN Association of Bay Area Governments JennyB@abag.ca.gov

Ann V. Edminster
Founder and Managing Principal
Design AVEnues LLC
ann@annedminster.com

April 10, 2017

Governing Board Members California Air Resources Board (CARB) Via: Scoping Comment upload portal¹



Re: CBE Scoping Comments-Just Transition to Zero Carbon and Equity: Ramp up EVs, Stop expanding Power plants, Refineries & Dirty Crudes, Replace Trading with Direct Cuts

Dear Board Members,

CBE is a statewide Environmental Justice (EJ) organization working on energy issues including oil refineries, power plants, drilling, and on a Just Transition to clean transportation and renewable electricity. We appreciate that CARB has been reaching out on Environmental Justice in favor of directly cutting Greenhouse Gases (GHGs), and smog precursors and toxics. We also appreciate the excellent work done by the Environmental Justice Advisory Committee.

But the 40% cuts in GHGs needed by 2030 are much steeper than the 2020 targets, and the heavy reliance on pollution trading won't cut it. We urge you to replace trading with direct cuts, and more importantly, a transformation to renewable, equitable energy, addressing the following:

- Set in place a serious and detailed Just Transition plan to move fossil fuel industry jobs to zero carbon jobs, toward a clean, equitable economy. This concept was originated by trade unions for training workers and moving them out of polluting industries, and has been taken up by the EJ movement and broadened to include comprehensive plans for equitable community transformation to healthy and democratic energy economies, away from the current monopolistic systems. This is technically feasible, but needs the political will to start detailed planning.
- Zero Carbon Transportation and equity must be ramped up and made clear commitments; this would eliminate emissions from three fossil fuel sectors (vehicles, oil refineries, & oil drilling), provide storage for grid renewable energy, and eliminate most smog. Renewable transportation is making progress, but still less than 1% of vehicles, and far behind electricity, which is approaching a third renewables. CARB deserves great credit for planning 4.2 million EVs by 2030, especially facing White House hostility, but commitments are vague, and modelers indicated 6-7 million EVs by 2030 are needed. Equity in access to zero carbon transportation needs help EJ communities are heavily impacted by fossil fuels, and frequently don't have even one EV charging station.
- Refineries must 1) stop Business-As-Usual expansions and switches to Extreme Crudes,²
 2) use direct cuts and facility emission caps instead of trading, 3) face the need for gasoline production phaseout through a Just Transition plan, and 4) address emerging exports. This will also cut smog and toxics in EJ communities, where emissions have recently been found to be grossly underestimated. Currently the state is ducking the obvious need for a phaseout of the oil industry, is ignoring major expansions, and allowing cheap out-of-state offsets as a false solution.
- Big problem with encouraging "lighter" crudes—though this helps avoid extreme Tar Sands crudes, it
 encourages lighter North Dakota Bakken crudes with high methane extraction emissions, high benzene,

 $^{^1\,}https://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=scopingplan2030\&comm_period=Name=sco$

² Including Tar Sands crude, North Dakota Bakken fracked crudes, and others

water pollution, and is highly explosive. The major Tesoro Wilmington/Carson refinery expansion includes plans for a switch to large volumes of Bakken; permitting does not account for high extraction GHGs. Both heavy Canadian and light Bakken cause severe GHGs and harms; switches must be prevented. Public reporting on crude details and changes is crucial too.

- Replace inherently anti-EJ Cap & Trade with Cap & Tax revenues: CARB should provide a fair
 evaluation of Cap & Tax in detail, instead of proposing specific Cap & Trade regulations, and only
 minimal evaluation of alternatives. Cap and Trade allows oil refineries to purchase offsets and credits
 instead of making local pollution cuts, and so is inherently harmful to local EJ communities. Cap & Tax
 can provide revenues, capture the social cost of carbon, and be designed equitably and effectively.
- Stop expanding gas-fired electricity immediately, continue to decarbonize the Electricity Sector: Despite clear documentation showing the glut of gas-fired power plants in the state costing Californians billions,³ new plants are still being proposed and approved. We also need to plan phaseout of existing plants. Maximize synergistic approaches using different renewables together, including balancing abundant solar by charging EVs, and through other energy storage, aggressive energy efficiency, and Demand Response (meeting state's Loading Order priorities). Conservation is an under-utilized resource, distinct from efficiency. Although it had promise, it is time to re-evaluate an expanded Independent System Operator (ISO) now that the federal Clean Power Plans are undermined.
- Oil Extraction: CBE and EJ groups have previously commented on Oil & Gas extraction emissions, during CARB rulemaking.

 The Scoping Plan should add a Just Transition plan for workers & communities, which is necessary for carrying out the transformation to clean energy

Just Transition Recommendation:

Set in place a detailed Just Transition Plan to move fossil fuel industry jobs to zero carbon jobs, toward a clean, equitable economy.

A Just Transition plan would provide transition assistance for workers and residents in low-income communities that are disparately impacted by fossil fuel infrastructure, to be designed by each community based on circumstances and needs, including planning funding support. The fundamental transition to a "post carbon" energy system requires economic transformation away from the subsidized fossil fuel infrastructure. Where resources need to move out of polluting activities, transitory assistance may be needed, such as worker retraining programs and more. The deep decarbonization required means a major shift from "old" to "new" jobs.

The former Oil Chemical and Atomic Workers Union, CBE, and other community and environmental justice groups have long termed these policy actions collectively a "Just Transition Program." Low-

³ Californians are paying billions for power they don't need, Feb. 5, 2017, http://www.latimes.com/projects/la-fi-electricity-capacity/

⁴ Coady et al., 2015. International Monetary Fund Working Paper (<u>see</u> page 30); IMF website; <u>http://www.imf.org/en/Publications/WP/Issues/2016/12/31/How-Large-Are-Global-Energy-Subsidies-42940</u>.

income communities nearest the region's major fossil fuel industries, and workers in those plants have disproportionate needs for Just Transition support.

In particular, oil refining provides fewer direct jobs per dollar economic activity than any other sector in the statewide economy, 5 but those thousands of jobs are in the communities hosting refineries—demonstrating both disparate legacy impacts and disparate transition risks in refinery towns' local economies.

The disparate cumulative impacts of past and future pollution and economic disruption warrant focused protection. Locally-based decisions also are necessary because post-carbon energy technologies require distributed placement, for requiring local land use decisions, and because local jobs programs provide essential support for renewable and efficiency build-out.

Thus, achieving Plan goals requires the community capacity-building that Just Transition policies would provide, and it appears necessary and appropriate to fund local community actions to achieve these goals. Therefore, the Plan should include—"Community-based Just Transition Support" measures as described above.

II. Zero Carbon Transportation is essential to avoid climate destruction & cut smog, needs special attention to equity, and contradictions need clarifying

Transportation Recommendations:

- Clarify apparent contradictions in Plan, ensure transportation measures are part of <u>commitments</u> (not just generalized goals),
- Ensure high numerical commitments for ZEVs at least 6 million by 2030.
- Ensure equity access to ZEVs to address high fossil fuel burden in EJ communities.

Zero Carbon Transportation and equity must be ramped up, would eliminate emissions from three fossil fuel sectors (vehicles, oil refineries, & oil drilling), provide storage for grid renewable energy, and eliminate most smog. Renewable transportation is making progress, but still less than 1% of vehicles, and far behind electricity, which is approaching a third renewables. CARB deserves great credit for planning 4.2 million EVs by 2030, especially facing White House hostility, but commitments are vague, and modelers indicated 6-7 million EVs by 2030 are needed (with much higher goals are touched on in the Scoping Plan). Equity in access to zero carbon transportation needs help – EJ communities are *heavily* impacted by fossil fuels, and frequently don't have even one EV charging station.

Zero Carbon Transportation is perhaps the most energy-transformative measure in the Scoping Document, because it can eliminate emissions from: 1) the largest sector of GHGs and smog (transportation), in addition to 2) oil refining and 3) oil extraction; furthermore, battery ZEVs can

⁵ US Economic Census, various years. Compare California sectors employment and gross revenues data; https://census.gov/programs-surveys/economic-census/data/tools.html.

⁶ Williams et al., 2015; https://www.arb.ca.gov/research/lectures/speakers/williams/williams.htm.

provide energy storage for renewable electricity. Major cuts in fossil fueled transportation is also necessary to meet the steep GHG cuts set by SB350 and SB32 (40% GHG cuts by 2030), and necessary if we are ever to eliminate our severe smog.

CBE appreciates CARB's recognition in the Scoping Plan that Zero Carbon transportation is an essential solution to climate disaster and smog. We believe that CARB is aware of the importance of these measures. For example, the Plan states:

The growing severity of climate impacts, persistent public health impacts and costs from air pollution, and rapid technology progress that supports the expectation that cost parity between some ZEVs and comparable internal combustion vehicles will be attained in a few years, underscores the need for further action on ZEVs. Therefore, CARB solicits input on additional policies to move toward a goal of achieving 100 percent ZEV sales in the light-duty vehicle sector. Austria, Germany, India, Netherlands, and Norway are all taking steps to, or have indicated a desire to, move to 100 percent ZEV sales in the 2020–2030 time frame. [p. 100]

However, the Plan includes contradictions that indicate such plans are not clear commitments.

A. The Plan should clarify the following apparent contradictions or unclear designations, and ensure these are commitments

Below are examples of contradictions or unclear designations of commitments, sometimes identifying Mobile Source measures as commitments, otherwise stating them as not included in Plan commitments. We request clarification, and re-stating as clear commitments.

Transportation Measures: Contradictions or unclear Commitments	Commitment?	
Table II-1 (Proposed Scoping Plan Scenario) includes the 4.2 million vehicles as an existing commitment [p. 34]	Yes - Asterisk indicates "known commitments"	
Table III-3 (Estimated 2030 Cost Per Metric Ton by Measure: "Mobile Source Strategy (CFT) with Increased ZEVs in South Coast &additional reductions in VMT and energy demand & early retirement of LDVs with more efficient LDVs" [p.65]	No - Bolded measures are commitments, this measure is not listed in bold	
Ongoing and Proposed Measures – Vehicle Technology • Implement the Cleaner Technology and Fuels Scenario of CARB's Mobile Source Strategy, which includes: 4.3 million zero emission and plug-in hybrid light-duty electric vehicle by 2030 [p. 106]	Unclear – stated as ongoing & proposed	

B. Electric Vehicles goal numbers should be larger

CARB has a history of pioneering ZEV regulations that would have put California far ahead of current numbers, especially if California had not allowed the car industry to gut them in the past. (Goals of 10% EVs by 2003 were abolished -- see Who Killed the Electric Car, Revenge of the Electric Car.⁷) Now California is catching up again compared to goals set in the 1990s, still has the best programs in the nation, and must stick by its plans and expand them. The decisions made by the Detroit car industry were very unfortunate for California and for Detroit, since Detroit was in the forefront of this obvious wave of the future – Zero Carbon transit. Current moves by the Trump administration to remove California's Clean Air Act waiver for tighter standards for cars must be fought aggressively. We appreciate that CARB is standing up for California's rights to set standards to protect Californians from extreme smog and climate change.

Presentations on modeling of California's energy mix provided higher numbers of EVs for meeting SB350 40% GHG cut requirements. The Scoping Plan also generally identified higher percentages of Electric Vehicles (EVs) as appropriate goals, compared to the specific numbers identified as targets in the Scoping Plan. For instance:

- The Scoping Plan identifies 4.2 million EVs as a target for 2030 (although whether this is a clear commitment or not, is unclear) (p. 34)
- 5 million EVs were assumed in all scenarios in modeling done by E3⁸ (Presentation Renewable Portfolios for CAISO SB 350 Study, All-Agency Workshop, July 26, 2016, Sacramento, California, Slide 21⁹).
- 6-7 million EVs was identified in an earlier presentation by E3.
- The Scoping Plan generally supports other countries' goal of 100% ZEV sales for the light duty sector (p. 100) – which translates to over 25 million vehicles,¹⁰

CARB should clearly mandate significant numbers of ZEVs for 2030, at least 6 million.

C. Equity provisions need to be expanded

The SB350 Transportation Barriers study is in development, and its results will need to be implemented and included in Scoping Plan measures. CBE earlier proposed the following additions to the plan, which need to be implemented. Both the structure and the funding to provide access to renewable transportation in EJ communities is needed.

Here are the additions CBE proposed to the SB350 transportation barriers study:

⁷ http://www.whokilledtheelectriccar.com/; and http://www.revengeoftheelectriccar.com/

⁸ Energy and Environmental Economics

⁹ http://docketpublic.energy.ca.gov/PublicDocuments/16-RGO-

^{01/}TN212390 20160722T115132 Presentation on SB 350 Study 72616.pdf

Department of Motor Vehicles, 2015 shows almost 25 million registered automobiles, 2030 could presumably be much higher, although alternative options including expanded public transit, car sharing, and other options could also substantially reduce the numbers https://www.dmv.ca.gov/portal/wcm/connect/5aa16cd3-39a5-402f-9453-0d353706cc9a/official.pdf?MOD=AJPERES

- Create a more cost-effective CVRP (Clean Vehicle Rebate Project) by lowering the income
 cap and target the funding so that low and moderate income earners have more funding and
 incentives to purchase used and new ZEVs-- and use other strategies to encourage higher income
 earners to purchase ZEVs.
- Create successful <u>transformative</u> pilot programs in at least two EJ communities in California.
 Showcase success in these pilot projects (designated geographic areas) and show how this approach can be replicated in other EJ communities. For example, designate EJ areas such as the City of Huntington Park, South Gate, or West Contra Costa County, as EJ EV zones and create a 5 year strategic plan with specific targets on creating access to different clean mobility options including:
 - Create a multi-agency task-force with funding, resources and a mandate to implement the plan and reach the targets;
 - Create widespread access to charging stations at homes, businesses and public spaces in the pilot area;
 - Allocate resources for the EJ EV zone by targeted outreach and cooperation with elected offices and community-based organizations
 - Creating an effective biking and bike-sharing program in the pilot area,
 - Creating an effective EV car share program in the pilot area,
 - Work with the city planning staff to update general plans or create specific plans to prioritize active mobility options and Complete Streets;
 - Create additional incentives for people living in the EJ EV zone to take advantage of the wide range of ZEV mobility options;
 - Work with community-based organizations and academic partners to show how this "Leap-Frog" and transformative approach can be replicated in other EJ communities and inform policy moving forward.

The Greenlining Institute and Coalition for Clean Air also identified equity measures in the context of the SB350 Barriers development as follows, which CBE supports:

Providing funding, policy incentives in EJ communities for 1) Improving Access and Affordability, 2) Marketing, Education, & Outreach, 3) Jobs and Workforce Development, and more including:

- Rebates for used EVs,
- Electric transit buses, incentives and zero emission shared mobility (e.g. bike sharing and clean tech ride-sharing)
- Discounted or free transit passes,
- Community mobility needs assessments (urban, suburban, rural, density, existing
 infrastructure, access to public transportation, discount rates for underserved
 communities (e.g. credit risk buy-down, subsidized down payments)).
- Diverse payment options (e.g. cash, transit cards, EBT cards), in-person trainings, tailored customer service,

Communities for a Better Environment (CBE), April 10, 2017

- o Increase access to low-interest financing for EVs
- Increase transit service usage or efficiency via first- and last-mile mobility options (e.g., active transportation and ride-sharing services)
- o Expand and increase access to worker vanpool programs
- Target outreach and education, in key languages, partner with community organizations, work with ethnic media, hire from within community), address specific community needs, locate technologies in safe, frequently-used locations
- RFP preference points for targeting workforce training, job placement, or subcontracting small business opportunities
- Tracking and reporting individual level job data within projects
- Expand funding for pre-job training (soft skill training) and job training that can feed into clean transportation jobs.
- o Develop a low carbon transportation career map (e.g. Solar Career Map)
- More detail for jobs tracking/reporting recommendation: quantity, quality, and access
 measured using certified payroll data to extent feasible; number of workers, wages and
 benefits, job status (full/part-time, apprentice or not, length of service), worker
 demographics (race/ethnicity and gender), location (i.e., census tract).
- Ongoing analysis and policy development, expanding reach of clean mobility options, establish baselines and metrics, periodic assessment and evaluation of progress
- Maintain ongoing and create new partnerships between ARB and community-based organizations and other entities that have relationships with DAC residents and lowincome Californians.

The Scoping Plan should include such detailed equity measures in this key sector.

III. Direct Controls on Oil Refineries are needed, attention to dangerous crude oil switches, and a long-term plan for refinery phaseout with a Just Transition plan

Refinery Recommendations:

- Stop business as usual refinery expansions, allowed by regional & local permitting
- Stop **crude oil switches** to *both* heavy Tar Sands & *also lighter Bakken crude oils* (which has high GHGs during extraction, high benzene, is more explosive and water-polluting)
- > Use Direct Cuts and Facility-specific Caps instead of pollution trading
- Deeper Refinery Cuts are needed
- Begin planning for gasoline production phaseout (this can no longer be avoided), with an explicit Just Transition plan for fossil fuel workers and communities
- Emerging gasoline, diesel, and other refinery product exports must be addressed.
- Public reporting of crude oil characteristics (full assays), baselines, & changes is crucial
- Correct underestimated emissions
- A. Background Oil Refinery GHG and co-pollutant impacts are underestimated, & this sector is inherently unsafe compared to renewable transportation

This sector is arguably responsible for the worst GHG, smog precursor, and toxic impacts in the state, as the oil refining industry uses feedstocks (crude oils) that cause air, water, and explosion risk during extraction, transport, and refining, in addition to producing transportation fuels causing the biggest source of local and global air pollution. Furthermore, recent studies show local oil refining air pollution is grossly underestimated (more below).

We will be unable to meet GHG and smog precursor elimination goals without phasing out oil refining, extraction, and fossil fueled transportation. This can be accomplished in a reasonable manner through natural stock turnover, but only if this sector is not allowed to continue receiving Business-As-Usual expansion permits. A specific plan to replace our oil infrastructure over time with clean renewable energy, including a Just Transition plan for clean jobs replacement is not a far-fetched vision, but obviously necessary to avoid climate disaster and the public health disaster of smog. California continues to side step this obvious conclusion.

While the Scoping Plan is for the purpose of reducing Greenhouse Gases, it is also tasked with addressing co-pollutants. Another co-benefit of renewable transportation fuels that will replace oil refinery production, is that they are inherently safer than oil industry energy. Below are only a few photos demonstrating inherent risks of oil refineries in California that would be avoided if we stop expanding, and begin reducing and replacing this industry with renewable transportation sources.

Gradual phaseout of the Oil Industry with a Just Transition plan is not only essential to avoid Climate Disaster and Smog Hazards, but replacing with Renewable Transportation is Inherently Safer







August 2016, Tesoro LA sulfur tank explosion.

2009 Tesoro LA Coker Fire

2012 Chevron Richmond Explosion

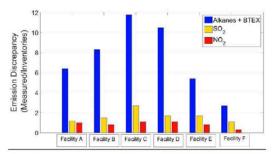


Various California refinery smoking flaring events below, and accidents above are small fraction of numbers of hazardous events

Emissions have recently been found to be grossly underestimated in a recent study that Swedish researchers carried out with the South Coast AQMD. According to reports on the study unveiled at the American Geophysical Union conference found:¹¹

Refineries in greater Los Angeles are emitting up to 12 times more toxic chemicals than previously reported, according to a new study by Swedish researchers and the South Coast Air Quality Management District. The results, which were <u>unveiled at the American Geophysical Union conference</u> in San Francisco earlier this month, have substantiated the concerns environmental justice advocates and residents of industrial cities like Torrance, Carson and Wilmington.

COMPARISON BETWEEN MEASUREMENTS AND EMISSIONS INVENTORIES



The Abstract states:12

¹¹ LA-area refineries emit up to 12 times more toxic chemicals than reported, December 29, 2016, Southern California Public Radio, http://www.scpr.org/news/2016/12/29/67663/la-area-refineries-emit-up-to-12-times-more-toxic/

¹² Quantification of Gas Emissions from Refineries, Gas Stations, Oil Wells and Agriculture using Optical Solar Occultation Flux and Tracer Correlation Methods, 12 December 2016, Authors, Johan Mellqvist, Chalmers University of Technology,

... VOC emissions from major sources such as refineries, oil wells, petrol stations oil depots and oil platforms were measured during September and October 2015 using several unique optical methods, including the Solar Occultation Flux method (SOF) and tracer correlation technique based on extractive FTIR and DOAS combined with an open path multi reflection cell.

... The results from the field campaign show that the emissions from the above mentioned sources are largely underestimated in inventories with potential impact on the air quality in the Los Angeles metropolitan area. The results show that oil and gas production is a very significant VOC emission source. . . .

This study speaks to co-pollutant smog precursor and toxics at oil refineries, which need to be accounted in CARB's EJ analysis, but could also relate to underestimation of GHGs including methane and others. CARB should add a measure to the Scoping Plan that will review oil industry emissions assessments and correct the CARB emission inventory, and co-pollutant assessment as a result.

B. Business-As-Usual refinery expansions & switches to extreme crude oil must stop; ARB should also support local measures preventing new fossil fuel infrastructure, set hard limits to expansion, and change flawed "Lighter Crude" measures

State law requires 40% GHG cuts by 2030, ¹³ but local and regional permitting has not caught up with the concept of no more Business As Usual expansions. Major refinery expansions continue to be approved at local air districts and other agencies, causing GHG and co-pollutant impacts that will last for decades. Regional agencies routinely approve all permits for expansions. But we are at a different point in history, where such fossil fuel expansions must stop and be reversed. CARB must take action to ensure local and regional permitting does not undermine state GHG goals, and also support local actions in support of local emission limits. This will also help California escape from extreme smog levels and toxics.

Pollution trading has allowed continued fossil fuel expansion, and is not the solution to cut GHGs, and certainly not copollutants. <u>A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program¹⁴ found that EJ communities contain higher concentrations of Cap and Trade -regulated sources which emit high levels of GHGs & particulate matter, and that these emissions had increased under Cap and Trade. Facilities mostly used out of state offsets to achieve reductions, rather than local direct cuts. The study also found further emissions reductions from GHG emitting facilities could enhance the public health and environmental equity.</u>

In addition to the need for state actions, there is also a need for the state to support localized evaluations and control measures:

 In the Bay Area oil refineries have attempted to bring Canadian Tar Sands crude oil in by rail, largely defeated by local community campaigns, but still threatened statewide, which would increase carbon intensity, co-pollutants, and other impacts greatly.

Jerker Samuelsson, FluxSense Inc., Ericsson Marianne, FluxSense Inc., Samuel Brohede, FluxSense Inc., Pontus Andersson, FluxSense Inc., John Johansson, Chalmers University of Technology, Oscar Isoz, FluxSense Inc., Laki Tisopulos, South Coast Air Quality Management District, Andrea Polidori, South Coast Air Quality Management District, Olga Pikelnaya, South Coast Air Quality Management District, Abstract available at https://agu.confex.com/agu/fm16/meetingapp.cgi/Paper/180782
13 Senate Bill (SB) 350 (De Leon), and SB32 xxxx

Communities for a Better Environment (CBE), April 10, 2017

147-1

10

¹⁴ <u>A Preliminary Environmental Equity Assessment Of California's Cap-and-Trade Program</u>, September 14, 2016, By Lara J. Cushing, Madeline Wander, Rachel Morello-Frosch, Manuel Pastor, Allen Zhu, and James Sadd, http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade

- In Los Angeles, the current threat is a proposed refinery expansion and crude oil switch to large volumes of Bakken crude oil. While this crude itself is light (lower carbon), it has GHG emissions from high extraction, high benzene content, and is highly explosive. It is also associated with water and soil pollution in the Dakotas, and ongoing protest over impacts in indigenous peoples/ lands. (See citations below). (CARB is proposing a Scoping Plan measure to move to lighter crudes, which although lower carbon in refining, can cause extreme emissions in extraction this should be modified to exclude switches at least to Bakken crudes.)
- A variety of site-specific measures to prevent importing extreme oil and building
 infrastructure to facilitate such imports is needed. Primary AQMD stationary source
 permitting of plant-level investment decisions requires region-specific focus, but also needs State
 support to stop business-as-usual degradation with long-term high carbon and pollution impacts
- Accounting for various extreme oil impacts (e.g., fracked oil volatiles including benzene and
 explosive qualities, tar sands refining combustion intensity, increased sulfur) requires a sitespecific focus.

Example issues are described below, and need to be addressed to avoid local / regional trends that undermine state GHG goals.

 Tesoro Wilmington's BP Carson merger, expansion & switch to Bakken crude causes high-GHG extraction & local benzene emissions—the Scoping Plan should stop such expansions that undermine 40% cuts, & modify flawed "Lighter Crude" provisions

The South Coast Air Quality Management District is poised to finalize the Tesoro Los Angeles (Wilmington/Carson refinery) Environmental Impact Report (EIR) and Title V permit for this project, despite extensive evidence regarding GHG impacts that are currently being ignored. This project will not only increase air pollution and hazardous release risk, there are also major greenhouse gas emissions increases associated with the project that are unaccounted in local permitting.

- Tesoro LA is already the largest GHG emitter statewide in the Cap & Trade program, and now proposes expansion to become the largest refinery on the West Coast. Tesoro emitted 10 million metric tons per year, with a 20% increase from the 2011/2012 period to the 2013/2014 period.¹⁵
- Tesoro Wilmington was allowed to purchase the BP Carson refinery next door against antitrust recommendations of Consumer Watchdog, without selling other refineries, based on making environmental improvements that have not come to pass, and now Tesoro and Chevron own more than half the state's refining capacity.¹⁶
- Tesoro is not retiring credits from shutting down an old Wilmington cracking unit, but
 instead is using these credits to expand other parts of the refinery, and further expanding.
 Although the Draft EIR found increased VOC emissions, it also drastically underestimated
 increases.¹⁷

 $^{^{15}}$ See Attachment A data provided by the previously cited Cushing et all study to CEJA

¹⁶ As Gas Prices Spike to Record High, Consumer Watchdog Urges California Attorney General to Block Tesoro Purchase of BP Refinery and Arco Gas Stations, 2013, http://www.consumerwatchdog.org/newsrelease/gas-prices-spike-record-high-consumer-watchdog-urges-california-attorney-general-block-t

¹⁷ SCAQMD Draft EIR for Tesoro LARIC (Los Angeles Refinery Integration Project) Project shows new project additions offset by subtractions of the FCC (Fluid Catalytic Cracker) from the Wilmington side of the refinery, for example, tables and text on

- The AQMD stated its plans to finalize the EIR, despite letters questioning the project by
 the Mayors of LA, Carson, and Long Beach, and extensive evidence submitted by EJ
 community organizations including CBE that this project is dangerous, with higher emissions,
 counter to sustainability plans and policies.
- The EIR claims there is no crude oil switch, while Tesoro's own CEO explicitly states to
 investors its plans to bring large volumes of light Bakken crude oil from North Dakota to
 Los Angeles and switch its LA refinery crude oil through this source, 18 brought first by rail
 to Vancouver Washington (which local Pacific Northwestern Mayors and officials oppose due to
 rail hazards), then by ship to Los Angeles. This would bring 360,000 barrels per day 19 to West
 Coast refineries.
- The Scoping Plan's proposal to encourage switches to "lighter" crude is counter-productive
 in the case of Bakken crude, because of high GHGs during extraction, high benzene content,²⁰
 high volatility (explosive),²¹ and other harmful qualities.
- About 25% of the new crude import by Tesoro is slated as Canadian Tar Sands crude in the Tesoro / Savage Vancouver Energy applications. As is well known, Tar Sands crude is extremely high carbon, high sulfur, and causing extreme harm during strip mining.
- These changes have impacts in California (including greenhouse gases, explosion risk, benzene
 and sulfur compound increases at refinery and more), and impacts from extraction and transport
 in Canada, North Dakota, Oregon, and Washington which must be accounted in the Scoping Plan
 EIR.

The following studies emphasize the importance of accounting for the increased GHG emissions of Bakken crude oils during extraction, and removing the encouragement for these lighter crudes from the Scoping Plan.

For example, a Harvard study²² used a top-down approach, to measure actual emissions in the

file:///C:/Users/Julia%20May/Downloads/Turner et al-2016-Geophysical Research Letters.pdf

Communities for a Better Environment (CBE), April 10, 2017

¹⁸ See Attachment B, Tesoro & AQMD Investor Statements about LA Refinery Crude Oil Switch

¹⁹ Energy Facility Site Evaluation Council, State of Washington, **Tesoro Savage Vancouver Energy Project Application No. 2013-01,** DEIS, Chapter 1 excerpt: p. 1-1, [Tesoro Savage Petroleum Terminal LLC (the Applicant) is proposing to construct and operate the Vancouver Energy Distribution Terminal Facility (the Facility, or the Project) at the Port of Vancouver (Port) in Vancouver, Washington, located on the Columbia River. The proposed Facility would be a crude oil terminal capable of receiving an average of 360,000 barrels of crude oil per day by train, storing it onsite, and loading it onto marine vessels.] <a href="http://www.efsec.wa.gov/Tesoro%20Savage/SEPA%20-%20DEIS/DEIS%20Chapters/DEIS%20Chapter

²⁰ Comments on the Draft Environmental Impact Report (DEIR) for the Tesoro Los Angeles Refinery Integration and Compliance Project, Los Angeles, California, Phyllis Fox, Ph.D., PE, June 10, 2016, which includes the following information as examples. Full comments were submitted to the SCAQMD as part of the Draft EIR public comments, and found Tesoro was switching to Bakken crude oil, modifying the refinery to this end, and that Bakken contained higher benzene concentrations - for example: "upper bound benzene concentration in Bakken crude (7%)" at p. 47, also 5-7% MSDS reported p. 45.

²¹ ATTACHMENT C – US DOT Warned Bakken Crude Explosive, Fire Risk

²²Turner, A. J., D. J. Jacob, J. Benmergui, S. C. Wofsy, J. D. Maasakkers, A. Butz, O. Hasekamp, and S. C. Biraud (2016), A large increase in U.S. methane emissions over the past decade inferred from satellite data and surface observations, Geophys. Res. Lett., 43, 2218–2224, doi:10.1002/2016GL067987, available at:

atmosphere (unlike EPA's bottom up calculations), and which showed emissions much higher than expected. A large increase in U.S. methane emissions over the past decade inferred from satellite data and surface observations (Harvard, February 2016) found a major spike in worldwide methane emissions over the last decade, and found the U.S. the likely culprit: "Our results suggest that increasing U.S. anthropogenic methane emissions could account for up to 30–60% of this global increase."

It also found this has coincided with an in oil and gas production increase, and especially an increase in shale gas production ("The U.S. has seen a 20% increase in oil and gas production [US EIA, 2015] and a nine-fold increase in shale gas production from 2002 to 2014") although it did not have enough data to determine the exact U.S. sources. Discussions of this study described its importance: "There was a huge global spike in one of the most potent greenhouse gases driving climate change over the last decade, and the U.S. may be the biggest culprit, according a new Harvard University study." ²³

Other recent studies also found extremely high levels of methane gas leakage from oil and gas drilling operations. For example, the Science Journal *Nature* reported as follows:²⁴

"We were expecting to see high methane levels, but I don't think anybody really comprehended the true magnitude of what we would see," says Colm Sweeney, who led the aerial component of the study as head of the aircraft programme at NOAA's Earth System Research Laboratory in Boulder.

The Scoping Plan must be modified to include measures to prevent such harms from such crude oils, which while they can be light (low carbon) like Bakken, can cause very high extraction emissions. The Scoping Plan EIR must also be modified to ensure it does not actually encourage switches to such lighter crudes, as in the Tesoro case. It should remove the blanket concept encouraging switches to "lighter" crudes, and support communities working to stop harmful impacts from North Dakota Bakken crudes that will hurt LA EJ communities, communities in the Pacific Northwest, and communities in North Dakota. (Tesoro is also connecting its extensive North Dakota pipelines to the notorious Dakota Access pipeline.) California must be responsible for in and out of state impacts of our regulations, particularly in EJ and indigenous communities.

Support Bay Area Refinery Emissions Caps—And the need to tailor this precedent-setting policy to site-specific conditions in other regions

Five major Bay Area oil refineries collectively emit more particulate (PM_{2.5}) and GHG (CO₂e) air pollution than any other industry in the Bay Area Air Quality Management District. Finding none of these plants has an overall mass emission limit that applies to the entire refinery, and plans to expand long-lasting capacity for increasing production and lower quality oil feeds could increase refinery emissions, BAAQMD began work to develop a "backstop" against increasing refinery emissions in 2012.²⁵ In 2014 the BAAQMD Board voted unanimously to develop Rule 12-16 to set this backstop.²⁶

Rule 12-16 would establish refinery level emission "caps"—numeric limits on facility-wide annual mass

Communities for a Better Environment (CBE), April 10, 2017

²³ Study Ties U.S. to Spike in Global Methane Emissions, *Published*: Feb 16, 2016, Climate Central, *Researching and reporting the science and impacts of climate change*, http://www.climatecentral.org/news/us-60-percent-of-global-methane-growth-20037

²⁴ Nature News, 02 January 2013, available at: http://www.nature.com/news/methane-leaks-erode-green-credentials-of-natural-gas-1.12123, Attachment 28

²⁵ <u>See BAAQMD's 2012</u> "Refinery Emissions Tracking" Concept Paper.

²⁶ BAAQMD Resolution 2014–07.

emissions of CO₂e, PM_{2.5}, PM₁₀, and the PM precursors NOx and SO₂. BAAQMD plans to consider adopting proposed Rule 12-16 on May 17, 2017.

Independent analysis confirms that the regional industry is acting on its plans to expand long-lasting infrastructure for higher-emitting grades of oil and estimates that, in the plausible worst case "tar sands" oil scenarios, region-wide refinery GHG and particulate emissions could increase by 40–100 percent.²⁷ Other measures may cut only 20 percent from current refinery emission rates, BAAQMD estimates.

Given the urgency of this measure and the ferocity of opposition by the oil industry, it is important to note that, tailored to local conditions, the measure is effective at zero cost. Designed to prevent significant, potentially irreversible increases in refinery emissions so that other measures can more effectively reduce emissions, the refinery-level caps limit each facility's emissions to 107 percent of its maximum annual emissions over the past five years. Each facility emitted below these limits throughout this five-year period. The refiners met these emission limits while the Bay Area industry outpaced domestic fuels demand, exporting 11 percent of its fuels production, ²⁸ and ran at essentially full crude production capacity, ²⁹ during various years in this period.

CBE appreciates the Air Resources Board's recent statement of support for Rule 12-16,³⁰ and offers two recommendations to address the resultant need for updating the Scoping Plan to include this necessary complement to the Plan's other measures. First, the Plan should include BAAQMD Rule 12-16 explicitly while recognizing that this precedent-setting policy for preventing extreme oil expansion should be tailored to local conditions which may differ among the state's refining regions. Second, it should include Staff's recent finding that mass/year caps complement mass/barrel (carbon intensity) caps.

CARB should evaluate this measure for other Districts, but this needs to account for different conditions, particularly in the South Coast. For example, the Bay Area has been at greater risk of switches to Canadian Tar Sands crude, while the current biggest extreme crude oil threat to the South Coast is Bakken crude oil, which is lighter, but with multiple other extreme impacts, including high extraction emissions. Other conditions may be different in the South Coast and need to be analyzed. Regardless, the concept of adopting measures to limit oil refineries to current emission levels is valid statewide, and must be applied to all refineries, after more specific analysis on local conditions.

C. Direct and & Deeper Refinery Emissions Cuts are needed; AB 197 requires this

Assembly Bill 197 (E. Garcia, 2016) requires prioritizing Direct Emissions cuts Specific measures we recommend adding include the following.

²⁷ <u>See</u> CBE's 2 December 2016 technical report to BAAQMD regarding Rule 12-16 CEQA issues.

²⁸ Based on 2013 gasoline, diesel and jet fuel production and exports reported by the US EIA.

²⁹ The Bay Area industry's <u>annual average</u> 2014 crude rate reported by the California Energy Commission is 98% of its collective maximum <u>calendar-day</u> capacity reported by the US EIA.

³⁰ April 5, 2017 letter from Richard Corey, CARB, to Jack Broadbent, BAAQMD.

1. Deeper Refinery Emission Cuts Are Feasible And Necessary By 2030.

Refinery emissions can be cut more than 40% by 2030 if the amount of oil refined (refinery production) and the amount of GHG emitted per barrel refined (refinery carbon intensity) are each reduced by 25%. Statewide refinery production can be reduced more than 25% by 2030 through measures discussed above to reduce gasoline and diesel use statewide and to stop expanding capacity for refined products export. Statewide refinery carbon intensity can be reduced more than 25% by 2030 through combinations of feasible measures, such as converting from fossil fueled hydrogen production to make hydrogen by splitting water—a demonstrated technology that could use clean electricity by 2030—along with the other measures described below. Meeting the average carbon intensity already achieved nationwide (\approx 43 kg CO₂/barrel oil refined)³¹ would cut \approx 22% from current statewide refinery carbon intensity in 2015 (\approx 55 kg/b), ³² and converting to zero emission hydrogen alone could cut statewide refinery carbon intensity by \approx 32%, ³³

Allowing refiners to get away with cutting less than their fair share of total emissions by 2030, only 20–30%, as now proposed, could unfairly increase costs to other sectors which then must make even deeper cuts by 2030. Worse, it would risk failure to meet the 40% economy-wide emission reduction goal by then. Worse still, it would unfairly prolong disparate GHG co-pollutant impacts in communities near refineries.

The Plan, therefore, should target refinery emission cuts of at least 40% by 2030.

2. Remove methane exemptions from Smog Regulations

Comments submitted to CARB by CBE in May of 2008 on the Scoping Plan identified, based on CARB data, methane emissions that are exempt from regulation. For example, three categories of Stationary Sources listed (Fuel Combustion, Petroleum Production and Marketing, and Industrial Processes) emitted about 466 tons per day (about 170,000 tons methane per year) of exempt compounds, which is likely to be mostly methane. This was about 4 million tons CO2e per year.

There is no longer any reason to continue exempting methane from smog standards emissions, either for smog, or for GHG impacts. It is now known that methane is a considerable contributor to smog, as also discussed in our earlier comment. A Harvard study, *Linking ozone pollution and climate change: The case for controlling methane*³⁴ found:

"Methane (CH4) emission controls are found to be a powerful lever for reducing both global warming

³¹ From 257.4 MM MT CO₂ emitted and 16.4 MM b/d crude refined by US refineries in 2015; <u>see</u> tables 11 and 19 in the US EIA's Annual Energy Overview; <u>www.eta.gov/outlooks/aeo/er/tables_ref.cfm</u>.

³² From 33.4 MM MT emitted by California refineries and their 3rd party hydrogen plants in 2015; CARB; (www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm) and 605 MM b/y crude refined by California refineries in 2015; CEC; (https://www.energy.ca.gov/almanac/petroleum_data/fuels_watch/).

³³ From 33.4 MM MT emitted in 2015 (<u>see</u> note above) and 10.6 MM MT emitted from refiner-produced and purchased hydrogen estimated based on 2015 hydrogen capacity (SMR) data from the *Oil & Gas Journal* using the methods reported in Karras, 2010 (DOI: 10.1021/es1019965).

³⁴ Fiore, et al, Harvard University, 2002

and air pollution via decreases in background tropospheric ozone (O3)"

The report was summarized in Environmental Science & Technology, Dec. 1, 2002:

"Aggressive efforts to improve urban air quality could be undermined by rising levels of methane, a compound more closely linked to global warming than air pollution. Using a global model of tropospheric chemistry, researchers at Harvard University, Argonne National Laboratory, and the U.S. EPA determined that higher methane levels could increase ozone background levels worldwide, lead to a greater frequency of days with high ozone levels in the summer, and produce a longer "season of ozone pollution days."

"It is already known that methane is a major source of worldwide tropospheric ozone background concentrations, and this study supports that finding. However, the surprise is that a 50% reduction in anthropogenic methane in their scenario is as effective as a 50% drop in anthropogenic NOx concentrations at lowering summer afternoon ozone levels over the United States" (page 452A)

NOAA (National Oceanic and Atmospheric Administration) also found:35

Linking climate and air pollution: Methane emission controls yield a double dividend

An important area of research at GFDL is investigating the contribution of methane to surface ozone pollution, and quantifying the potential benefits to air quality and climate from controls on methane emissions. Methane is both a greenhouse gas and an important contributor to background levels of ozone. Tropospheric ozone, a significant greenhouse gas and the primary constituent of photochemical smog, provides an obvious link between air quality and climate.

CARB should remove methane exemptions for all sources in the state, including transportation sources. CBE proposed this, and CARB found it to be a feasible reduction measure, but never implemented it. Now CARB should evaluate adding this measure as a complementary reduction, and as an alternative to the current Cap and Trade proposal, in order to achieve the maximum technologically feasible reductions.

CARB should also direct Air Districts to remove exemptions for methane.

We proposed direct cuts for Refinery Boilers & Heaters in earlier Scoping Plans, but these
were instead folded into Cap & Trade program – CARB can and should prioritize these
Direct cuts now

A driving source of oil refinery energy use is Boilers and Heaters, with associated substantial NOx, SOx, VOCs, and particulate matter. CBE proposed direct cuts on Boilers and Heaters in earlier Scoping Plan comments, ³⁶ but options for controlling these sources was instead folded into the Cap and Trade program, and CARB ceased considering requiring direct controls on these sources.

CARB evaluated Department of Energy Data on industrial boilers and heaters and found it cost-effective for Boilers to: replace low and medium efficiency boilers, reduce excess air, retrofit feedwater economizers, retrofit air preheaters, reduce blowdown with controls and feedwater cleanup, provide

³⁵ http://www.research.noaa.gov/spotlite/2006/spot_methane.html

³⁶ CBE Comments on Draft Cap and Trade Regulation: Draft Cap & Trade Regulation Misses California GHG and Pollution Reduction Opportunities, Job Opportunities, and Contains Egregious Errors, December 14, 2010, and Communities for a Better Environment's Comments on ARB's Supplement to the AB 32 Scoping Plan FED, July 28, 2011

blowdown heat recovery, optimize steam quality and condensate recovery, minimize vented steam, maintain insulation, steam traps, prevent leaks; and for Heaters to: replace low and medium efficiency Heaters, optimize Heaters, recover flue gas heat, replace refractory brick, maintain insulation.³⁷

CBE compiled the CARB data and found the following total GHGs, and calculated NOx and CO copollutants using AP42 emissions factors. These reduction measures in total were estimated to achieve about 4 million TCO2E/year, and *save* about \$46 million dollars, as shown in the following charts excerpted from the data CARB provided. This would also have cut about 24 tons per day of NOx, and 8 tons per day of CO. Although these are substantial emissions, they could very well be underestimated. **The GHG total is more than the entire amount of reductions listed by CARB for oil refineries in the current Scoping Plan** (1-3 million tonnes CO2equivalent³⁸). By contrast, CARB lists 45-100 tonnes of GHG cuts for Cap and Trade.

The Scoping Plan should be amended to include specific measures including requiring meeting BACT / LAER (Best Available Control Technology / Lowest Achievable Emissions Rate) for Boilers & Heaters.

4. Strictly Prohibit Use of Cap-and-Trade By Refineries That Emit At High Carbon Intensity, Use High Carbon Intensity Oil Feedstock, Export Refined Products, or Contribute to Disparately Severe Local Impacts.

Several intrinsic flaws of economy-wide pollution trading schemes could result in especially serious negative impacts if the state continues to apply its cap-and-trade scheme to California oil refineries:

- Greater refinery carbon intensity. California refineries have increased the global carbon intensity of oil refining. Statewide refinery carbon intensity (≈ 55 kg CO₂/barrel oil refined)³⁹ is ≈ 28% greater than the average nationwide (≈ 43 kg CO₂/b)⁴⁰ now, and threatens to worsen. Refiners themselves⁴¹ assert plans for long-lasting new infrastructure which could further increase emissions they plan to sanction under cap-and-trade. Refiners profit from dirty fossil hydrogen (used to refine higher-emitting oils) at up to 80 times⁴² the carbon price set by cap-and-trade, which, as predicted in 2007,⁴³ results in disproportionate purchases of carbon credits from other sectors by refiners.⁴⁴
- Increased extraction impacts of imported oils. Emissions from the extraction and production of
 fracked oils such as North Dakota "Bakken" and "synthetic" tar sands crude can be much greater than

³⁷ Compliance Pathways Analysis – Boilers, available at

http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathboiler.xls and Compliance Pathways Analysis – and Process Heaters, available at http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathprocessheat.xls

³⁸ Table III-1. Ranges of Estimated GHG and Air Pollution Reductions by Policy or Measure in 2030, Scoping Plan, at p. 29.

³⁹ From 33.4 MM MT emitted by California refineries and their 3rd party hydrogen plants in 2015; CARB;

^{(&}lt;a href="www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm">www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm) and 605 MM b/y crude refined in 2015; CEC; http://www.energy.ca.gov/almanac/petroleum_data/fuels_watch/).

⁴⁰ From 257.4 MM MT CO₂ emitted by US refineries and 16.4 MM b/d crude refined in 2015; <u>see</u> tables 11 and 19 in the US EIA's Annual Energy Overview; <u>www.eta.gov/outlooks/aeo/er/tables_ref.cfm</u>.

⁴¹ <u>See</u> refiners' comments and staff analysis of comment on proposed BAAQMD Rule 12-16.

⁴² Up to \$800/tonne: <u>see</u> Shaner et al., 2016. Energy Environ. Sci. DOI: 10.1039/cSee02573g.

⁴³ Farrell and Sperling, 2007. A Low-carbon Fuel Standard for California, Part 1: Technical Analysis–Final Report; www.energy.ca.gov/low-carbon-fuel-standard. See pp. 22–24.

⁴⁴ Cushing et al., 2016; http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade.

those of typical "conventional" crude. 45 Cap-and-trade exempts these emissions that occur outside of the state. California refineries import more than half the crude they process, 46 and plan expansions of capacity to import more of these high-carbon oils from outside of the state.

- Increased impacts of refinery production for export. Instead of reducing production as we begin to use less of their fuels here, refiners here have increased production for export. ⁴⁷ Bay Area refineries exported 11% of their combined gasoline, diesel, and jet fuel production in 2013. ⁴⁸ Burning the gasoline, distillate-diesel, and petroleum coke West Coast refiners export as of 2016 emits ≈ 50 million tonnes/year of CO₂. ⁴⁹ California refineries account for most of these "exported" emissions. Cap-and-trade exempts these out-of-state emissions entirely.
- Disparately severe impacts on disadvantaged communities. Locally toxic refinery emissions are
 correlated with refinery GHG emissions⁵⁰ and cause disparately severe health risks in nearby low
 income communities of color.⁵¹ Cap-and-trade does not account for these impacts, and allows these
 impacts to worsen by allowing refineries here to increase emissions from excess production for
 export and from burning more fuel/barrel refined than the average US refinery.

Each of these consequences of applying cap-and-trade to refineries would fail to achieve the maximum feasible GHG emission reductions, fail to protect disparately impacted disadvantaged communities, or both. Thus, the Plan should prohibit the use of cap-and-trade by any refinery in each and all of these situations explicitly.

IV. Cap & Trade is defective and inequitable – CARB should provide a detailed assessment for replacing revenues with Cap & Tax

Cap & Trade Recommendation:

Provide detailed evaluation of Cap & Tax options, delete Cap & Trade from Scoping Plan.

CBE opposes pollution trading because it is ineffective and inequitable. It allows continuing, and expanding heavy concentrations of pollution in EJ communities, without providing effective GHG cuts. Major polluters are allowed to buy their way out of making serious pollution cuts. Cap & Trade also puts off the real work we must do to decarbonize our energy systems, to avoid catastrophic climate change, and to finally eliminate our public health disaster of smog. It gives a false sense that we are making progress to address climate change.

⁴⁵ Gordon et al., 2015; http://carnegieendowment.org/2015/03/11/know-your-oil-creating-global-oil-climate-index-pub-59285.

⁴⁶ CEC; http://www.energy.ca.gov/almanac/petroleum data/statistics/crude oil receipts.html.

⁴⁷ EIA finished pet. prods. data; www.eia.gov/dnav/pet/pet sum snd d r50 mbblpd m cur.htm.

⁴⁸ From PADD 5 Transportation Fuels Markets; www.eia.gov/analysis/transportationfuels/padd5.

⁴⁹ From EIA fin. pet. prods. data (<u>see</u> note above) and CARB default emission factors (Table 1; <u>www.oal.ca.gov/CCR.htm</u>), except coke emission factor from DOI: 10.1021/es1019965 (SI data).

 $^{^{50} \}underline{\text{https://oehha.ca.gov/search/tracking\%20and\%20evaluation\%20of\%20benefits\%20and\%20impacts\%20of\%20ghg\%20limit}$

⁵¹ <u>See</u> Brody et al., 2009. Am. J. Public Health; DOI: 10.2105/AJPH.2008.149088; and Pastor et al., 2010; Minding the Climate Gap; https://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade.

CBE has submitted many detailed comments during previous Scoping Plan proceedings documenting ineffectiveness and harms of pollution trading. Please see many comments submitted to CARB by CBE in earlier Scoping Plan and Cap & Trade regulation proceedings. CBE also supports comments made by CRPE, CEJA, and the EJAC on the Scoping Plan regarding harms of Cap & Trade, need for evaluation of alternatives including Cap & Tax.

Harms and ineffectiveness of Cap & Trade shown in many studies in the European and other pollution trading programs, have been repeated in the California program, as in the previously cited Cushing et all study.

First, California allowed free credits, keeping prices down, and providing a glut of credits. Allowing banking of credits set up years of over-abundance and low prices. And pollution credits and especially offsets allow trading between very different pollution sources (e.g. avoiding cuts in local oil refinery emissions by purchasing far-distant forestry measures). The complex calculations yield dubious results by trying to equate a calculated amount of oil refinery equipment emissions to a calculated amount of forestry protections. Such results are fraught with problems resulting in trading emissions not-equivalent in magnitude, constituency (co-pollutants such as toxics), or location. This is another reason why Direct Reductions are far more effective – when you eliminate a pollution source through direct pollution prevention measures, you know the pollution is gone, and you know the location of the cuts.

Instead, we urge direct emissions cuts and a transformation out of fossil fuels. California has however, set up the system so that many now depend on revenues generated by Cap & Trade. These revenues are still needed, and a Cap & Tax program could much more effectively provide revenues, and provide funding for a Fossil Fuel phaseout / Energy Transformation to clean renewables.

We support a Cap & Tax measure to replace Cap & Trade revenues. California needs a price on carbon that can incentivize behavior changes at firms by sending a strong price signal, while incorporating the full environmental and social costs of carbon emissions. A direct price ensures that California businesses have price certainty and incentives to innovate. It also ensures that revenue stays in-state, without going to traders and projects elsewhere. The price should be set at the social cost of carbon. It should initially be discounted, with adjustments for annual inflation and a set price trajectory of increases to reach the full cost.

V. The Electricity Sector is pivotal & making progress, but we need a No New Gas policy, shut down of existing gas plants, and maximizing Renewables, Demand Response, Energy Storage, Efficiency, and Equity without Pollution Trading

Just Electricity recommendations:

- Plan for a fossil-fuel free grid, with a specific emphasis on environmental justice in siting, operational assumptions, and planning
- Prioritize meaningful community engagement and transparency in electricity system and electricity resource decision-making
- Direct the benefits, especially economic, system resilience, and pollution reduction benefits, of renewable distributed generation in environmental justice communities
- Implement operational controls that reduce pollution impacts of existing electricity system, with a focus on environmental justice communities.

The Electricity Sector is key to fossil fuel phaseout in the state, because the grid can be decarbonized, and it can also support other sectors' decarbonization. Specifically, the electricity grid can provide non-fossil fueled electricity (solar, wind), but can also provide this decarbonized electricity to vehicles, and conversely can use EV batteries for grid storage / balancing.

California authorities have generally adopted the concept of this approach, through the pillars of decarbonization (Aggressive Energy Efficiency, Decarbonize the Grid, and Electrify Transportation and industry). The strategy was first laid out in *The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity, 52* as the three pillars it identified in order to economically meet 80% GHG cuts. This and later studies demonstrated the economic and technical feasibility, without Pollution Trading:



In order to plan and transform our electricity grid, CBE, CEJA (California Environmental Justice Alliance), and coalition partners have taken part extensively in CPUC (California Public Utilities Commission) Long Term Planning and CEC (California Energy Commission) power plant permitting processes, to ensure prioritizing energy procurement according to the state Loading Order (for example with efficiency and renewables first). We have also intervened extensively in these processes and in the legislature, for equitable access of EJ communities to clean energy, as well as to protect communities from unnecessary gas-fired procurement. We will not attempt to replicate the detailed and extensive comments we have submitted to the CPUC, CEC, and seeking new laws, but instead provide general concepts here. These include:

- Stop expanding gas-fired electricity immediately, continue to decarbonize the Electricity Sector: Despite clear documentation showing the glut of gas-fired power plants in the state costing Californians billions, ⁵³ new plants are still being proposed and approved.
- Plan to phaseout existing plants (first don't replace gaining or Once Through Cooling plants with gas adhere strictly to the Loading Order and to the extent that replacement generation is needed, prioritize local distributed generation.)
- Maximize synergistic approaches using different renewables together, including balancing abundant solar by charging EVs, and through other energy storage, use aggressive energy efficiency, and Demand Response, in line with the state's Loading Order priorities. (The grid can

⁵² Williams, et al, *Science*, 2010, 06 Jan 2012: Vol. 335, Issue 6064, pp. 53-59, DOI: 10.1126/science.1208365, http://science.sciencemag.org/content/335/6064/53.full

⁵³ Californians are paying billions for power they don't need, Feb. 5, 2017, http://www.latimes.com/projects/la-fi-electricity-capacity/

- help provide electricity for EVs, and EVs can help store extra-abundant solar.) Out of state electricity must meet California's environmental and environmental justice mandates.
- The appeal of sharing electricity beyond California must be informed by vigorous
 protections to ensure that California's environmental and environmental justice values
 inhere in any broader system. Concerns about accounting for GHG emissions from out of state
 generation have already arisen. It is vital that regardless of where California's electricity is
 produced or used, the benefits of our transition follow.
- Distributed generation provides significant system and community benefits that must be valued and prioritized:
 - Local renewable distributed generation allows targeted generation in load pockets and where it is most needed
 - Local renewable distributed generation avoids transmission costs and the fragility of the aging transmission system
 - Well-designed distributed generation allows for clean grid management. As mentioned above, when paired with Smart Inverters, distributed generation can provide the highvalue functions of gas-fired generation to respond to fast-changing grid conditions.
 When paired with storage, distributed generation can balancing the grid to address the duck chart.
 - Distributed generation can provide local clean energy careers including marketing, installation, maintenance, and many other job categories to build community wealth.
- Many technical solutions are available to make renewables appear like gas-fired generation for grid support:
 - Smart Inverters for rooftop solar can provide control capabilities include ramp rate, curtailment, power factor (volts-amp reactive support) and on/off functionality. The ability to remotely control an inverter's output characteristics minimizes the adverse impacts of solar power as an intermittent source of energy, and allows for increased grid penetration.⁵⁴ Germany has required retrofits of its grid to add Smart Inverters, California should get such requirements in early before the even higher coming rooftop solar boom.
 - Reactive Support at key locations can replace the need for reactive power gas-fired generators currently provide

⁵⁴ For example: Advanced Energy, Laying the Foundation for the Grid-Tied Smart Inverter of the Future, at 5 (2011), available at http://solarenergy.advanced-energy.com/upload/File/White_Papers/SEGIS-Laying%20the%20Foundation-2-FINAL.pdf (emphasis added). Many other publications, including utility and FERC statements ascribe such grid support capabilities to Smart Inverters.

VI. Conclusion

CBE appreciates CARB's work on these key issues, and urges the above additional actions.

Sincerely,

Julia May, Senior Scientist, CBE (Communities for a Better Environment)

Greg Karras, Senior Scientist, CBE

Bahram Fazeli, Research and Policy Director, CBE

Roger Lin, Staff Attorney, CBE

Shana Lazerow, Staff Attorney, CBE

Jose Lopez, Staff Researcher, CBE

Attachments

ATTACHMENT A - Refinery Data provided by Cushing et al Study to CEJA

Refinery	Emitter covered	Emitter covered GHG	Change in emitter	% change
	GHG emissions,	emissions, 2011-12	covered GHG	relative to
	2013-14	(metric tons CO2eq)	emissions, 2013-14	2011-12
	(metric tons		vs. 2011-12	
	CO2eq)		(metric tons CO2eq	
Tesoro Refining & Marketing	10,776,883	8,983,862	1,793,021	20%
Company LLC - Los Angeles				
Refinery - Carson				
Tesoro Refining and	4,778,043	4,490,437	287,606	6%
Marketing Co Martinez				
Phillips 66 Company - Los	1,892,589	1,796,159	96,430	5%
Angeles Refinery - Carson				
Plant				
Phillips 66 Company - Los	3,933,130	3,852,141	80,989	2%
Angeles Refinery - Wilmington				
Plant				
Phillips 66 Company - Santa	502,518	479,929	22,589	5%
Maria Refinery		,		
Kern Oil Refinery	286,515	275,632	10,883	4%
Lunday-Thagard Company	70,102	62,965	7,137	11%
San Joaquin Refining	187,437	187,444	-7	0%
Company		A-AA-0-20-00 00 00		***************************************
Edgington Oil Company	11	461	-450	-98%
Ultramar Inc – Valero	1,870,699	1,927,135	-56,436	-3%
Chevron Products Company -	6,527,778	6,646,701	-118,923	-2%
El Segundo Refinery, 90245		The Part of the Part of the State of the Sta	0-1-00 Para y tor	
Valero Refining Company -	5,447,322	5,577,029	-129,707	-2%
California, Benicia Refinery				
and Benicia Asphalt Plant				
Shell Oil Products US -	8,158,766	8,316,879	-158,113	-2%
Martinez				
Phillips 66 Company - San	2,639,333	2,822,075	-182,742	-6%
Francisco Refinery				1,550
Paramount Petroleum	58,855	253,431	-194,576	-77%
Corporation Refinery	,			
Alon Bakersfield Refinery -	50,804	322,112	-271,308	-84%
Areas 1&2		/	, , , , , , , , , , , , , , , , , , , ,	
ExxonMobil Oil Corporation -	5,864,802	6,152,615	-287,813	-5%
Torrance Refinery		,= - /		
Chevron Products Company -	8,034,694	8,407,150	-372,456	-4%
Richmond Refinery, 94802	, , ,	, ,		

ATTACHMENT B - Tesoro & AQMD Investor Statements about LA Refinery Crude Oil Switch

Tesoro tells people in LA the refinery expansion is for clean air	But Tesoro tells investors it is switching the LA Refinery to N. Dakota Bakken crude oil.
Nature of the Project is for Clean Air:	Nature of the Project is a Crude Oil switch on the West Coast & specifically in the LA Refinery to N. Dakota Bakken: ⁵⁵
"Pending permitting and approvals, the Los Angeles Refinery Integration and Compliance (LARIC) project will improve air quality, substantially reduce local emissions, upgrade refinery equipment and provide significant benefits to the local economy."	Paul Y. Cheng - Barclays Capital - Analyst Okay. In Carson [Los Angeles], I think before being acquired by you guys, that they were running largely you said 56 ANS, maybe 100,000 barrel per day. And then maybe another 100,000 of the Iraqi Basra 57. Is the crude slate changed now? Or that is essentially secured by the same crude slate as in the past? Gregory J. Goff – Tesoro Corporation – President & CEO Basically the same. We are running some different crudes there, but not material differences at this point in time. It is in our plans to do that. Basically what you described, is the bulk of the crude supply the two sources what is happens in the Los Angeles refinery today. Paul Y. Cheng - Barclays Capital - Analyst Right. Greg, how quickly that you think you may start to be able to change the
EIR:	crude slate to do that? ⁵⁸
Draft EIR covers up the Nature of the Project & Crude Oil Switch for Tesoro:	Gregory J. Goff – Tesoro Corporation – President & CEO – "The first thing, our intention at the Port of Vancouver to be able to do that." (emphasis added) Paul Y. Cheng - Barclays Capital - Analyst You have to wait until the Savage terminal's 59 up and running before you can
"While the proposed project does not affect the types of crude oils processed at the Refinery and, thus, will not have impacts due to changes in crudes, the proposed project may increase downstream unit	actually do that? Gregory J. Goff – Tesoro Corporation – President & CEO That would allow us to move the most significant volume right now if we do that. We are looking at other things on an ongoing basis to be able to move crudes there. But we have a number of things that we're looking at, but that is the primary way that we want to be able to improve crude supply cost at the Los Angeles facility. (emphasis added)
processing rates on a monthly or daily basis."61	Most recently, Tesoro confirmed its plans to import crudes from the Vancouver Terminal to the Los Angeles Refinery in response to a question on the connection between the integrated Los Angeles Refinery and the Vancouver Terminal: Gregory J. Goff – Tesoro Corporation – President & CEO - "We have said that once Vancouver Energy is up and operating, we'll use crude oil into the facility to supply our west coast operations but there's no connection to the permits." 50

⁵⁵ Thomson Reuters Streetevents Edited Transcript, TSO – Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014 (Q1 2014 Tesoro Earnings Call), Barclay Capital questions at pp. 12-13. There are some discrepancies between the Thomson Reuters transcript and the original webcast. The recording of the original webcast is available.

^{56 &}quot;you said" mistranscribed as "essential"

⁵⁷ "Basra" mistranscribed as "basket".

^{58 &}quot;slate to do that" mistranscribed as "slated to buy it?"

^{59 &}quot;Savage terminal" mistranscribed as "terminal".

⁶⁰ Tesoro, 2016 Tesoro Corporation Earnings Conference Call Recording, May 5, 2016, 41:39 – 41:50 minutes, Exhibit 5a; Available at: http://edge.media-server.com/m/p/56vao56c; Thomson Reuters Streetevents Edited Transcript, TSO – Q1 2016 Tesoro Corporation Earnings Conference Call, May 5, 2016, p. 14.

⁶¹ Draft EIR, at p. 4-2

ATTACHMENT C – US DOT Warned Bakken Crude Explosive, Fire Risk



The Pipeline and Hazardous Materials Safety
Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
www.phmsa.dot.gov

Safety Alert -- January 2, 2014

Preliminary Guidance from OPERATION CLASSIFICATION

The <u>Pipeline and Hazardous Materials Safety Administration</u> (PHMSA) is issuing this safety alert to notify the general public, emergency responders and shippers and carriers that recent derailments and resulting fires indicate that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude oil.

Based upon preliminary inspections conducted after recent rail derailments in North Dakota, Alabama and Lac-Megantic, Quebec involving Bakken crude oil, PHMSA is reinforcing the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify hazardous materials prior to and during transportation. This advisory is a follow-up to the PHMSA and Federal Railroad Administration (FRA) joint safety advisory published November 20, 2013 [78 FR 69745] As stated in the November Safety Advisory, it is imperative that offerors properly classify and describe hazardous materials being offered for transportation. 49 CFR 173.22. As part of this process, offerors must ensure that all potential hazards of the materials are properly characterized.

Proper characterization will identify properties that could affect the integrity of the packaging or present additional hazards, such as corrosivity, sulfur content, and dissolved gas content. These characteristics may also affect classification. PHMSA stresses to offerors the importance of appropriate classification and packing group (PG) assignment of crude oil shipments, whether the shipment is in a cargo tank, rail tank car or other mode of transportation. Emergency responders should remember that light sweet crude oil, such as that coming from the Bakken region, is typically assigned a packing group I or II. The PGs mean that the material's flashpoint is below 73 degrees Fahrenheit and, for packing group I materials, the boiling point is below 95 degrees Fahrenheit. This means the materials pose significant fire risk if released from the package in an accident.

As part of ongoing investigative efforts, PHMSA and FRA initiated "Operation Classification," a compliance initiative involving unannounced inspections and testing of crude oil samples to verify that offerors of the materials have been properly classified and describe the hazardous materials. Preliminary testing has focused on the classification and packing group assignments that have been selected and certified by offerors of crude oil. These tests measure some of the inherent chemical properties of the crude oil collected. Nonetheless, the agencies have found it necessary to expand the scope of their testing to measure other factors that would affect the proper characterization and classification of the materials. PHMSA expects to have final test

results in the near future for the gas content, corrosivity, toxicity, flammability and certain other characteristics of the Bakken crude oil, which should more clearly inform the proper characterization of the material.

"Operation Classification" will be an ongoing effort, and PHMSA will continue to collect samples and measure the characteristics of Bakken crude as well as oil from other locations. Based on initial field observations, PHMSA expanded the scope of lab testing to include other factors that affect proper characterization and classification such as Reid Vapor Pressure, corrosivity, hydrogen sulfide content and composition/concentration of the entrained gases in the material. The results of this expanded testing will further inform shippers and carriers about how to ensure that the materials are known and are properly described, classified, and characterized when being shipped. In addition, understanding any unique hazards of the materials will enable offerors, carriers, first responders, as well as PHMSA and FRA to identify any appropriate mitigating measures that need to be taken to ensure the continued safe transportation of these materials.

PHMSA will share the results of these additional tests with interested parties as they become available. PHMSA also reminds offerors that the hazardous materials regulations require offerors of hazardous materials to properly classify and describe the hazardous materials being offered for transportation. 49 CFR 173.22. Accordingly, offerors should not delay completing their own tests while PHMSA collects additional information.

For additional information regarding this safety alert, please contact Rick Raksnis, PHMSA Field Services Division, (202) 366-4455 or E-mail: Richard.Raksnis@dot.gov. For general information and assistance regarding the safe transport of hazardous materials, contact PHMSA's Information Center at 1-800-467-4922 or phmsa.hm-infocenter@dot.gov.



California Council for Environmental and Economic Balance

Letter 149

101 Mission Street, Suite 1440, San Francisco, California 94105 415-512-7890 phone, 415-512-7897 fax, www.cceeb.org

April 10, 2017

Ms. Rajinder Sahota Branch Chief, Cap-and-Trade Program California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target ("2030 Scoping Plan")

Dear Ms. Sahota:

On behalf of the members of the California Council for Environmental and Economic Balance ("CCEEB"), we submit the enclosed comments on the draft 2030 Scoping Plan. CCEEB is a non-profit and non-partisan coalition of business, labor, and public leaders that advances balanced policies for a strong economy and a healthy environment. Many of our members are regulated under climate change programs at the Air Resources Board ("ARB"), and CCEEB has been an active stakeholder throughout ARB's implementation of AB 32 and SB 32.

Our key points are:

- Climate change programs are an ineffective way to reduce local emissions of criteria
 pollutants and toxic air contaminants. Program design should instead focus on
 maximizing reductions of greenhouse gases.
- Cap-and-Trade has been a successful program to date, and should continue post-2020 as part of a comprehensive plan to reach the state's 2030 targets. For this reason, CCEEB supports Alternative 3.
- Care must be taken when developing regulations to achieve direct reductions in pollutants in parallel with Cap-and-Trade so that the programs are complementary and do not raise costs unnecessarily and without clear environmental benefit.
- A carbon tax increases environmental uncertainty yet escalates economic costs by a factor of two to three as compared to Cap-and-Trade.

Can't Get There from Here

There's a running assumption that state climate programs can reduce emissions of local pollutants in a meaningful way, and that programs should be designed with this purpose in mind. While the "single smokestack" theory is certainly convenient, CCEEB believes it over-simplifies control strategies and questions it on two important levels.

First, this argument generally assumes a 1:1 reduction ratio, that is, for every unit of GHGs reduced, combustion emissions are reduced by the same level. CCEEB believes this oversimplifies the relationship between criteria pollutants and GHGs.

More importantly, the critical question is not whether bigger sources emit more than smaller sources; it is whether programs can achieve concurrent reductions. There are key differences between controls for criteria and toxic pollutants and strategies to reduce GHGs; it is wrong to assume emissions can be reduced across the board, and there could even be tradeoffs among pollutant types. For example, while emissions from electric generation were 12 percent of total GHGs statewide (2014), the associated criteria pollutants were less than one percent of state total. As a study conducted by UC Irvine for the 2015 Integrated Energy Policy Report explained, "Deep GHG reduction strategies do not necessarily provide proportionally deep air quality benefits," for generators due to progress already achieved through current air quality and energy regulations and to siting of power plants outside of degraded air basins. Another example are process and equipment changes at refineries undertaken to comply with State and federal fuel standards; these changes typically increase GHG emissions at the refinery, but provide much greater emission benefits for the transportation sector as a whole.

Second, the "single smokestack" argument all but ignores emission inventories, current control programs, and the proportional contribution of capped facilities. Simply put, you cannot get there from here. Capped facilities represent only a portion of cumulative emissions in regional air basins (ranging from 1.1 percent to 9.4 percent³), and—even assuming a 1:1 ratio—reductions mandated under climate rules would not meaningfully change ambient concentrations of ozone, particulate matter, and air toxics in communities, as shown by ARB staff analysis below. Conversely, programs directed at criteria and toxic pollutants continue to succeed, with a significant new round of regulations and measures targeting all source categories recently adopted by ARB in the 2017 State Implementation Plan.

Taken together, CCEEB believes there is insufficient reason to scrap or curtail Cap-and-Trade in pursuit of assumed "foregone co-benefits" of criteria and toxic pollutants. ARB must carefully evaluate the tradeoffs between Cap-and-Trade and other options under consideration, and be clear about legislative intent and program goals.

¹ Presentation by Brian Tarroja, Ph.D., Advanced Power and Energy Program, UC Irvine, "Transition to a Low-Carbon Economy: Air Quality Considerations." https://efiling.energy.ca.gov/getdocument.aspx?tn=205462-3.

² It is important to note that any change at a refinery must be reviewed and permitted through the regional air district, and for non-attainment areas, emissions must be offset at a greater than 1:1 ratio.

³ ARB Cap-and-Trade Regulations, Appendix P: Co-Pollutant Emissions Assessment https://www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf

Alternative 3 is the Most Cost Effective and Environmentally Sound Option

ARB, with public input and strong collaboration with stakeholders, has spent the last decade developing a successful Cap-and-Trade Program. In light of SB 32's even more ambitious 2030 targets, CCEEB continues to believe that a well-designed Cap-and-Trade Program remains the best approach among alternatives.

First, Cap-and-Trade has achieved full compliance and is on track to meet program goals through 2020. It has done so by directing the most efficient reductions among "capped" entities, while providing an important funding mechanism for GHG reductions that either cannot be directly regulated or advance development and deployment of new, lower-carbon technologies and systems.

More importantly, Cap-and-Trade has successfully facilitated linkages and partnerships to other jurisdictions, and has served as an important model to other areas. California has formal linkage agreements with the Province of Québec and partnership agreements with Acre, Aguascalientes, Baja California, Beijing, Chiapas, Chongqing, British Columbia, Guangdong, Jalisco, Jiangsu, Shenzhen, Sichuan, Inner Mongolia, Osaka, Zhenjiang, Chile, France, India, Israel, Japan, Malaysia, Mexico, Kingdom of the Netherlands, Peru, Scotland, and South Korea. While the preponderance of GHG reductions occur within the state, these agreements help prompt much needed international action, needed now more than ever as federal climate programs come under attack. To mitigate GHG emissions and avoid catastrophic effects from climate change, it is imperative that California's strong policies be exported to other states, jurisdictions, and national governments. Without such cooperation, California's economic investments will not pay the hoped for environmental dividends.

Public debate over the 2030 Scoping Plan, fueled in part by recent critiques of Cap-and-Trade, is a concern, as it has undermined confidence in the burgeoning carbon market. While the Governor has sent clear signals of support for continuing Cap-and-Trade, ambiguous discussion at the ARB regarding interpretations of AB 197 and legislative press statements has at times been destabilizing. We believe this has contributed to lackluster auction results in recent cycles—although other factors, such as slower than expected economic growth, play a role and the influence of complementary policies⁴. Care should be taken interpreting what lessons are to be learned. The true test is whether GHG targets are achieved, not how much money is spent. With that said, CCEEB believes that a stronger signal to all stakeholders from ARB and legislative reauthorization supporting Cap-and-Trade extension in parity with the 2030 goal could help ameliorate investment uncertainty.

Facility-level Mandates Shift Emissions, Diminish Effectiveness of Cap-and-Trade

Direct facility regulations, as proposed in the refinery measure and also in broader industry sector specific rules (found in Alternative 1), set a precedent that undermines the very principles of Cap-and-Trade. As reasoned in the 2010 staff report, "By establishing a limit for the program overall rather than for individual sources, the Cap-and-Trade Program gives sources the flexibility to make the most cost-effective choices about when and how to reduce emissions." 5

⁴ http://www.lao.ca.gov/reports/2017/3553/cap-and-trade-021317.pdf

⁵ https://www.arb.ca.gov/regact/2010/capandtrade10/capisor.pdf

Regulations that mandate when and where reductions occur remove this flexibility and shift emissions to other sectors and sources. Where efficiencies are not possible due to a lack of control technology, then facilities are left with combustion/production cuts as the only option for compliance. This results in the highest economic impact, with the potential of emission leakage outside of California, which in turn could increase net GHG emissions. ARB notes this production leakage or rationing selectively in its analysis of Alt 4, this is however also true for the refinery sector measure.

Why Cost Effective? Who Benefits?

ARB's Market Advisory Committee noted that Cap-and-Trade "reduces economic impacts on workers, consumers, and taxpayers." This is because the price of carbon gets passed through in costs for goods, services, and energy. Additionally, regulations can cause economic drag, with some level of jobs and investments "leaking" along with emissions outside of California. For regulated entities, there are costs under any program alternative. What is important is that the state as a whole achieves maximum benefits—both environmental and economic—for its climate programs. We believe this is why AB 32 requires that cost effectiveness be considered.

We reiterate the need to be clear about program objectives, while noting that staff has not articulated a compelling rationale for facility mandates in addition to Cap-and-Trade, especially given the potential negative impacts noted above. It is worth testing a few possible policy assumptions, using the refinery energy efficiency measure as an example:

If the Objective is	then the likely Outcome is		
Reduce GHGs in a specific	Facility/sector costs increase, but emissions shift elsewhere		
facility or sector			
Reduce carbon-intensity of fuels	Combustion efficiency at a facility can already be credited in the LCFS; could actually impede projects needed for reformulation of fuels		
Force reductions in criteria and/or toxic pollutants	Shifts authority from air district to ARB;6 conflicting regulatory requirements;7 cannot show "necessity"		

From a local public health perspective, we have already questioned whether the "single smokestack" approach would result in marginal benefits, regardless of costs due to the fact that capped stationary sources represent 1.1 percent to 9.4 percent of localized emissions in each air basin. For GHGs, ARB has no way of knowing how facilities would have behaved under Capand-Trade, and thus no means to show that direct mandates provide incremental GHG reductions rather than simply shifting emissions elsewhere, as economic theory would suggest. 8

149-1

⁶ Health and Safety Code, Section 38594, as directed by AB 32: "Nothing in this division shall limit or expand the existing authority of any district, as defined in Section 39025.

⁷ H.&S.C., Section 38595: "Nothing in this division shall preclude, prohibit, or restrict the construction of any new facility or the expansion of an existing facility subject to regulation under this division, if all applicable requirements are met and the facility is in compliance with regulations adopted pursuant to this division."
8 The problem of additionality—that is, emission reductions merely shift rather than increase—is true regardless of

The problem of additionality—that is, emission reductions merely shift rather than increase—is true regardless of the regulating authority. So direct GHG mandates required by air districts would have the same problems as those required by ARB since the issue is overlapping requirements on top of Cap-and-Trade.

Carbon Tax Raises Costs with Uncertain Environmental Benefits

Alternatives 2 and 4 both rely on a carbon tax to replace Cap-and-Trade. CCEEB disagrees with either alternative, since a carbon tax places revenue above GHGs in policy priority, which is not consistent with either SB 32 or California's leadership role. And both alternatives increase total economic costs to the state, without providing comparable environmental or public health benefits. There is some question whether a carbon tax could even be passed, as seen recently when voters opposed a carbon tax initiative in Washington State. Conversely, the legislative pathway for extending Cap-and-Trade seems open.

A carbon tax has similar attributes to Cap-and-Trade in that it places a price on carbon, harnesses market forces, and generates revenue. However, as ARB staff point out, a tax does not provide environmental certainty that GHG targets will be met, and choosing a mechanism to set and adjust the "right" price over time is challenging. Conversely, Cap-and-Trade uses the auction and secondary markets to adjust prices in real time, while placing primacy of purpose on the level of GHG reductions needed. Cap-and-Trade also affords businesses some temporal flexibility, in that triennial surrendering of compliance instruments allows entities to respond to price variability in ways that smooth the financial impact of market fluctuations. Businesses also can better adjust for changes in demand for their products and services. In terms of leadership, a carbon tax may serve as a model, but it doesn't allow linkages. That is, other jurisdictions could copy but not join. Indeed, the worldwide trend has been toward markets, rather than taxes, in part because of this power of linkages to prompt action.

At the March 28 workshop, staff presented information estimating the GHG and air quality reductions for each of the 2030 Scoping Plan alternatives, as shown in the table below. The ranges indicate that there are some small tradeoffs among policies, but all are fairly comparable. However, differences in emission benefits must be weighed against program costs, estimates of which were also provided by staff. We find the two options with Cap-and-Trade to have the least total cost, meet GHG targets, and provide comparable environmental and public health cobenefits.

	Staff Proposed Scenario	No Cap-and- Trade (Prescriptive Regulations)	Carbon Tax	All Cap-and- Trade	Cap-and-Tax
Range of GHG Reductions (MMTCO2)	100-184	89-130	100-184	100-184	100-184
Range of NOx Reductions (Tons/Day)	54-68	53-68	54-68	53-67	52-66
Range of VOC Reductions (Tons/Day)	6.4-8.1	6.3-8	6.4-8.1	6.9-8.8	8.3- 11
Range of PM2.5 Reductions (Tons/Day	4.2-5.4	13- <mark>16</mark>	4.2-5.4	4.2-5.4	1.8-2.4

	Staff Proposed Scenario	No Cap-and- Trade (Prescriptive Regulations)	Carbon Tax	All Cap-and- Trade	Cap-and-Tax
Range of Diesel PM Reductions (Tons/Day)	4-9	1-2	4-9	5-10	5-10
Mortality Hospitalizations ER Visits	140-170 21-26 59-73	140-190 21- <mark>28</mark> 59-78	140-170 21-26 59-73	120-150 18-22 51-63	120-160 19-23 53-66
2030 Stock Costs*	\$6.5	\$18.7	\$6.5	\$5.6	\$17.9
2030 Fuel Costs*	-\$5.7	\$1.0	-\$5.7	-\$7.4	-\$4.3
2030 Cost of Reductions due to Carbon Pricing*	\$1.1 to \$3.6	n/a	\$2.6	\$1.6 to \$5.1	\$0
2030 Cost of Reduced Production*	n/a	n/a	n/a	n/a	\$50
2030 Total Cost*	\$1.9 to \$4.4	\$19.7	\$3.4	-\$0.2 to \$3.3	\$63.6

^{*}Billion \$2015

Cap-and-Tax but No Trade

The Cap-and-Tax approach tries to solve the problem of environmental uncertainty from a carbon tax by adding a regulatory overlay that requires facility- or company-specific reductions from major GHG emitters. However, it does so at the cost of efficiency in terms of directing how and where reductions occur. More importantly, compliance costs for businesses, as well as the state economy, rise substantially—Cap-and-Tax could cost more than twenty times a Cap-and-Trade Program. Businesses that could only comply through production or throughput cuts would be hardest hit and at risk of leakage. And, as the recent staff analysis indicates, higher compliance costs do not result in comparable increases in environmental or public health benefits.

Cap-and-Trade Can Work under SB 32 and AB 197

Assembly Member Eduardo Garcia (D-Coachella), the author of AB 197, testified in Assembly Natural Resources Committee on August 24, 2016:

"I also want to just clearly state that we to are supportive of the [Cap-and-Trade] program, the leadership of the Senate who moved the bill out this week is in support of the Cap-and-Trade Program, the leadership of the Assembly is in support of the Cap-and-Trade Program, the governor of the state is in support of the Cap-and-Trade and has asked that 197 be sent to his desk as a package with SB 32. So, I wanted just to state that the intention is by no means to tamper with the Cap-and-Trade Program."

In an August 31, 2016, letter to the Assembly Journal, Assembly Member Garcia reasserted, "It is my intent that nothing in Section 38562.5 shall be interpreted to preclude ARB from adopting any market-based compliance mechanism pursuant AB 32."

Based on these statements, CCEEB urges ARB staff to be measured in its response to AB 197. While AB 197 does list new priorities for ARB to consider in meeting 2030 GHG targets, these can be consistent with and in no way, supersede existing priorities under in AB 32, such as cost effectiveness and technological feasibility. Moreover, we note that at the October 21, 2016, Capand-Trade workshop, staff acknowledged the Cap-and-Trade Program already helps achieve direct emissions reductions.

In terms of SB 32, CCEEB disagrees with the assumption that higher compliance costs will result in increased direct emissions reductions. Rather, CCEEB believes that the 2030 program needs to be designed to *increase* cost effectiveness, both as a means to maximize GHG emissions reductions (i.e., "biggest bang for the buck") and as a way to prevent emissions and economic leakage in the post-2020 program as the declining cap drives up the cost of carbon. Nancy McFadden, executive secretary to the governor, stated on August 4, 2016, "Let this be clear: We are going to extend our climate goals and the Cap-and-Trade Program – one way or another. The governor will continue working with the Legislature to get this done this year, next year, or on the ballot in 2018." CCEEB is actively working with legislative leaders on bills to improve and extend Cap-and-Trade through 2030.

Conclusion

In closing, CCEEB believes there is a great opportunity for California to lead global efforts on climate change through the adoption of a 2030 Scoping Plan that places Cap-and-Trade as the centerpiece of state programs. Unfortunately, we cannot at this time support carbon tax alternatives, nor do we support direct facility mandates underneath a Cap-and-Trade Program.

Thank you for your consideration of our comments. We look forward to discussing our comments with you at your convenience. Please contact me or Jackson R. Gualco, Kendra Daijogo or Mikhael Skvarla, CCEEB's governmental relations representatives at The Gualco Group, Inc. at (916) 441-1392.

Sincerely,

GERALD D. SECUNDY

President

cc: Honorable Chair & Members of the Air Resources Board

Mr. Richard Corey Mr. Jakub Zielkiewicz Ms. Sara Nichols

Gerald O. Securly

Ms. Stephanie Kato

Ms. Emily Wimberger

Mr. Bill Quinn

Ms. Janet Whittick

The Gualco Group, Inc.

Letter 152



CENTER for BIOLOGICAL DIVERSITY

Because life is good.

April 10, 2017

Via internet upload: https://www.arb.ca.gov/lispub/comm/bclist.php

Clerk of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: Proposed 2017 Climate Change Scoping Plan Update and Draft Environmental Analysis

Dear Members of the Air Resources Board:

The Center for Biological Diversity ("Center") respectfully submits the following comments on the Proposed 2017 Climate Change Scoping Plan Update ("Proposed Scoping Plan") and accompanying Draft Environmental Analysis ("Draft EA"). The Center is a non-profit organization with more than one million members and online activists and offices throughout the United States, including in Oakland, Los Angeles, and Joshua Tree, California. The Center's mission is to ensure the preservation, protection and restoration of biodiversity, native species, ecosystems, public lands and waters and public health. In furtherance of these goals, the Center's Climate Law Institute seeks to reduce U.S. greenhouse gas emissions and other air pollution to protect biological diversity, the environment, and human health and welfare. Specific objectives include securing protections for species threatened by global warming, ensuring compliance with applicable law in order to reduce greenhouse gas emissions and other air pollution, and educating and mobilizing the public on global warming and air quality issues.

The Center greatly appreciates the seriousness with which California continues to approach the immense environmental and social challenges posed by climate disruption. On the whole, the Proposed Scoping Plan offers a great deal of insight into many of the measures that will be necessary to ensure that California does its fair share as part of a necessary global effort to confront these challenges. Given the current political context in the United States, California's strong science-based and political leadership on this issue is more essential than ever.

That said, the Center has concerns about certain measures discussed in the Proposed Scoping Plan. As a general matter, the state's legislative emissions reduction goal for 2030—predicated on emissions reductions needed to limit global temperature increases to 2°C—does not reflect current science showing that damage to communities and the environment from even a 2°C temperature rise will likely be considerable. The

Alaska - Arizona - California - Florida - Minnesota - Nevada - New Mexico - New York - Oregon - Vermont - Washington, DC

Kevin Bundy, Climate Legal Director and Senior Attorney - 1212 Broadway, Suite 800 - Oakland, CA 94612

Phone: 510-844-7100 x 313 - Fax: 510-844-7150 - kbundy@biologicaldiversity.org

Proposed Scoping Plan should acknowledge this science and begin the process of moving the state toward a more protective strategy.

The plan also would extend and deepen the state's reliance on the cap-and-trade program to achieve California's 2030 goal, despite mounting evidence that the cap-and-trade program is at best failing to alleviate, and at worst exacerbating, environmental burdens already disproportionately borne by low-income communities and communities of color. The Proposed Scoping Plan also references a number of recommendations and potential compliance strategies under the "Natural and Working Lands" rubric that could have the effect of increasing emissions, and decreasing land-based carbon stocks, significantly between now and 2030, thus directly undermining California's overall emissions reduction goals. Finally, the Draft EA fails to satisfy the requirements of the California Environmental Quality Act ("CEQA") in several important respects.



These comments are offered in a collaborative spirit, with the hope that the Proposed Scoping Plan and Draft EA can be corrected and strengthened before final approval. The Center greatly appreciates the Board's consideration and looks forward to working with the Board and ARB staff as this process moves forward.

I To Avoid the Worst Impacts of Climate Change, Global Average Temperature Increases Must Be Held Well Below 2°C.

As the Proposed Scoping Plan notes, California's 2030 greenhouse gas emissions target is consistent with global emissions reductions necessary to "contain the rise in global temperatures to below 2 degrees Celsius." Severe impacts from the 1°C warming that the planet has already experienced, however, highlight the urgency for stronger climate action to avoid truly catastrophic dangers to people and planet. Although SB 32 imposes a target of reducing emissions 40 percent below 1990 levels by 2030, there is no reason that California could not begin planning now to exceed this target, in accordance with the most current and best available science.

Human-caused climate change is already causing widespread damage from intensifying global food and water insecurity, the increasing frequency of heat waves and other extreme weather events, flooding of coastal regions by sea level rise and increasing storm surge, the rapid loss of Arctic sea ice and Antarctic ice shelves, increasing species extinction risk, and the worldwide collapse of coral reefs. The Third National Climate Assessment makes clear that "reduc[ing] the risks of some of the worst impacts of climate change" will require "aggressive and sustained greenhouse gas emission reductions" over the course of this century.

¹ Proposed Scoping Plan at ES2.

² Melillo, Jerry M., 2014. *Climate Change Impacts in the United States*, in The Third National Climate Assessment (Terese (T.C.) Richmond, and Gary W. Yohe, Eds., U.S. Global Change Research Program 2014).

³ Melillo, Jerry M., at 13, 14, and 649.

Limiting further temperature rise is needed to prevent increasingly dangerous and potentially irreversible impacts. A 2°C temperature increase above pre-industrial levels is past the point where severe and potentially irreversible impacts are predicted to occur, and is no longer considered a safe guardrail for avoiding dangerous climate change.

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming well below 2°C rise above pre-industrial levels. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of carbon that can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66 percent probability of limiting warming to 2°C above preindustrial levels, and to 400 GtCO₂ from 2011 onward for a 66 percent probability of limiting warming to 1.5°C. These carbon budgets have been reduced to 850 GtCO₂ and 240 GtCO₂, respectively, from 2015 onward. Given that global CO₂ emissions in 2015 alone totaled 36 GtCO₂, humanity is rapidly consuming the remaining carbon budget.

One of the most important and urgent actions governments can take at present is to ensure that fossil carbon is kept "in the ground" rather than produced, combusted, and emitted to the atmosphere. According to a large body of scientific research, the vast majority of global and US fossil fuels must stay in the ground in order to hold

⁴ Y. Cai et al., Risk of multiple interacting tipping points should encourage rapid CO₂ emission reduction, 6 Nature Climate Change 520 (2016).

⁵ C-F. Schleussner, et al., Differential climate impacts for policy-relevant limits to global warming: the case of 1.5C and 2C, 7 Earth Systems Dynamics 327 (2016); U.N. Subsidiary Body for Scientific and Technological Advice, Report on the Structured Expert Dialogue on the 2013-2015 review, FCCC/SB/2015/1NF.1 (2015),

http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf.

⁶ The Paris Agreement codifies the international consensus that climate change is an "urgent threat" of global concern, and commits all signatories to a target of holding long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels," reflecting the consensus that 2°C is no longer a safe guardrail. See UNFCCC [United Nations Framework Convention on Climate Change], Conference of the Parties Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), available at http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf

⁷ IPCC 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers at 25; IPCC 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 63-64 and Table 2.2 (Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)). IPCC, Geneva, Switzerland (2014).

⁸ Rogelj, Joeri et al., Differences between carbon budget estimates unraveled, 6 Nature Climate Change 245, (2016), at Table 2.

⁹ See Le Quéré, Corrine, et al., Global Carbon Budget 2016, 8 Earth Syst. Sci. Data 605 (2016), www.globalcarbonproject.org/carbonbudget/16/data.htm.

temperature rise to well below 2°C. 10 Studies estimate that 68 to 80 percent of global fossil fuel reserves must not be extracted and burned to limit temperature rise to 2°C based on a 1,000 GtCO₂ carbon budget.¹¹ For a 50 percent chance of limiting temperature rise to 1.5°C, 85 percent of known fossil fuel reserves must stay in the ground.12 Effectively, fossil fuel emissions must be phased out globally within the next few decades.13

A 2016 analysis found that potential carbon emissions from developed reserves in currently operating oil and gas fields and mines would lead to global temperature rise beyond 2°C. 14 Excluding coal, currently operating oil and gas fields alone would take the world beyond 1.5°C. 15 To stay well below 2°C, the clear implication is that no new fossil fuel extraction or transportation infrastructure should be built, and governments should grant no new permits for new fossil fuel extraction and infrastructure. 6 Moreover, some fields and mines, primarily in rich countries, must be closed before fully exploiting their resources. The analysis concludes that, because "existing fossil fuel reserves considerably exceed both the 2°C and 1.5°C carbon budgets[, i]t follows that exploration for new fossil fuel reserves is at best a waste of money and at worst very dangerous."17

¹⁰ The IPCC estimates that global fossil fuel reserves exceed the remaining carbon budget for staying below 2°C by 4 to 7 times, while fossil fuel resources exceed the carbon budget for 2°C by 31 to 50 times. See Bruckner, Thomas et al. 2014: Energy Systems. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at Table 7.2 (Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) available at http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc wg3 ar5 chapter7.pdf.

To limit temperature rise to 2°C based on a 1,000 GtCO₂ carbon budget from 2011 onward, studies indicate variously that 80 percent (Carbon Tracker Initiative 2013), 76 percent (Raupach et al. 2014), and 68 percent (Oil Change International 2016) of global fossil fuel reserves must stay in the ground. See Carbon Tracker Initiative, Unburnable Carbon - Are the world's financial markets carrying a carbon bubble?, (2013) http://www.carbontracker.org/wpcontent/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf; Raupach, Michael et al., Sharing a quota on cumulative carbon emissions, 4 Nature Climate Change 873 (2014); Oil Change International, The Sky's Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production (September 2016).

¹² Oil Change International 2016, supra note 11 at 6.

¹³ Rogelj et al. (2015) estimated that a reasonable likelihood of limiting warming to 1.5° or 2°C requires global CO2 emissions to be phased out by mid-century and likely as early as 2040-2045. See Rogelj, Joeri et al., Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 Nature Climate Change 519 (2015). Climate Action Tracker indicated that the United States must phase out fossil fuel CO2 emissions even earlier—between 2025 and 2040for a reasonable chance of staying below 2°C. See, e.g. Climate Action Tracker, USA, (updated Jan. 25, 2017), http://climateactiontracker.org/countries/usa.

¹⁴ Oil Change International 2016, supra note 11 at 5.

¹⁵ Id., at 5.

¹⁶ *Id.*, at 5. ¹⁷ *Id.*, at 17.

According to a US-focused analysis, 18 the United States alone has enough recoverable fossil fuels, split about evenly between federal and non-federal resources, that if extracted and burned, would exceed the global carbon budget for a 1.5°C limit, and would consume nearly the entire global budget for a 2°C limit. 19 Specifically, the analysis found:

- Development of federal fossil fuels (leased and unleased) would release up to 492 gigatons (Gt) of carbon dioxide equivalent greenhouse gas pollution ("CO2e"). representing 46 percent to 50 percent of potential emissions from all remaining U.S. fossil fuels.
- Of that amount, up to 450 Gt CO₂e have not yet been leased to private industry for extraction;
- Releasing those 450 Gt CO₂e (the equivalent annual pollution of more than 118,000 coal-fired power plants) would be greater than any proposed U.S. share of global carbon limits that would keep emissions well below 2°C.20

Fracking has also opened up vast resources that otherwise would not be available, increasing the potential for future greenhouse gas emissions.

The urgent need to prevent the worst impacts of climate change means that the world in general - and California in particular - cannot afford to invest in new fossil fuel extraction and infrastructure that locks in carbon intensive oil production for years into the future. The Proposed Scoping Plan, however, is entirely silent on strategies to reduce the development and production of fossil fuel resources in California. Market-based approaches and efficiency measures like those in the Proposed Scoping Plan can go only so far. In order to "prevent the worst-case scenarios of rising temperatures," 21 California must begin planning now for a future in which fossil fuels remain safely in the ground.

Accordingly, the Proposed Scoping Plan should be revised to include an express goal acknowledging the need to shift quickly and permanently away from fossil fuels, and outlining concrete steps necessary for California to begin keeping these resources in the ground.

¹⁸ Ecoshift Consulting, et al., The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels, Prepared for Center for Biological Diversity & Friends of the Earth. (2015). http://www.ecoshiftconsulting.com/wpcontent/uploads/Potential-Greenhouse-Gas-Emissions-U-S-Federal-Fossil-Fuels.pdf.

Id., at. 4.

²⁰ For the United States, Raupach et al. (2014) provided a mid-range estimate of the U.S. carbon quota of 158 GtCO₂ for a 50percent chance of staying below 2°C, using a "blended" scenario of sharing principles for allocating the global carbon budget among countries. This study estimated US fossil fuel reserves at 716 GtCO2, of which coal comprises the vast majority, indicating that most fossil fuel reserves in the US must remain unburned to meet a well below 2°C carbon budget. Raupach et al. 2014, supra note 11 at Supplementary Figure 7.

II. Measures Included in the Proposed Scenario Are Flawed and Unsupported.

The Proposed Scenario's Heavy Reliance on Cap-and-Trade with Offsets Will Likely Exacerbate Environmental Burdens, Particularly in Disadvantaged Communities.

The Proposed Scoping Plan's "Policy Assessment" asserts that "[t]he Cap-and-Trade Program will ensure GHG emission reductions within California that may reduce criteria pollutants and toxic air contaminants."22 However, an analysis by Lara Cushing, et al., submitted in September 2016 to ARB in response to the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, shows that the opposite may be true. 23 Cushing et al. found that, rather than reducing criteria pollutants and toxic air contaminants, California's cap-and-trade program appears to be prolonging, and in some cases exacerbating, environmental burdens borne by low-income communities and people of color in California.

With respect to particulate matter (PM₁₀) co-pollutants from sources covered under California's Cap-and-Trade program, Cushing et al. found that "preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were linked to offset projects located outside of California." These include the cement, in-state electricity generation, oil and gas production, and hydrogen plant sectors.

Furthermore, Cushing et al. found that "facilities that emit the highest levels of both GHGs and PM₁₀ are also more likely to be located in communities with higher proportions of residents of color and residents living in poverty."24 This points to the potential for enhancing public health and environmental equity benefits by achieving more emissions reductions among facilities that are located in disadvantaged communities, rather than deferred and displaced through trading or the purchase of offsets.

As detailed in Cushing et al., offset credits worth more than 12 million tons CO2e were utilized to meet compliance obligations in the first compliance period. 25 These offsets represent 4.4 percent of the total compliance obligation of all regulated companies and over four times the targeted greenhouse gas reduction in 2013 to 2014.²⁶

152-4

²² Proposed Scoping Plan at 47.

²³ Lara J. Cushing, et al., A Preliminary Environmental Equity Assessment of California's Cap and Trade Program. Available at

http://dornsife.usc.edu/assets/sites/242/docs/Climate Equity Brief CA Cap and Trade Sept201 6 FINAL2.pdf.
24 Id., at 10.

²⁵ Id., at 9.

²⁶ Id., at 8.

Seventy-six percent of the offset credits used to date were generated by out-ofstate projects. Thus, rather than achieving reductions at the emissions sources, where
California communities might benefit from reductions in associated co-pollutants, those
reductions were produced via financial transfers from offset projects outside of
California. Furthermore, the 46% of offset credits that came from the destruction of
ozone-depleting substances—primarily industrial refrigerants, previously captured and
stored in containers—produced no co-benefits at the actual project site outside of
California, either.

152-4 cont.

B. Offset Projects Under the Cap-and Trade Program Fail to Ensure Additionality, Are Vulnerable to Leakage, and Threaten Forest Ecosystems.

The offsets component of California's cap-and-trade program is very large. While the cap-and-trade regulation limits the use of offsets to no more than 8% of the "compliance obligation" (i.e., 8% of an emitter's total emissions), this amounts to slightly more than the total reductions expected to directly result from the cap-and-trade program through 2020, ²⁷ and equates to more than half of the total reductions required in California between 2013 and 2020, assuming compliance reserve credits remain unused. ²⁸

To date, offset credits totaling more than 56 million tons have been issued, ²⁹ in the context of an overall GHG reduction program that was initially set to achieve 174 MMT of reductions by 2020, ³⁰ and within a cap-and-trade program that was initially projected to provide a total of 34.4 MMT of reductions. ³¹ In other words, the cap-and-trade program is largely an offsets program.

Ozone Depleting Substances (ODS) made up a large portion of the offsets registered in the first compliance period, as this protocol focused on the destruction or conversion of refrigerants and other industrial chemicals that were banned from production and use under the Montreal Protocol and thus were largely being stored in the hopes of an eventual carbon market to provide an opportunity to profit from their destruction. The California offset market was that opportunity, so there was an early rush to generate these credits as the stockpile was liquidated.

²⁷ Haya, B. 2013. California's carbon offsets program - the offsets limit explained. Available at http://bhaya.berkeley.edu/docs/QuantityofAB32offsetscredits.xlsx, accessed on April 10, 2017. <a href="http://bhaya.berkeley.edu/docs/Qua

²⁹ From the ARB Compliance Offset Program web page, accessed on April 7, 2017. https://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm

³⁰ Initial AB 32 Climate Change Scoping Plan at 21 (Dec. 2008), available at https://www.arb.ca.gov/cc/scopingplan/document/adopted-scoping-plan.pdf. ³¹ Id., at 17.

After the initial mass of ODS credits, forestry offsets made up the largest source of offset credits, providing more than 35 million tons of credits to date, accounting for nearly two-thirds of California's registered offset credits.³²

Although registered forestry projects must meet certain criteria and compliance must be verified by a third-party certification entity, the "forest protocol"—the methodology for qualifying and quantifying offset credits from forest carbon projects—contains fundamental shortcomings that undermine the ability of the program to ensure that offsets are additional, specifically with regard to baseline modeling and leakage, and does not ensure increased carbon sequestration on a landscape or state-wide level. Other components of the protocol, regarding natural forest management and even-age management, raise concerns of unintended impacts to the forest ecosystem and fail to maximize environmental co-benefits as required under AB 32.

The forest protocol does not require the project baseline to include forest growth that is projected to occur under legally mandated long-term management plans such as a "sustained yield plan" or "Option A" document that calculates the long-term sustained yield of timber for the ownership over a 100-year period. These representations are legally required in California in order to gain approval of individual logging plans and are strong indicators of "business as usual" activities. Nor does the project baseline include the requirements and restrictions of Habitat Conservation Plans and Safe Harbor Agreements, which usually require the conservation or development of habitat over the long term in exchange for permission to destroy habitat or harm endangered species in the near term. Furthermore, the forest protocol does not require the project baseline of "reforestation" projects to account for requirements under California's Forest Practice Act and Rules that logged areas be adequately "stocked" after logging, either with trees left on site or, in the case of even-age management, to be replanted within 3-5 years following timber operations.³³ By not requiring the project baseline to include these requirements, the forest protocol allows projects to claim credit for forest growth or conservation that is required or projected to occur anyway.

Instead, the project baseline is set in large part by comparison to the immediately surrounding forest lands, known as the assessment area. For large landowners and timber operators, the assessment area may be largely or entirely within the control of the owner of the forest carbon project. This means that a forest project can produce more credits (forest stocking levels above baseline) if the same landowner has suppressed forest stocking levels in the surrounding area through logging. Furthermore, as there are no guidelines on the shape or location of forest project areas, the forest projects may be designed and located to fit on top of forest areas that may be less commercially attractive or accessible, within and around ongoing logging operations by the same landowner.

152-5

³² From the ARB Compliance Offset Program web page, accessed on April 7, 2017. https://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm

³³ See Pub. Res. Code § 4561; 14 Cal. Code Regs., § 912.7 [932.7, 952.7].

The forest protocol does not estimate leakage risk for each project. Instead, it applies a standardized leakage risk factor, intended to incorporate all sector leakage risk, applied uniformly to all forest projects. This means that all projects are assumed to carry the same leakage risk, and are all thus discounted to the same degree. At the same time, the forest protocol does not require reporting of carbon stocks for the entire land ownership on which the project occurs. With entity-wide reporting, increased stocking levels at an individual project could be compared to the overall forest stocking levels for that landowner, and carbon credits for reduced logging within a project area could be penalized for increased logging elsewhere under the same landowner. Without entity-wide reporting, and without disclosure of the leakage risk specific to a project, project developers can game the program by developing some areas as offset projects, while shifting harvesting to other areas of their land holdings, maintaining or even increasing overall greenhouse gas emissions throughout their operations. Large timber operations would have the most flexibility to shift harvests within large land holdings.

By allowing for the use of even-aged management—specifically including clearcutting—the forest protocol runs contrary to the requirement under AB 32 for the cap and trade program to "maximize additional environmental and economic benefits for California, as appropriate." Forest clearcutting is the management option with the highest risk of exacerbating the impacts of climate change while simultaneously threatening forest ecosystems, water quality, and wildlife. Including even-age management not only makes such operations more profitable, but also perversely undermines the incentive for landowners to consider alternative management scenarios that are less damaging to the forest ecosystem and the climate.

C. An International Forest Offsets Program Would Further Exacerbate the Dislocation of Co-Benefits from California and Bring Additional Problems Related to Non-Additionality and Leakage.

While the Proposed Scoping Plan neither proposes a specific timeline or process for adopting an international forest offset program, nor quantifies the reductions expected to be achieved or displaced through such a mechanism, it does clearly state ARB's intention to pursue an international forest offsets program: "ARB staff identified the jurisdictional program in Acre, Brazil, as a program that is ready to be considered for linkage with California, and has committed to proposing regulatory standards for assessing tropical forestry programs and to proposing a linkage with the program in Acre as part of a future rulemaking process."³⁴

It is a gross overstatement to say that the Acre program is ready to be considered for linkage with California—or, more precisely, that California is ready to consider such a linkage—as multiple stakeholders have raised fundamental and specific concerns with the program and the linkage, particularly with respect to social impacts, leakage, and non-additionality. These are fundamental problems that have yet to be adequately addressed

152-5 cont.

152-6

³⁴ Proposed Scoping Plan at 29, footnote 40.

and would need to be fully addressed before ARB could propose linkage with Acre or any other international jurisdiction.

> An international forest offsets program that requires inventory and reporting at the jurisdictional level reduces the risk of leakage within the jurisdiction but remains highly vulnerable to interstate leakage within the same country, or international leakage to other tropical forest regions.

ARB's proposals have considered multiple options for addressing the problem of interstate leakage—in this context, the increase of deforestation activities in areas outside the partner jurisdiction in response to reductions within the partner jurisdiction. One option is to reduce leakage risk in part by increasing production of goods that drive deforestation, such as wood—and, presumably, cattle and palm oil—within the partner jurisdiction, to reduce the market forces that lead to leakage. This presumably involves land-use decisions and intensified industrialization of cleared lands that could have substantial negative social and environmental implications for local communities and the surrounding forest. In many jurisdictions it would surely not be sufficient to simply require that local environmental laws not be violated, as states where substantial deforestation is occurring generally do not have either high environmental standards or strong enforcement mechanisms. In addition, it would be extremely difficult to monitor such non-forest activities outside of forest project boundaries, across the partner state's economy.

Another option involves measuring interstate and international leakage and accounting for that leakage within the jurisdiction's program, and reducing credits by the estimated amount of leakage. ARB's U.S. domestic forest protocol includes a leakage measure along these lines, applying a uniform, market-wide leakage risk factor to all forest credits. This approach does not take into account the specific leakage risk for any particular project and therefore does not discourage leakage, as all projects are subject to the same standard risk factor, whether or not leakage is occurring. Using this approach in a REDD program would invite gaming through interstate leakage, with timber operators and capital investments moving deforestation activities across state lines. Furthermore, developing a market-wide leakage risk would require global monitoring of forest activities and of the sourcing of products responsible for recent deforestation trends, a potentially valuable but highly ambitious undertaking.

 An International Forest Offsets program carries a high risk of crediting non-additional activities if the process for determining jurisdictional baselines does not account for yearto-year fluctuation and regional trends.

While the risk of non-additional credits depends in large part on how low the business-as-usual baseline is set, it is also necessary to look at each jurisdiction individually to take into account year-to-year fluctuation and recent trends. A recent single year with an exceptionally high rate of deforestation, or the categorization of

152-6 cont.

recently converted palm plantations as forests, for instance, could dramatically lower the baseline, allowing partner states to produce forest offsets of no real carbon benefit.

In comments submitted to ARB in June 2016 on the proposed REDD program and linkage with Acre, Dr. Barbara Haya of the Berkeley Energy & Climate Institute presented the results of an analysis of ARB's proposal to set the crediting baseline at 10% below the average rate of deforestation within a state during the previous ten years. 35 Haya compared the ten-year average deforestation rate (2001-2010) to the following period (2011-2015). Of the 102 jurisdictions that Haya assessed, thirteen showed a drop in deforestation rates by greater than 10%, meaning that an international forest offsets program hypothetically initiated in 2011 with a crediting baseline equal to 10% below the average rates during the previous 10 years would have generated credits without any further action (non-additional crediting). In Acre, average deforestation rates during the 2011-2015 period were 15% lower than the 2001-2010 average, meaning, again, that linkage with Acre over this period would have generated offsets that had no real carbon benefit. 36 In this case, a crediting baseline at 10% below the 10-year historical average is not sufficient to avoid non-additional crediting.

In fact, there are many factors that affect deforestation rates, factors which are largely beyond the scope of an international forest offsets program as ARB has so far considered it. As Haya describes in her comments:

For example, in Brazil, reductions have been affected by the soy and beef moratoriums catalyzed by international NGOs, national Brazil policy, state-level policy and programs, and changes in global commodity prices... It is difficult to assess the extent to which deforestation rates were affected by any one of these factors. Second, the Brazilian government and Acre have decided to make forest protection a priority for a range of reasons, not just for the global climate benefits. Brazil has also committed to reducing its deforestation rate as a part of its commitments under the UN Paris climate accords (in their INDC). They are also receiving funds from governments internationally to help pay for these efforts, including from Norway as mentioned above. An effective REDD program is hard to carry out and requires substantial political will to be successful. The sale of REDD credits can help pay for, and provide legitimacy for, a government to carry out a program they wish to carry out. But if those payments are the main motivation for a REDD program, that REDD program is bound to fail; the political will would not likely be sufficient for an effective REDD program that preserves forests for the long run rather than just

152-6 cont.

36 Id., at 2.

³⁵ Barbara Haya, Research Fellow, Berkeley Energy & Climate Institute, University of California, Berkeley. Comments on California's proposed REDD program and linkage with Acre, Brazil, submitted June 4, 2016. Available at https://www.arb.ca.gov/lists/com-attach/34-sectorbased4-ws-UDgGYVwkWGoLUgBj.pdf, accessed April 10, 2017.

lowering emissions for a short period of time. For all of these reasons, REDD credits would not be considered additional as offset credits."³⁷

152-6

D. The Proposed Scenario Arbitrarily and Unscientifically Assumes Zero Emissions from Biomass Combustion.

In calculating emissions reductions through 2030 based on the Renewable Portfolio Standard, ³⁸ the Proposed Scoping Plan effectively treats emissions from biomass (including bioenergy and biofuels production) as if they do not exist. The PATHWAYS model used to estimate emissions under the Proposed Scoping Plan similarly treats biofuel combustion as zero-emitting. ³⁹ As the Center has pointed out in numerous letters to CARB and other agencies over the past several years, this approach is scientifically unsupported and legally indefensible. ⁴⁰

Wood contains a great deal of carbon. Combustion of wood for energy instantaneously releases virtually all of that carbon to the atmosphere as CO₂. Burning wood for energy is typically less efficient, and thus far more carbon-intensive per unit of energy produced, than burning fossil fuels.

Measured at the stack, biomass combustion produces significantly more CO₂ per megawatt-hour than fossil fuel combustion; a biomass-fueled boiler may have an emissions rate far in excess of 3,000 lbs. CO₂/MWh.⁴¹ Smaller-scale facilities using gasification technology—like the facilities currently being proposed under the SB 1122

152-7

³⁷ Id., at 4 (emphasis in original).

³⁸ Proposed Scoping Plan at 34.

³⁹ Proposed Scoping Plan, App. D at 20.

⁴⁰ See Center for Biological Diversity et al., Comments on California Forest Carbon Plan (March 17, 2017) (submitted to CalFIRE/Forest Carbon Action Team), available at http://www.biologicaldiversity.org/campaigns/debunking the biomass myth/pdfs/Forest Carbon Plan Comments.pdf; Center for Biological Diversity, Comments on Docket No. 16-OIR-05: Pre-Rulemaking Updates to the Power Source Disclosure Regulations (March 15, 2017) (submitted to California Energy Commission), available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=16-OIR-05 [TN# 216573, 216651]; Center for Biological Diversity, Comments on the Proposed Short-Lived Climate Pollutant Strategy (May 26, 2016), available at https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=slcp2016 [comment nos. 94, 96, 97]; Center for Biological Diversity, Comments on Second Set of Proposed Modifications to the AB 32 Greenhouse Gas Cap-and-Trade Regulation (Sept. 27, 2011), available at https://www.arb.ca.gov/lists/capandtrade10/1661-cbd comments re ct 2nd 15day 09 27 11 with exhibits .pdf; Center for Biological Diversity, Comments on the Proposed Greenhouse Gas Cap-and-Trade Regulation (December 15, 2010, available at https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=capandtrade10 [comment nos. 718, 746].) These prior comments and supporting exhibits are incorporated by reference. ⁴¹ Partnership for Policy Integrity, CO₂ Emission Rates from Modern Power Plants (2016) (estimating 3,028 lbs. CO2/MWh emissions rate for new biomass steam turbine based on Department of Energy, Energy Information Administration, International Energy Agency, and Oak Ridge National Laboratory data).

feed-in tariff for small-scale bioenergy (see Public Utilities Code section 399.20(f))—are similarly carbon-intensive. For example, the Cabin Creek bioenergy project approved by Placer County would have an emissions rate of more than 3,300 lbs. CO₂/MWh. As one recent scientific article noted, "[t]he fact that combustion of biomass generally generates more CO₂ emissions to produce a unit of energy than the combustion of fossil fuels increases the difficulty of achieving the goal of reducing GHG emissions by using woody biomass in the short term."

By way of comparison, California's 2012 baseline emissions rate from the electric power sector—which includes only large, fossil-fired electric generating units subject to federal greenhouse gas performance standards—was 954 lbs. CO₂ per MWh. 44 California's actual grid emissions intensity is likely far lower, given the increasing dominance of renewables and storage. Accordingly, replacing California grid electricity with biomass electricity likely at least *triples* smokestack emissions rates—and replacing truly low-carbon renewables with biomass is far worse.

152-7 cont.

Biomass and fossil CO₂ are indistinguishable in terms of their effects on the climate. As Claims about the purported climate benefits of biomass energy turn entirely on purported "net" carbon cycle effects, particularly the possibility that new growth will resequester carbon emitted from combustion, and/or the possibility that biomass combustion might "avoid" emissions that would otherwise occur as biological materials decompose. But even if these net carbon cycle effects are taken into account, emissions from biomass power plants tend to increase atmospheric CO₂ concentrations for decades to centuries depending on feedstocks, biomass harvest practices, and other factors. Multiple studies have shown that it can take a very long time to discharge the "carbon debt" associated with bioenergy production, even where fossil fuel displacement is assumed, and even where "waste" materials like timber harvest residuals are used for fuel. One study, using realistic assumptions about initially increased and subsequently

⁴² Ascent Environmental, Cabin Creek Biomass Facility Project Draft Environmental Impact Report, App. D (July 27, 2012) (describing 2 MW gasification plant with estimated combustion emissions of 26,526 tonnes CO₂e/yr and generating 17,520 MWh/yr of electricity, resulting in an emissions rate of 3,338 lbs. CO₂e/MWh).

⁴³ David Neil Bird, et al., Zero, one, or in between: evaluation of alternative national and entity-level accounting for bioenergy, 4 Global Change Biology Bioenergy 576, 584 (2012), doi:10.1111/j.1757-1707.2011.01137.x.

⁴⁴ See Energy and Environment Daily, Clean Power Plan Hub, at http://www.eenews.net/interactive/clean power plan/states/california (visited May 18, 2016). ⁴⁵ U.S. EPA Science Advisory Board, Science Advisory Board Review of EPA's Accounting Framework for Biogenic CO₂ Emissions from Stationary Sources 7 (Sept. 28, 2012) (hereafter "SAB Panel Report"); see also Center for Biological Diversity, et al. v. EPA, 722 F.3d 401, 406 (D.C. Cir. 2013) ("In layman's terms, the atmosphere makes no distinction between carbon dioxide emitted by biogenic and fossil-fuel sources").

⁴⁶ See, e.g., Stephen R. Mitchell, et al., Carbon Debt and Carbon Sequestration Parity in Forest Bioenergy Production, Global Change Biology Bioenergy (2012) ("Mitchell 2012"), doi: 10.1111/j.1757-1707.2012.01173.x; Ernst-Detlef Schulze, et al., Large-scale Bioenergy from Additional Harvest of Forest Biomass is Neither Sustainable nor Greenhouse Gas Neutral,

repeated bioenergy harvests of woody biomass, concluded that the resulting atmospheric emissions increase may even be permanent.⁴⁷

Harvesting and processing of wood products also result in substantial CO₂ emissions. As Several studies have demonstrated that thinning forests and burning the resulting materials for bioenergy can result in a loss of forest carbon stocks and a transfer of carbon to the atmosphere lasting many years. Because it is impossible to know in advance that wildfire will occur in a thinned stand, thinning operations may remove carbon that never would have been released in a wildfire; one recent study concluded, for this and other reasons, that thinning operations tend to remove about three times as much carbon from the forest as would be avoided in wildfire emissions. Another report from Oregon found that thinning operations resulted in a net loss of forest carbon stocks for up to 50 years. Another published study found that even light-touch thinning operations in several Oregon and California forest ecosystems incurred carbon debts lasting longer than 20 years. Other recent studies have shown that intensive harvest of logging residues that otherwise would be left to decompose on site can deplete soil nutrients and retard forest regrowth as well as reduce soil carbon sequestration.

It has been argued that if logging residues otherwise would be burned in the open, using those same materials for bioenergy might result in a very short carbon payback

Global Change Biology Bioenergy (2012), doi: 10.1111/j.1757-1707.2012.01169.x at 1-2; Jon McKechnie, et al., Forest Bioenergy or Forest Carbon? Assessing Trade-Offs in Greenhouse Gas Mitigation with Wood-Based Fuels, 45 Environ. Sci. Technol. 789 (2011); Anna Repo, et al., Indirect Carbon Dioxide Emissions from Producing Bioenergy from Forest Harvest Residues, Global Change Biology Bioenergy (2010) ("Repo 2010"), doi: 10.1111/j.1757-1707.2010.01065.x; John Gunn, et al., Manomet Center for Conservation Sciences, Massachusetts Biomass Sustainability and Carbon Policy Study (2010), available at https://www.manomet.org/sites/manomet.org/files/Manomet_Biomass_Report_Full_LoRez.pdf (visited May 24, 2016).

152-7 cont.

⁴⁷ Bjart Holtsmark, The Outcome Is in the Assumptions: Analyzing the Effects on Atmospheric CO₂ Levels of Increased Use of Bioenergy From Forest Biomass, Global Change Biology Bioenergy (2012), doi: 10.1111/gcbb.12015.

⁴⁸ Mark E. Harmon, et al., *Modeling Carbon Stores in Oregon and Washington Forest Products:* 1900-1992, 33 Climatic Change 521, 546 (1996) (concluding that 40-60% of carbon in harvested wood is "lost to the atmosphere . . . within a few years of harvest" during wood products manufacturing process).

John L. Campbell, et al., Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Front. Ecol. Env't (2011), doi:10.1890/110057.
 Joshua Clark, et al., Impacts of Thinning on Carbon Stores in the PNW: A Plot Level Analysis, Final Report (Ore. State Univ. College of Forestry May 25, 2011).

⁵¹ Tara Hudiburg, et al., Regional carbon dioxide implications of forest bioenergy production, 1 Nature Climate Change 419 (2011), doi:10.1038/NCLIMATE1264.

⁵² David L. Achat, et al., Forest soil carbon is threatened by intensive biomass harvesting, Scientific Reports 5:15991 (2015), doi:10.1038/srep15991; D.L. Achat, et al., Quantifying consequences of removing harvesting residues on forest soils and tree growth – A meta-analysis, 348 Forest Ecology & Mgmt. 124 (2015).

period. However, unlike combustion in a bioenergy facility, broadcast and pile burning of logging slash does not tend to consume all of the material; a significant portion may remain uncombusted on site. According to Forest Service research, fuel consumption in slash piles can range as low as 75%. Combustion factors for broadcast understory burning of coarse woody debris can be as low as 60%. Moreover, open burning of slash is not a universal practice, nor is it universally permissible; rather, it depends on local conditions, including weather and relevant air quality regulations. 55

As EPA's Science Advisory Board panel on biogenic CO₂ emissions concluded, biomass cannot be considered *a priori* "carbon neutral." Rather, biomass emissions must be compared with emissions that would otherwise occur if specific feedstocks were not used for bioenergy. Such a comparison requires careful attention not only to the quantity of emissions, but also to the particular alternative fates of feedstock materials and the timeframe on which emissions occur; bioenergy emissions occur almost instantaneously, while future resequestration or avoided decomposition may take years, decades, or even centuries to achieve atmospheric parity. This long period of increased atmospheric CO₂ concentrations resulting from bioenergy—combined with profound uncertainty as to the relative permanence of any land-based carbon stock recovery or sequestration could seriously impede achievement of California's mid- and long-term climate goals.

Emissions from forests (part of the "Natural and Working Lands" sector) are "not currently quantified and therefore, not included in the inventory." As a result, the Proposed Scoping Plan apparently does not count emissions from biomass combustion in

152-7 cont.

⁵³ Colin C. Hardy, Guidelines for Estimating Volume, Biomass, and Smoke Production for Piled Slash, U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-364 (1996).

⁵⁴ See Eric E. Knapp et al., Fuel Reduction and Coarse Woody Debris Dynamics with Early Season and Late Season Prescribed Fire in a Sierra Nevada Mixed Conifer Forest, 208 Forest Ecology & Mgmt. 383 (2005).

⁵⁵ See, e.g., North Coast Unified Air Quality Management District (California), Regulation II, available at http://www.ncuaqmd.org/index.php?page=rules.regulations; Placer County (California) Air Pollution Control District, Regulation 3, available at http://www.placer.ca.gov/departments/air/rules.

⁵⁶ SAB Panel Report, supra note 45 at 18.

See SAB Panel Report, supra note 45 at 18; see also Michael T. Ter-Mikaelian, et al., The Burning Question: Does Forest Bioenergy Reduce Carbon Emissions? A Review of Common Misconceptions about Forest Carbon Accounting, 113 J. Forestry 57 (2015); Timothy D. Searchinger, et al., Fixing a Critical Climate Accounting Error, 326 Science 527 (2009); see also Mitchell 2012, supra note 46 at 9 (concluding that management of forests for maximum carbon sequestration provides straightforward and predictable benefits, while managing forests for bioenergy production requires careful consideration to avoid a net release of carbon to the atmosphere)

⁵⁸ See Brendan Mackey et al., Untangling the confusion around land carbon science and climate change mitigation policy, 3 Nature Climate Change 552 (2013), doi:10.1038/NCLIMATE1804.
⁵⁹ Proposed Scoping Plan at 16.

any emissions category (i.e., in the land use sector or the energy sector); those emissions simply disappear from the ledger, rendering any decision as to the ability of the Proposed Scoping Plan to achieve legislatively mandated targets inherently unsupported and arbitrary. Moreover, as the Center has pointed out in prior comments, the draft modeling for the Natural and Working Lands inventory is preliminary, generalized, incomplete, and unsuitable as support for any particular management policy. ⁶⁰ Those prior comments are also incorporated by reference.

Furthermore, as the Center also has pointed out in prior comments, treating all biomass emissions as if they do not exist is likely inconsistent with the federal Clean Power Plan. ⁶¹ Those prior comments are incorporated by reference. The Center understands that there is currently some uncertainty surrounding the Clean Power Plan, but it would make little sense to adopt an approach in the Proposed Scoping Plan that risks inconsistency with federal regulations.

Finally, the Center notes and strongly agrees with the recommendations of the Environmental Justice Advisory Committee opposing biomass combustion and biofuels production. ⁶² Burdens associated with siting and operation of biomass facilities often tend to fall on disadvantaged communities, particularly in the Central Valley, that are far from many sources of biomass feedstocks and that receive few if any of the purported "benefits" of using forest materials for energy. Uncritical promotion of bioenergy generation and biofuels production from forest feedstocks is inconsistent and incompatible with legislative direction regarding environmental justice and maximization of co-benefits in disadvantaged communities.

III. AB 197 Analysis: Social Cost of Carbon

The Proposed Scoping Plan relies on U.S. EPA's "SC-CO₂" estimates in calculating the "social cost of carbon" ("SCC"), which reflects the potential economic damages avoided by (and the potential economic benefits of) action to reduce climate pollution.⁶³ The Proposed Scoping Plan properly acknowledges that "[t]here continues to be active discussion within government and academia about the role of SC-CO₂ in assessing regulations,"⁶⁴ and correctly proposes that the state continue to monitor these discussions as well as "initiate its own work to refine a SC-CO₂ method and values for

152-7 cont.

⁶⁰ Center for Biological Diversity, Comments on Public Workshop on Carbon Sequestration Modeling Methods and Initial Results for the Natural & Working Lands Sector in the 2030 Target Scoping Plan (Jan. 13, 2017), available at

https://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=sp2030nwlmodeling-ws [comment 8].

⁶¹ Center for Biological Diversity, Comments on Proposed Compliance Plan for the Federal Clean Power Plan (Sept. 19, 2016), available at https://www.arb.ca.gov/lists/com-attach/7-cpp2016-AjNVZQRaUzBQbwJd.pdf.

⁶² Proposed Scoping Plan, App. A at 6, 9, 10, 19, 20, 22.

⁶³ See Proposed Scoping Plan at 60-61.

⁶⁴ Id. at 60.

California. ³⁶⁵ This effort is now more critical than ever, as the Trump Administration has moved to disband the Interagency Working Group on the Social Cost of Carbon and to withdraw technical documentation supporting EPA's SCC calculations. ⁶⁶

In moving forward with an SCC calculation for California, the state should rely on the best scientific information. Recent scientific literature demonstrates that the assumptions underlying the Interagency Working Group's work are highly questionable and significantly understate the SCC value. For example, noted experts Ackerman and Stanton critiqued the Interagency Working Group's methods and conclusions, including its use of only three flawed assessment models, FUND, PAGE, and DICE, to estimate the SCC. 67 Researchers at Stanford University published a study showing that the integrated assessment models that were used to generate federal SCC estimates do not properly account for several critical variables, particularly the effect of climate change on economic growth rates and the resulting disparities between rich and poor regions. 68 Other studies suggest improvements to the SCC modeling framework that would better account for relevant factors such as the degree of risk aversion that decision makers tend to exhibit when making policy⁶⁹ and the changing rate and intensity of economic damage above critical temperature thresholds.⁷⁰ Incorporating these improvements to the SCC would significantly increase the federal estimates, in some cases by multiple orders of magnitude.

In addition, the EPA's SCC calculations suffer from a defect so fundamental as to render the analysis fatally defective: the SCC estimates are calculated only through 2050. This defect is all the more significant because the damage caused by CO₂ emissions lasts for centuries, if not millennia, and will dramatically *increase* after 2050. In other words, the most significant social costs of carbon are simply left out. An estimate that fails to account for years after 2050, during which the planet will experience much higher temperatures and therefore the most devastating damages caused by global warming, cannot reasonably inform decision-makers about the social cost of carbon. California can and should take these scientific critiques into account in developing its own approach to calculating the social cost of carbon.

⁶⁶ Executive Order 13,783, Promoting Energy Independence and Economic Growth, § 5, 82 Fed. Reg. 16,093 (March 31, 2017).

⁶⁵ Id. at 61.

⁶⁷ Ackerman, F., and E. Stanton, The Social Cost of Carbon, A Report for the Economics for Equity and the Environment Network (2010), available at www.e3network.org/papers/SocialCostOfCarbon_SEI_20100401.pdf.

⁶⁸ F. Moore and D. Diaz, Temperature impacts on economic growth warrant stringent mitigation policy, 5 Nature Climate Change 127 (2015).

⁶⁹ R.B. Howarth et al., *Risk mitigation and the social cost of carbon*, 24 Global Environmental Change 123 (2014).

Martin L. Weitzman, GHG Targets as Insurance Against Catastrophic Climate Damages, National Bureau of Economic Research Working Paper No. 16136 (2010), available at http://www.nber.org/papers/w16136.

IV. Other Measures

Energy Sector A.

SB 350 envisioned that ARB would set a greenhouse gas target for the electricity sector for use in a new integrated resource planning ("IRP") process for electrical procurement. (See Pub. Util. Code § 454.52(a)(1)(A).) The Public Utilities Commission is currently conducting a proceeding to institute integrated resource planning for loadserving entities. The Early in that proceeding, CPUC staff indicated an expectation that ARB will set greenhouse gas targets pursuant to SB 350 as part of the current Scoping Plan update. 72 The Proposed Scoping Plan, however, does not establish such a target, but rather merely lists establishment of "GHG planning targets for the electricity sector and each load-serving entity" under "Ongoing and Proposed Measures" for the energy sector. 73 A more recent document in the IRP proceeding confirms that "CARB has yet to establish the electricity sector share of the economywide GHG emission reduction target."74

ARB's guidance—or lack thereof—is likely to have a substantial effect on the IRP proceeding, future long-term electrical procurement decisions, and ultimately the ability of the energy sector to assist in meeting 2030 greenhouse gas emissions reduction goals. Absent a target for the electricity sector that can be used in integrated resource planning, electrical procurement will remain disconnected from planning for greenhouse gas reductions, contrary to the plain intent and requirements of SB 350.

ARB's arbitrary and unsupported decision to exempt biomass emissions from compliance obligations under the cap-and-trade program also continues to infect other agencies' planning processes. Parties have urged the PUC to treat biomass generation as zero-emitting for purposes of electricity procurement planning, citing the biomass emissions exemption in the cap-and-trade program. Other agencies will continue to look to ARB to resolve issues concerning bioenergy emissions, and until ARB does so in a scientifically credible manner, all of the state's greenhouse gas goals will remain in doubt.

⁷¹ Public Utilities Commission Docket No. R.16-02-007, available at https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5 PROCEEDING SELECT:R160 2007.

72 See California Public Utilities Commission, Energy Division, CPUC Staff Concept Paper on

Integrated Resource Planning at 6 n.1 (Aug. 11, 2016).

⁷³ Proposed Scoping Plan at 90.

⁷⁴ CPUC and California Energy Commission Staff, Options for Setting GHG Planning Targets for Integrated Resource Planning and Apportioning Targets among Publicly Owned Utilities and Load Serving Entities at 1 (Feb. 10, 2017).

B. Industry

The Proposed Scoping Plan recommends that industrial facilities "[i]ncrease fuel switching to non-fossil fuel" to reduce emissions. ⁷⁵ The plan does not specify what is meant by "non-fossil fuel." To the extent ARB intends to encourage industrial facilities to switch to combustion of biomass or biofuels for industrial processes, the proposal lacks support; ARB must develop an accurate accounting methodology for biomass emissions before reaching any conclusion as to the emissions reduction potential of fuel-switching.

The Proposed Scoping Plan also encourages the use of renewable natural gas. Again, any proposal for increased use of renewable natural gas must be based on an accurate accounting methodology that shows clear emissions reduction benefits. Nowhere does the Proposed Scoping Plan demonstrate that any particular technology or feedstock (forest-sourced biomass feedstocks included) has such benefits.

C. Transportation

Many of the "Transportation Sustainability" measures outlined in the Proposed Scoping Plan—such as moving toward zero-emission vehicles, increasing transit, and creating communities built around active transportation—will likely prove essential to meeting California's climate goals, and their inclusion in the plan is welcome. In particular, the Proposed Scoping Plan properly acknowledges the "VMT gap," i.e., that deeper reductions in vehicle miles traveled are necessary than can be achieved by increased SB 375 targets alone. ⁷⁶ The VMT reduction goals outlined in the plan are largely appropriate, and the Center encourages their adoption. However, additional reliance on biofuels (particularly those derived from forest-sourced feedstocks) at present lacks necessary support in accurate and comprehensive greenhouse gas accounting.

The Proposed Scoping Plan also recommends that California Environmental Quality Act ("CEQA") compliance be streamlined in order to facilitate infill development. The plan identifies no support for the proposition that CEQA streamlining will result in more infill development, let alone tangible VMT reductions. Indeed, a recent study by BAE Urban Economics directly challenged the notion that CEQA creates barriers to development; the BAE study found that CEQA not only coexists with, but also promotes, sustainable development by "daylighting" planning processes and ensuring adoption of feasible measures to reduce environmental impacts. The complaint that CEQA poses a major barrier to development is simply unsupported by any quantitative study. The link between CEQA streamlining and VMT (and

⁷⁵ Proposed Scoping Plan at 96.

⁷⁶ See Proposed Scoping Plan at 101.

⁷⁷ Proposed Scoping Plan at 105.

⁷⁸ BAE Urban Economics, CEQA in the 21st Century: Environmental Quality, Economic Prosperity, and Sustainable Development in California (August 2016).
⁷⁹ Id. at ii.

greenhouse gas) reduction suggested in the Proposed Scoping Plan lacks a sufficient factual basis.

D. Natural and Working Lands

The Natural and Working Lands section of the Proposed Scoping Plan—although not part of the "Proposed Scenario"—contains a number of unsupported assertions and assumptions. These assumptions could lead to policy prescriptions that ultimately increase rather than reduce greenhouse gas emissions and that could make it much harder for California to achieve its 2030 emissions reduction goal.

As a threshold matter, the Proposed Scoping Plan's target for this sector is less than ambitious. The plan recommends only that natural and working lands remain a net sink for carbon. 80 Under current law, however, the forest sector alone must sequester five million metric tons CO₂e per year. 81 Carbon stocks on California's natural lands—particularly forest lands—have already been severely depleted by many decades of logging and development. Merely maintaining those lands in their current, degraded condition does not substantially advance California's climate goals. 82

The Proposed Scoping Plan's strategies for natural and working lands, in contrast, rest on numerous false and unsupported assumptions. For example, the plan states that black carbon emissions from wildfire can and should be minimized, ostensibly through more intensive forest management. ⁸³ As the Center has pointed out in prior comments on the Short-Lived Climate Pollutants Strategy and the Forest Carbon Plan, however, ARB's estimate of black carbon emissions from wildfire is uncertain by at least an order of magnitude, the warming effect of wildfire smoke as a whole is inadequately characterized, and any black carbon reductions that might be achieved through forest management are so uncertain as to be completely speculative. ⁸⁴ Again, those prior comments are incorporated by reference. In any event, ARB's statutory authority to regulate black carbon emissions from wildfire is doubtful at best. The Short-Lived

⁸⁰ Proposed Scoping Plan at ES5, 108-09.

⁸¹ See Pub. Res. Code §§ 4512.5(b), 4551(b).

A recent report released by Dogwood Alliance outlines a strategy for maximizing forest carbon sequestration that focuses on protection of forest lands, not just the type of continued industrial management suggested by a term like "working" lands. See generally Bill Moomaw, Ph.D., and Danna Smith, The Great American Stand: US Forests and the Climate Emergency (2017), available at https://www.dogwoodalliance.org/wp-content/uploads/2017/03/The-Great-American-Stand-Report.pdf.

⁸³ See Proposed Scoping Plan at 14-15, 109, 110.

⁸⁴ Center for Biological Diversity et al., Comments on California Forest Carbon Plan (March 17, 2017) (submitted to CalFIRE/Forest Carbon Action Team), available at http://www.biologicaldiversity.org/campaigns/debunking the biomass myth/pdfs/Forest Carbon Plan Comments.pdf; Center for Biological Diversity, Comments on the Proposed Short-Lived Climate Pollutant Strategy (May 26, 2016), available at https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=slcp2016 [comment nos. 94, 96, 97].

Climate Pollutants Strategy is limited by statute to addressing "anthropogenic" black carbon emissions. (Health & Safety Code § 39730.5(a).) In addition, black carbon is not a "greenhouse gas" as defined in AB 32 (Health & Safety Code § 38505(g)), and thus is not directly relevant to either the "greenhouse gas emissions limit" established by AB 32 or the longer-term "greenhouse gas emissions reductions" required under SB 32. (Id., §§ 38550, 38566). Absent some source of statutory authority, it is not clear ARB can undertake to regulate natural, non-anthropogenic black carbon emissions through the Scoping Plan or otherwise.

Other assertions and assumptions in the Proposed Scoping Plan-particularly concerning the occurrence of wildfire in California forests and the forest management strategies purportedly necessary to reduce wildfire incidence and risk—similarly lack support. 85 The Proposed Scoping Plan-like the Forest Carbon Plan-seems to proceed on the assumption that removing wood from the forest and using it for energy production or transportation fuels will reduce emissions and increase forest carbon stocks. 86 As the Center has pointed out in comments on the Forest Carbon Plan-again incorporated by reference—large-scale forest thinning projects of the type envisioned in both plans are likely to result in considerable carbon losses in California forests, particularly during the time frame relevant to achievement of the state's 2030 emissions reduction goal. 87 The Proposed Scoping Plan appears to acknowledge this problem, at least indirectly, by claiming that these strategies simply trade "some near-term carbon loss" for "more resilient and healthier forests in the longer time frame."88 But the plan identifies no adequate factual support for this vague promise of future resiliency and health; nor does it adequately demonstrate that near-term carbon losses will lead to future carbon sequestration. Even the rough, provisional and flawed modeling conducted for the plan update reveals that forest management alternatives result in deep and lasting carbon losses well beyond 2030. Indeed, the "high management" strategy modeled for the plan would result in a loss of nearly 20 million metric tons of carbon—equivalent to more than 73 million metric tons of CO₂—by 2030. 89 Especially given that CO₂ exerts its greatest warming effect over the short term (although the warming effect also persists over the

⁸⁵ See, e.g., Proposed Scoping Plan at 2, 9, 14-15, 26, 109-110, 115-118.

⁸⁶ Id. at 113-119. Although the Proposed Scoping Plan does not appear to rely on or incorporate the Forest Carbon Plan, it does envision that the Forest Carbon Plan will be completed and implemented as part of California's "tapestry" of climate strategies. See *id.* at ES7, 7, 14 n.28, 118.

⁸⁷ Center for Biological Diversity et al., Comments on California Forest Carbon Plan (March 17, 2017) (submitted to CalFIRE/Forest Carbon Action Team), available at http://www.biologicaldiversity.org/campaigns/debunking the biomass myth/pdfs/Forest Carbon Plan Comments.pdf. A CD containing copies of references cited in the Forest Carbon Plan comments will be submitted under separate cover for inclusion in the record of proceedings for the Proposed Scoping Plan.

⁸⁸ Proposed Scoping Plan at 26.

⁸⁹ Proposed Scoping Plan, App. G at 6.

long term), ⁹⁰ any strategy that entails moving large amounts of carbon from the forest to the atmosphere in the next several decades directly conflicts with California's climate goals.

In sum, the "Potential Actions" and "Efforts to Support Sector Objectives" outlined in the Proposed Scoping Plan contain a number of assertions and proposals that are not supported by adequate modeling or any other analysis. ARB cannot simply continue to assume, rather than demonstrate, that thinning and bioenergy production will increase carbon sequestration, in the face of considerable evidence before the agency showing that these activities may well increase carbon emissions.

E. Waste Management

The Proposed Scoping Plan rightly targets numerous emissions reduction opportunities in the waste management sector. Additional research should include developing methodologies for analysis and identification of the lowest-emission alternatives for dealing with particular waste streams; burning waste, or trying to turn it into fuel that then gets burned, may not be the lowest-emission alternative, and may come with a host of other economic and environmental costs.

V. Achieving Success

The Proposed Scoping Plan correctly emphasizes the importance of action by local jurisdictions. ⁹¹ These comments touch on only two categories of local action: climate action plans ("CAPs") and project-specific CEQA mitigation.

CAPs should not be viewed solely as a method of streamlining development approvals or CEQA compliance. Rather, CAPs should be seen as a tool for building strong, quantitative linkages between statewide targets and concrete measures under the control of local jurisdictions. In other words, an adequate CAP must be grounded in state emissions reduction goals, quantitative, enforceable, and specific before any streamlining is appropriate. Done right, a CAP could provide local jurisdictions with powerful tools for ensuring that individual project decisions will be consistent with statewide climate goals. Done incorrectly, however, CAPs could simply obscure the extent to which individual projects may be increasing emissions notwithstanding state requirements.

CEQA is also an important and powerful tool for ensuring that individual projects, which often cause emissions increases, adopt all feasible project-level mitigation measures and alternatives to reduce emissions to the greatest extent practicable. The

⁹⁰ Katharine L. Ricke and Ken Caldeira, Maximum Warming Occurs About One Decade after a Carbon Dioxide Emission, 9 ENVIRON. RES. LETT. 124002 (2014), doi:10.1088/1748-9326/9/12/124002.

⁹¹ However, the Center notes that some of the suggestions for local action in Appendix B embrace the unsupported assumptions about wildfire, forest management, and bioenergy/biofuels production referenced elsewhere in the Proposed Scoping Plan.

mitigation strategies outlined in Appendix B to the Proposed Scoping Plan are a welcome and useful guide for local jurisdictions. That said, the discussion of offset credits as CEQA mitigation in Appendix B is inadequate and should be clarified. In order to function as effective and enforceable mitigation under CEQA, offset credits must be rigorously additional, verifiable, real, quantitative, and permanent. Offset credits available from many registries (including CAPCOA's GHGRx registry) do not reliably meet these standards, and should not be promoted as adequate for CEQA mitigation purposes.

Moreover, it is doubtful as a scientific matter that land-based carbon offsetseven those generated under ARB-certified protocols—can adequately mitigate for project-level fossil emissions. One recent study concluded that California's compliance protocol for improved forest management projects is unlikely to change land management decisions already in forest landowners' interests, and thus is likely creating non-additional offset credits. 92 Another recent global analysis pointed to fundamental physical limits on the ability of land-based carbon stocks, including forests, to absorb necessary quantities of fossil carbon emissions. 93 Among other conclusions, the study noted that fossil CO2 emissions should be presumed to persist in the atmosphere for 10,000 years, not 100 years—meaning that terrestrial carbon storage projects must demonstrate permanence not just on century timescales, but on multi-millennial timescales. 94 ARB's US Forest Project Protocol, like many other offset protocols, requires carbon reductions to be monitored for only 100 years. 95 Fossil CO₂ emissions from a development project are, as a practical matter, "irreversible." Even if offset credits are assumed to be rigorously additional, they are not permanent on timescales necessary to mitigate the physical impact on climate change.

Finally, it bears mention that AB 900 certification is not dispositive of a project's emissions, the significance of those emissions, or the necessity for mitigation. As one court recently put it, "the Governor's certification [under AB 900] serves a distinct purpose and is not a substitute for a CEQA determination on the significance of greenhouse gas emissions" (Mission Bay Alliance v. Office of Community Investment & Infrastructure (2016) 6 Cal.App 5th 160, 198 fn.26.) Any suggestion to the contrary in the Proposed Scoping Plan⁹⁷ is inconsistent with law.

⁹² See Erin Clover Kelly and Marissa Bongiovanni Schmitz, Forest offsets and the California compliance market: Bringing an abstract ecosystem good to market, 75 Geoforum 99, 106 (2016)

⁹³ Brendan Mackey et al., Untangling the confusion around land carbon science and climate change mitigation policy, 3 Nature Climate Change 552 (2013), doi:10.1038/NCLIMATE1804.
⁹⁴ Id. at 556.

⁹⁵ California Air Resources Board, Compliance Offset Protocol: U.S. Forest Projects at 30 (June 25, 2015), available at https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf ("For purposes of this protocol, 100 years is considered permanent.").
⁹⁶ Mackey 2013, *supra* note 93 at 553.

⁹⁷ See Proposed Scoping Plan at 136.

- VI. The Draft Environmental Assessment Fails to Comply with the California Environmental Quality Act and Cannot Support Approval of the Proposed Scoping Plan as Drafted.
 - A. The Draft Environmental Analysis Fails to Disclose, Evaluate, or Propose Mitigation for Impacts of the Natural and Working Lands Strategy

Public agencies may not approve or carry out any project that may have a significant effect on the environment without first complying with the California Environmental Quality Act ("CEQA"). (Pub. Res. Code §§ 21001, 21002.1, 21081.) A "project" is any discretionary action that may cause a direct or a reasonably foreseeable indirect physical change in the environment. (See Pub. Res. Code § 21065.) As ARB correctly recognizes, the Proposed Scoping Plan is a "project" for purposes of CEQA. 98

The status of the Natural and Working Lands component of the Proposed Scoping Plan relative to the "Proposed Scenario" is somewhat ambiguous. On one hand, the Proposed Scoping Plan claims that it "comprehensively addresses for the first time the greenhouse gas emissions from natural and working lands of California – including the agriculture and forestry sectors." On the other hand, however, the Proposed Scoping Plan acknowledges that because Natural and Working Lands inventories are not yet complete, analyses in Chapter II (the "Proposed Scenario") "do not include any estimates" from the Natural and Working Lands sector. On the Matural and Working Lands discussion in the Proposed Scoping Plan.

As discussed above and in separate comments incorporated by reference, implementation of many of the foreseeable compliance actions associated with the Natural and Working Lands discussion in the Proposed Scoping Plan, as well as actions associated with implementation of the Forest Carbon Plan, may have a number of potentially significant environmental effects. The Draft EA, however, does not disclose, analyze, propose mitigation for, or evaluate alternatives that could feasibly avoid, any of these potentially significant impacts. Indeed, the Draft EA explicitly defines the "project" under review for CEQA purposes as including only "the recommended measures to achieve the 2030 target in Chapter II of the Proposed Plan." 102

152-8

⁹⁸ Proposed Scoping Plan at 82.

⁹⁹ Id. at ES1.

¹⁰⁰ Id. at 31.

¹⁰¹ Id. at 34-36 (Table II-1).

¹⁰² Draft EA at 9; see also *id.* at 12 (describing "known commitments" and "additional measures" comprising "project" analyzed in Draft EA).

In short, none of the potential impacts associated with Natural and Working Lands measures (including but not limited to the Forest Carbon Plan) are addressed in the Draft EA. Accordingly, ARB cannot lawfully approve or carry out any aspect of the Natural and Working Lands portion of the Scoping Plan prior to conducting a revised CEQA analysis that fully discloses, analyzes, and proposes mitigation for its potentially significant environmental effects. Nor can ARB or any other agency rely on the Draft EA in approving or carrying out the Forest Carbon Plan.

152-8 cont.

B. The Draft EA Fails to Address Greenhouse Gas Emissions from Additional Biomass Energy and Biofuels Facilities.

As discussed above and in separate comments incorporated by reference, when measured at the smokestack, biomass energy production is considerably more carbon-intensive than either fossil-fueled or other renewable generation. Determining the "net" atmospheric impact of biomass generation, and the time frame over which such an impact may occur relative to the goals of SB 32, require a degree of analysis that neither the Draft EA nor the Proposed Scoping Plan contain. Any express or implicit conclusion as to the "net" effects of bioenergy production in either the Proposed Scoping Plan or the Draft EA therefore lacks evidentiary support.

Increased bioenergy development is a foreseeable consequence of the Proposed Scoping Plan. For example, a commitment to the 50% RPS pursuant to SB 350 is among the "known commitments" defined as part of the "project" considered in the Draft EA. 103 Feasible compliance responses include development of "[a]dditional renewable energy supplies . . . from new . . . solid-fuel biomass [and] biogas" facilities. 104 LCFS measures are also expected "to increase the use of biomass-based fuels. 105 Attachment A to the Draft EA acknowledges that bioenergy generation, unlike "non-biomass renewable sources of energy (hydropower, geothermal, wind, and solar)," directly emits greenhouse gases. 106

Yet the greenhouse gas chapter of Draft EA completely omits any discussion of greenhouse gas emissions from new bioenergy and biofuels facilities. ¹⁰⁷ Other sections of the EA at least cursorily mention impacts associated with biomass facility development, ¹⁰⁸ but the greenhouse gas section of the document is completely silent. This lack of disclosure and analysis not only fails to inform decision-makers and the public but also precludes consideration of mitigation measures and/or alternatives that could reduce

¹⁵²⁻⁹

¹⁰³ Draft EA at 14.

¹⁰⁴ Id. at 15, 36.

¹⁰⁵ Id. at 16.

¹⁰⁶ Draft EA Attachment A at 19; see also id. at 26 (acknowledging that biomass combustion emits greenhouse gases).

¹⁰⁷ See Draft EA at 93-95, 163.

¹⁰⁸ See, e.g., Draft EA at 46-47 (aesthetics), 53-54 (agriculture and forestry), 59-60 (air quality), 79-81 (biological resources), 114-15 (hydrology and water quality), 122-23 (land use and planning), 153 (water use and utility systems).

or avoid those increases. The Draft EA's complete failure to address these effects renders the document inadequate under CEQA as a matter of law. See, e.g., Sierra Club v. Bd. of Forestry, 7 Cal. 4th at 1236 (complete absence of information made meaningful assessment of potentially significant impacts and development of mitigation measures impossible; "[i]n these circumstances prejudice is presumed"); Bakersfield Citizens for Local Control v. City of Bakersfield, 124 Cal. App. 4th 1184, 1198 (2004).

The Draft EA's failure to disclose or evaluate potentially significant greenhouse gas increases from additional bioenergy production also renders its conclusion that the Proposed Scoping Plan's climate impacts will be beneficial unsupported by substantial evidence. The Draft EA contains only the most cursory discussion of construction-related emissions associated with Proposed Scoping Plan compliance measures, and concludes that these emissions are "not considered substantial" in relation to the overall reductions the plan is intended to achieve. Yet without acknowledging all of the emissions that may be caused by foreseeable compliance responses under the plan, the Draft EA fails to provide an evidentiary basis for any such conclusion. In essence, the Draft EA improperly attempts to balance the Strategy's adverse climate impacts against its claimed climate benefits. "CEQA does not authorize an agency to proceed with a project that will have significant, unmitigated effects on the environment, based simply on a weighing of those effects against the project's benefits, unless the measures necessary to mitigate those effects are truly infeasible." City of Marina v. Bd. of Trs. of Cal. State Univ., 39 Cal. 4th 341, 368-69 (2006).

B. The Alternatives Analysis Is Inadequate.

Both the Proposed Scoping Plan and the Draft EA discuss alternatives to the "Proposed Scenario," particularly its reliance on a cap-and-trade system for a substantial portion of required reductions. Yet the non-cap-and-trade alternatives in both documents are neither formulated nor analyzed adequately. Indeed, the project objectives—particularly those articulated in the Proposed Scoping Plan itself—appear to have been chosen precisely to preclude any alternative that does not include cap-and-trade. Moreover, the Draft EA does not adequately demonstrate that non-cap-and-trade alternatives are infeasible within the meaning of CEOA.

The "policy criteria" used to compare alternatives in the Proposed Scoping Plan differ somewhat from the "project objectives" that frame the alternatives analysis in the Draft EA. ¹⁰⁹ For example, one of the key "policy criteria" listed in the plan involves the creation and preservation of "linkages" with other jurisdictions' climate change programs. ¹¹⁰ According to the Proposed Scoping Plan, one of the key disadvantages of the non-cap-and-trade alternatives—and thus one of the reasons for rejection of these alternatives—is that they present "limited opportunities for linkages" with other programs. ¹¹¹ Yet "linkages" are not mentioned among the project objectives enumerated

152-10

¹⁰⁹ Compare Proposed Scoping Plan at 45-48 with Draft EA at 175-77.

¹¹⁰ See Proposed Scoping Plan at 46, 48.

¹¹¹ Id. at 50 (no cap-and-trade), 51 (carbon tax).

in the Draft EA.¹¹² As a result, the Draft EA does not address whether "limited opportunities for linkages" renders a non-cap-and-trade alternative infeasible.

The inconsistency between "policy criteria" and "project objectives" undermines the Draft EA's informational value. To the extent perceived limitations on "linkages" provide a rationale for rejecting a non-cap-and-trade alternative, the Draft EA fails to support that rationale with any analysis or evidence. Rejecting an alternative on the basis of such limitations would be legally questionable in any event; an environmental analysis may not define project objectives in an "artificially narrow" way that forecloses meaningful consideration of alternatives and effectively predetermines the result. (North Coast Rivers Alliance v. Kawamura (2015) 243 Cal.App.4th 647, 668-70.)

The Proposed Scoping Plan's apparent conflation of "linkages" with "cap-and-trade" also unnecessarily constrains its assessment of alternatives. While ARB is required by statute to "consult with other states . . . to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs" (Health & Safety Code § 38564), nothing in the statute limits these "integrated" programs to cap-and-trade programs. The Proposed Scoping Plan and Draft EA thus fail to contemplate any options for regional, national, and international collaboration other than carbon market linkages. More importantly, neither document offers any estimation of the extent to which the loss of carbon market linkages would impede greenhouse gas reductions in California or abroad. Again, absent such analysis in either the Proposed Scoping Plan or the Draft EA, ARB cannot rationally conclude that a non-cap-and-trade alternative is infeasible on the basis of its inability to provide "linkages" with other programs.

152-10 cont.

The Draft EA further fails to establish that non-cap-and-trade alternatives are actually infeasible within the meaning of CEQA. At least some of the alternatives described in the Draft EA do not appear to match the alternatives evaluated in Proposed Scoping Plan Appendices D and E. Those appendices, moreover, at best show that one or two non-cap-and-trade alternatives may be more costly than the proposed scenario; they do not, by themselves, adequately establish that such alternatives are economically impracticable or otherwise infeasible.

Finally, it seems that neither the Proposed Scoping Plan nor the Draft EA undertook to craft a good-faith non-cap-and-trade alternative that could feasibly achieve the emissions reductions required under SB 32 while avoiding the continuation and exacerbation of environmental burdens associated with cap-and-trade. The Proposed Scoping Plan and Draft EA should have identified and evaluated the most cost-effective measures for closing the "gap" between the reductions expected to be achieved by refinery measures and the reductions necessary to meet the 2030 target. Absent such an evaluation, the Draft EA fails to consider an adequate range of reasonable alternatives, as CEQA requires.

¹¹² Draft EA at 175-77.

VII. Conclusion

Thank you very much for your consideration of these comments. We look forward to working with ARB staff and members of the Board to improve the Proposed Scoping Plan and Draft EA at this critical juncture in the state's efforts to help avoid the worst impacts of climate change.

Sincerely,

Kevin P. Bundy Brian Nowicki

Senior Attorney California Climate Policy Director

Encl.: List of References Cited

REFERENCES CITED AND ATTACHED

- Achat, D.L., et al., Quantifying consequences of removing harvesting residues on forest soils and tree growth A meta-analysis, 348 Forest Ecology & Mgmt. 124 (2015)
- Achat, David L., et al., Forest soil carbon is threatened by intensive biomass harvesting, Scientific Reports 5:15991 (2015), doi:10.1038/srep15991
- Ackerman, F., and E. Stanton, The Social Cost of Carbon, A Report for the Economics for Equity and the Environment Network (2010)
- Ascent Environmental. 2012. Cabin Creek Biomass Facility Project Draft Environmental Impact Report, App. D (July 27, 2012)
- BAE Urban Economics, CEQA in the 21st Century: Environmental Quality, Economic Prosperity, and Sustainable Development in California (August 2016)
- Bird, D.N. et al. 2011. Zero, one, or in between: evaluation of alternative national and entitylevel accounting for bioenergy. Global Change Biology Bioenergy 4: 576-587
- Bruckner, Thomas et al., "2014: Energy Systems. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA (2014)
- Cai, Y., et al., Risk of multiple interacting tipping points should encourage rapid CO2 emission reduction, 6 Nature Climate Change 520 (2016)
- California Air Resources Board, Compliance Offset Protocol: U.S. Forest Projects at 30 (June 25, 2015)
- California Public Utilities Commission, Energy Division, CPUC Staff Concept Paper on Integrated Resource Planning at 6 n.1 (Aug. 11, 2016)
- Campbell, John L., et al., Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Front. Ecol. Env't (2011), doi:10.1890/110057
- Carbon Tracker Initiative. "Unburnable Carbon Are the world's financial markets carrying a carbon bubble?" (2013)
- Climate Action Tracker, USA data (2017)
- Center for Biological Diversity, Comments on Docket No. 16-OIR-05: Pre-Rulemaking Updates to the Power Source Disclosure Regulations (March 15, 2017)
- Center for Biological Diversity, Comments on Proposed Compliance Plan for the Federal Clean Power Plan (Sept. 19, 2016)

- Center for Biological Diversity, Comments on Public Workshop on Carbon Sequestration Modeling Methods and Initial Results for the Natural & Working Lands Sector in the 2030 Target Scoping Plan (Jan. 13, 2017)
- Center for Biological Diversity, Comments on Second Set of Proposed Modifications to the AB 32 Greenhouse Gas Cap-and-Trade Regulation (Sept. 27, 2011)
- Center for Biological Diversity, Comments on the Proposed Greenhouse Gas Cap-and-Trade Regulation (December 15, 2010)
- Center for Biological Diversity, Comments on the Proposed Short-Lived Climate Pollutant Strategy (May 26, 2016)
- Clark, J. et al. 2011. Impacts of Thinning on Carbon Stores in the PNW: A Plot Level Analysis, Final Report (Ore. State Univ. College of Forestry May 25, 2011)
- Climate Action Tracker, USA data (2017)
- CPUC and California Energy Commission Staff, Options for Setting GHG Planning Targets for Integrated Resource Planning and Apportioning Targets among Publicly Owned Utilities and Load Serving Entities at 1 (Feb. 10, 2017)
- Cushing, Lara J., et al., A Preliminary Environmental Equity Assessment of California's Cap and Trade Program
- Ecoshift Consulting, et al., "The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels," Prepared for Center for Biological Diversity & Friends of the Earth. (2015)
- Energy and Environment Daily, Clean Power Plan Hub, at http://www.eenews.net/interactive/clean_power_plan/states/california (visited May 18, 2016)
- Gunn, J., et al., Manomet Center for Conservation Sciences. 2010. Massachusetts Biomass Sustainability and Carbon Policy Study: Report to the Commonwealth of Massachusetts Department of Energy Resources
- Hardy, Colin C., Guidelines for Estimating Volume, Biomass, and Smoke Production for Piled Slash, U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-364 (1996)
- Harmon, Mark E., et al., Modeling Carbon Stores in Oregon and Washington Forest Products: 1900-1992, 33 Climatic Change 521, 546 (1996)
- Haya, B. 2013. California's carbon offsets program the offsets limit explained
- Haya, Barbara, Research Fellow, Berkeley Energy & Climate Institute, University of California, Berkeley. Comments on California's proposed REDD program and linkage with Acre, Brazil, submitted June 4, 2016
- Holtsmark, B. 2013. The outcome is in the assumptions: analyzing the effects on atmospheric CO2 levels of increased use of bioenergy from forest biomass. Global Change Biology Bioenergy 5: 467-473

- Hudiburg, T.W. et al. 2011. Regional carbon dioxide implications of forest bioenergy production. Nature Climate Change 1: 419-423
- IPCC, "2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers," (2013)
- IPCC, "Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. (2014)
- Kelly, Erin Clover and Marissa Bongiovanni Schmitz, Forest offsets and the California compliance market: Bringing an abstract ecosystem good to market, 75 Geoforum 99, 106 (2016)
- Knapp, P.A. et al. 2013. Mountain pine beetle selectivity in old-growth ponderosa pine forests, Montana, USA. Ecology and Evolution 3: 1141-1148
- Le Quéré, Corrine, et al., "Global Carbon Budget 2016," 8 Earth Syst. Sci. Data 605 (2016)
- Mackey, Brendan, et al., Untangling the confusion around land carbon science and climate change mitigation policy, 3 Nature Climate Change 552 (2013), doi:10.1038/NCLIMATE1804
- McKechnie, Jon, et al., Forest Bioenergy or Forest Carbon? Assessing Trade-Offs in Greenhouse Gas Mitigation with Wood-Based Fuels, 45 Environ. Sci. Technol. 789 (2011)
- Melillo, Jerry M., "Climate Change Impacts in the United States: The Third National Climate Assessment," Richmond, Terese (T.C.) and Gary W. Yohe, Eds., U.S. Global Change Research Program, (2014)
- Mitchell, S.R. et al. 2012. Carbon debt and carbon sequestration parity in forest bioenergy production. Global Change Biology Bioenergy 4: 818-827
- Moore, F., and D. Diaz, Temperature impacts on economic growth warrant stringent mitigation policy, 5 Nature Climate Change 127 (2015)
- Oil Change International, "The Sky's Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production," (Sept. 2016)
- Partnership for Policy Integrity, CO2 Emission Rates from Modern Power Plants (2016)
- Raupach, Michael et al., "Sharing a quota on cumulative carbon emissions," 4 Nature Climate Change 873 (2014)
- Repo, A. et al. 2010. Indirect carbon dioxide emissions from producing bioenergy from forest harvest residues. Global Change Biology Bioenergy 3: 107-115
- Ricke, Katharine L., and Ken Caldeira, Maximum Warming Occurs About One Decade after a Carbon Dioxide Emission, 9 Environ. Res. Lett. 124002 (2014), doi:10.1088/1748-9326/9/12/124002

California Air Resources Board Re: Proposed 2017 Climate Change Scoping Plan Update and Draft EA April 10, 2017

- Rogelj, Joeri et al., "Energy system transformations for limiting end-of-century warming to below 1.5°C," 5 Nature Climate Change 519 (2015)
- Rogelj, Joeri et al., "Differences between carbon budget estimates unraveled," 6 Nature Climate Change 245, (2016)
- Schleussner, Carl-Friedrich. et al., "Differential climate impacts for policy-relevant limits to global warming: the case of 1.5C and 2C," 7 Earth Systems Dynamics 327 (2016)
- Schulze, E.-D. et al. 2012. Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral. Global Change Biology Bioenergy 4: 611-616
- Searchinger, T.D. et al. 2009. Fixing a Critical Climate Accounting Error. Science 326: 527
- Ter-Mikaelian, Michael T., et al., The Burning Question: Does Forest Bioenergy Reduce Carbon Emissions? A Review of Common Misconceptions about Forest Carbon Accounting, 113 J. Forestry 57 (2015)
- United Nations Framework Convention on Climate Change, Subsidiary Body for Scientific and Technological Advice, "Report on the Structured Expert Dialogue on the 2013-2015 review," FCCC/SB/2015/1NF.1 (2015)
- U.S. Environmental Protection Agency Science Advisory Board. 2012. Science Advisory Board Review of EPA's Accounting Framework for Biogenic CO2 Emissions from Stationary Sources 7 (Sept. 28, 2012)
- United Nations Framework Convention on Climate Change, Conference of the Parties, Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9, (Dec. 12, 2015)
- Weitzman, Martin L., GHG Targets as Insurance Against Catastrophic Climate Damages, National Bureau of Economic Research Working Paper No. 16136 (2010), available at http://www.nber.org/papers/w16136

Letter 155

Comments on the California Air Resources Board's January 2017 Draft Scoping Plan for the State of California Climate Change Program

To be Submitted Monday April 10, 2017 by email by 5 pm

Amy D Kyle, PhD MPH, School of Public Health, University of California Berkeley* (Ret) Martha Dina Argüello, Executive Director, Physicians for Social Responsibility, Los Angeles

^{*} Institution for identification only

Introduction

California has led the way on climate policy by setting targets for reductions in greenhouse gas emissions, implementing a wide array of strategies, and achieving reductions. The Legislature provided that climate policy also maximize environmental and economic benefits to the people of the state, protect disadvantaged communities, reduce air pollution, and improve public health.

"Scoping" Plans developed by the ARB lay out possible actions across sectors at a conceptual level, allowing for comparison of approaches and consideration of the provisions of the statutes. The process allows for public engagement in consideration of choices available and their implications. The ARB adopted the initial Scoping Plan in 2008, endorsed it again in 2011 and modified it in 2013. As the climate program develops, it becomes a bigger task to describe the available options and analyze them.

The 2017 Scoping Plan responds to actions by Governor Jerry Brown and the Legislature adopting targets for 2030 and 2050 that requiring more extensive reductions in greenhouse gas emissions. The transition to the new targets is a very important step forward in the program, and the consideration of a new scoping plan brings that into focus.

While the plan has many strengths and is an important step forward, recommendations would be to:

- Ensure that other scenarios including "Cap-and-Trade" and alternatives are considered according to criteria from the statutes;
- Incorporate equity and public health as core elements;
- Seek opportunities to achieve air quality gains in nonattainment areas and disadvantaged communities in the near term and develop the data and metrics to support this;
- Support actions by people and communities to reduce climate impacts and improve health;
- Discuss options and actions in light of the end game for 2050 to avoid regrettable investments and maximize benefits.
- Clearly define a path to a carbon free economy and a just transition away from fossil fuels
- Continue working with the EJAC beyond the scoping plan phase
- Increase communication and collaboration to ensure CARB moves beyond the current regulatory silos to insure more effective regulatory development

The overall structure and content of the plan and related documents should be redesigned to better support public understanding of the climate program, and additional suggestions to achieve this are included as an appendix for consideration for the future.

Analyze Scenarios including "Cap-and-Trade" According to the Statutes

One reason that the Scoping Plan is so important is because it represents the one place where different options and approaches can be assessed and considered in a comparative way. At later steps, individual options are analyzed individually. The comparative approach is where we can analyze options with regard to the criteria set out in the statutes, as well as other criteria that may be relevant.

In passing AB 32 in 2006 and SB 32 in 2016, the Legislature recognized that meeting greenhouse gas reduction targets requires transformation of the energy system of the State of California and saw this as an necessary step and an opportunity to lead. The Legislature wanted the transformation to provide as many benefits to the people of the State as feasible while achieving emission reduction goals. Statutes refer to maximizing overall environmental and economic benefits, reducing air pollution, protecting and investing in disadvantaged communities, and advancing public health. These criteria are to be considered in the selection of the elements of the program as a whole.

The 2017 plan does not do this. The alternatives should be fairly assessed according to the criteria of AB 32 and SB 32. These include maximizing economic and environmental benefits to the people of the state, protecting disadvantaged communities, and reducing air pollution.

One particular concern that arose with the passage of AB 32 and the first scoping plan is that "cap-and-trade" is likely to push emissions toward disadvantaged areas because it does not provide any limits on individual facilities or areas. In general, polluting facilities and adverse conditions are distributed toward communities of color and communities of lower income as a result of long standing social, economic and institutional forces. Facilities that emit greenhouse gases usually emit other air pollutants that impact the health and air quality at the local and regional level. The so-called "disadvantaged" communities were and are rightly concerned that a cap and trade program could allow for increases in toxic emissions to be disproportionately distributed toward already disproportionately impacted communities.

Recent analyses suggest that these concerns have merit. Findings from a respected academic research group ¹ and the Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency ² suggest that there may be greater emissions

155-1

¹ Lara J. Cushing, Madeline Wander, Rachel Morello-Frosch, Manuel Pastor, Allen Zhu, and James Sadd. A Preliminary Environmental Equity Assessment Of California's Cap-and-Trade Program. September 14, 2016. <a href="http://dornsife.usc.edu/PERE/enviro-equity-cap-action-equity-cap-

OEHHA. 2017. Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities: Initial Report. Office of Environmental Health Hazard Assessment California, Environmental Protection Agency. February 2017. https://oehha.ca.gov/media/downloads/environmental-justice/report/oehhaab32report020217.pdf (Accessed March 17, 2017).

from stationary sources in disadvantaged communities than in other communities during the implementation of cap-and-trade. These reports are an important early warning sign and merit immediate corrections in the measures used to meet our climate targets.

Moreover, the plan takes the view that improving conditions for disadvantaged communities is important only with regard to distribution of revenues from the cap-and-trade program. This is not sufficient. It is very important to invest revenues for disadvantaged communities. Revenues from cap-and-trade have supported outstanding projects and created benefits to communities. (The two members of the Environmental Justice Advisory Committee (EJAC) who represent groups and communities funded by such projects provide great testimonials to how important these projects can be.) But this is not sufficient. Protection for disadvantaged communities needs to be considered to the selection of elements for the program as a whole.

155-1 cont.

2. Incorporate Equity and Public Health as Core Elements

Consideration of equity and public health are written into the statutes for the climate program and reflect a core concern of environmental justice groups. The 2013 Scoping Plan indicated that the ARB would carefully assess health and environmental justice implications of the climate program. However, the Scoping Plan does not appear to show progress on public health and equity analysis or results. Some research projects are mentioned, but otherwise this is a gap that must be addressed.

The Scoping Plan continues to include significant economic analysis and modeling. Economic impacts are extensively studied and modeled. Such efforts have served the ARB well and allowed it to determine that actions are cost effective and not unduly disruptive to the economy.

Analogous progress has not been made for health and equity concerns. Virtually no attention is given to equity. The foreseeable result of this is that implementation of the plan will reinforce rather than remedy existing inequities. This squanders a valuable opportunity. It is incumbent on ARB to adopt methods to systematically consider health and equity, as it has always done for economic impacts, in ways that can inform decisions about policy options.

Track any accumulation of allowances

For policies that reduce emissions, such as cap-and-trade, it is important to determine whether emissions are increasing in some areas or for some populations. One specific action needed is to track the distribution of allowances to see if they are accumulating in particular areas, particularly in disadvantaged communities or areas that are at risk to become disadvantaged communities. Early warnings could be used to take actions to avoid any increased or unacceptable emissions. A broader and more aggressive early action system is needed to ensure that the impacts of the climate program as a whole can avoid further degradation in disadvantaged communities and ensure that more communities do not fall into the category of disadvantaged communities. This will require more robust and timely data than is now available. Tracking accumulations of allowances would be a first step.

Analyze equity impacts

Consideration of impacts of the mitigation policies themselves, rather than climate change or in adaptation is an important innovation in the California climate program. Much has been written about how to provide for equity in mitigation strategies among jurisdictions, understanding inequity in impacts of climate change itself, and promoting equity in adaptation strategies.

However, this is something different. It is important for the State to devise and implement ways to understand equity impacts of different potential strategies and to track these over time. This is an area that will require additional research and should be added to the Cal EPA and ARB research portfolio. A general comment is that it is typically true that actions that produce economic benefits may still produce inequitable distribution of such benefits.

Use of approaches beyond CalEnviroScreen may be needed to adequately characterize disadvantaged communities or populations facing inequities.

A few issues seem to stand out, though others may emerge as we consider this further. One concern is the distribution of financial costs of mitigation strategies. For policies that promote or require technologies for reductions in energy demand or emissions, important considerations include access and cost. Who will have access? Who will be able to pay costs? Is it equitable?

The climate program includes development of cleaner energy sources and technologies. No doubt these have great benefits. But there could be issues with regard to distribution of cost and benefits especially for technologies for vehicles and buildings to be adopted by the public. If the benefits are achieved only by those who can pay the cost of the new technology, then this will limit the distribution of benefits in ways that may not be equitable. Lower energy costs will accrue over time to those who can pay for the better technologies. What about those who cannot?

The Scoping Plan does not address how CARB and other implementing agencies will ensure that investments and the introduction of new technologies do not further imbed inequality. The distribution of benefit of innovations in the energy system as a whole may vary by strategy. Different groups may attain greater benefits from different strategies. Communities with low rates of ownership of private vehicles may benefit more from strategies that make communities more walkable and bikeable and that improve public transportation. To communities where economic circumstances preclude many or most individuals from purchasing energy efficient appliances or purchasing an zero emission vehicle we must ask how do we create programs that minimize unintended consequences and maximize benefits.

The strategies of the State climate program can incentivize investment in private vehicles and better fuels and they can incentivize investment in public transit. How do these processes lead to maximizing net benefits for the people of the state and to providing benefits to disadvantaged communities? Much can be found in the recommendations of the Environmental Justice Advisory Committee that point to how to balance these often conflicting needs.

Equity analysis could elucidate the implications of different approaches including for more decentralized strategies that could re-make and rebuild communities to produce better quality of life and better health while reducing demand for energy and thus emissions.

In some cases, known causes of inequity are more than likely already being addressed through community building and policy development and offer a great learning laboratory on how to invest in communities without displacement and what are key principles for equitable investment and development. The ARB could begin by performing at least rudimentary analyses of equity implications of its current measures and proposed future measures.

Consider health benefits in selecting strategies

The Scoping Plan should more specifically analyze options with regard to public health benefits. Another key choice is what investment will be made to improve community environments in ways that provide health benefits over the long term while also reducing greenhouse emissions. Considerable health benefits accrue from reducing air pollution and from increasing activity and social connection. They are discussed in the plan but not integrated into a strategy. This is a critical point in time to consider what has been learned from work on Sustainable Communities Strategies and in other contexts and how such strategies compared to others included in the 2017 Scoping Plan.

3. Seek Air Quality Gains in Nonattainment Areas and Disadvantaged Communities in Near Term

Transformation of the energy system and economy to address climate change could provide an opportunity to reduce air pollution throughout the State, as the ARB is of course aware. The draft scoping plan has proposed a plan for refineries to reduce emissions. This is an important initiative for an important pollution source. The question is what other targeting strategies can reduce air pollution. Despite its robust air pollution control and climate policies, California still has the worst air quality in the nation.

It would seem important to specifically address how strategies related to the climate program could improve air quality in disadvantaged communities and area that are not in attainment with the National Ambient Air Quality Standards and the California standards. Perhaps these areas should be exempted from cap-and-trade and go through mandated emissions reductions, for example. Perhaps non attainment areas would receive priority phase out of combustion sources. Other possibilities may be available and worthwhile to explore.

Make improvements to Air Toxics Programs

California has made significant reduction in some regulated hazardous air pollutants or air toxics.

The Legislature and ARB recognize that reduction in emissions of air toxics could be a benefit of the climate program. The Scoping Plan should discuss in some detail how this could occur.

It would also be important to improve the air toxics program, which has been in operation for

many years and would benefit from review and updating. The overall data system seems to reflect practices that may be able to be updated and upgraded to be more modern and timely. Recent efforts by the ARB to consolidate data through the visualization tool are valuable but do not improve the underlying data quality or timeliness.

The air toxics program is decentralized to the local air districts. That may be beneficial, but seems to lead to inconsistency in methods used to assess and manage risks of air toxics. This should be addressed to ensure that differences are substantiated for good reasons.

Data available about air toxics emissions is outdated and updated only every few years.

It is difficult to match air toxics data to greenhouse gas emissions data and criteria pollutant emissions data for the same facilities during the same timeframe. Moreover, attention to accuracy and quality control would be as important for air toxics data as it is for greenhouse gas emissions data. Perhaps similar provisions to ensure the reliability of data provided would be appropriate.

It is important that OEHHA has updated the methods for risk assessment to reflect consideration of children's environmental health, but other areas need updating as well.

It is unlikely that that current list of chemicals considered for regulation as air toxics is complete as it was developed more than two decades ago and not substantially updated since. This would be appropriate for an audit.

Moreover, the data used to characterize toxicity is incomplete and should be audited so that deficiencies can be rectified.

It would seem to be time for the State of California to develop some form of registry for regulated or managed entities to allow cross-referencing between programs.

Better data allows better analysis to avoid creating any new problems and to resolve excessive emissions that may be occurring now and to fulfill the mandates of the statutes.

The Appendix on data and metrics includes recommendations to improve data sources and develop metrics to inform climate policy and improve air quality. This was previously submitted to the ARB at the March meeting of the Environmental Justice Advisory Committee

4. Support Actions by People and Communities to Reduce Climate Emissions

The Scoping Plan focuses primarily on top-down actions to reduce greenhouse gas emissions. This is understandable since the ARB is a centralized technical agency with expertise in such strategies.

The Scoping Plan has less to say about actions by the people and communities to reduce greenhouse gas emissions and improve health. Over the long term, supporting actions by individuals is essential to the success of the overall program.

The ARB has had the foresight to work with the Environmental Justice Advisory Committee (EJAC), to conduct workshops around the State to discuss climate change and obtain community suggestions for strategies within the Scoping Plan This brings different voices, perspectives, and capabilities into the discussion, and ARB is to be commended for supporting it.

The EJAC has provided an extensive set of recommendations to the ARB about actions informed by individuals and communities. These cover topics not specifically addressed in the Scoping Plan and provide an important complement to the ARB work.

The ARB has developed a "crosslink table" to communicate its responses to these recommendations. However, the Scoping Plan does not focus on many of the types of issues raised by the EJAC and this approach does not appear to be highly productive.

The EJAC recommendations have been developed through a process of consultation with community groups and among the EJAC members themselves. It has not been supported by the type of technical analysis and assessment that support the recommendations from the ARB staff. This creates some discordance between the products of the EJAC and the ARB.

It would be valuable to capture the rationale for the EJAC recommendations and record the substantiation as developed at the community meetings and the EJAC discussions. This could be done by the process facilitators. This would provide a more complete background to the recommendations and might allow for the common themes and points of connection to be better described.

It may be that the EJAC recommendations would best be considered along with the Scoping Plan rather than simply be added as an appendix. The EJAC perspective is in many ways more relevant to communities. The Scoping Plan is more concerned with top-down solutions. Both can play important roles, but they are not the same. Perhaps a new chapter could be added for community-oriented strategies that would bring the EJAC recommendations into the plan and build on them. The Scoping Plan needs a way to consider the value of community based investments alongside technology investments and standards.

5. Discuss Current Options and Actions in Light of the End Game for 2050 and Avoid Regrettable Investments

The 2013 revision to the Scoping Plan (published in May 2014) set out an agenda for the climate program as a whole to meet targets for 2050. These included

- (a) conversion to electricity as the principal energy source for buildings and passenger vehicles;
- (b) use of "renewable biofuels" for non passenger vehicles:
- (c) mass deployment of distributed generation of electricity;
- (d) development of vastly increased storage capacity for the electricity grid, including both distributed and centralized elements and creation of capacity to shift load at times of peak demand;

- (e) changes in activity to reduce demand for travel;
- (f) increased efficiency of appliances, electronics and buildings to reduce energy demand;
- (f) widespread conversion to zero energy demand buildings.

This is a serious agenda with serious implications. It would seem important to bring this into the 2017 Scoping Plan.

Avoid sinking investment into facilities that must be superseded

The implications of a long term shift toward electrification using clean renewable energy seems to be missing from this report. 2050 is only 33 years away.

Given a shift of electricity generation toward clean renewable sources, what are the implications for construction of power plants? Is further investment in combustion based power plants misplaced at this time, given a 50 year expected lifetime for power plants. Ratepayers pay the costs of unneeded power plants. The LA Times has recently reported that Californians' electricity rates are elevated in part due to construction of too much excess capacity in generation of power from natural gas. ³

It would be best to avoid investing in actions that will need to be superseded later. For example, the State has invested in a transition to natural gas for electricity generation and other purposes. Yet, to meet the 2050 goals, burning of any fossil fuels including natural gas will need to be minimized. ARB must be bolder in its efforts to reduce the need for burning natural gas as a so called bridge fuel and ensure that it is investing the development of effective zero emission technologies. How does the ARB determine the correct pace for investment to avoid over-investing in solutions that are not sufficient in the long run and will increase pollution in the short run?

³ Ivan Penn and Ryan Menezes. Californians are paying billions for power they don't need. Los Angeles Times. February 5, 2017. http://www.latimes.com/projects/la-fi-electricity-capacity/ (accessed March 17, 2017)

Appendix 1. Data and Metrics for Climate Change Policy, Health and Equity

Note: metrics are to be designed to be comparable across areas and over time

I. Unified Source Inventory Matched to CalEnviroScreen

- Develop a registry or unified set of sources of air pollution and/or greenhouse gases for the State of California that draws on the existing inventories and sources but provides a single identifier and characteristics information for each source. This may use a "registry" type of data structure that allows the underlying systems to remain intact as long as all information may be accessed through the registry or other meta data system.
- Provide accurate and usable geocodes for all sources.
- Provide overlays of CalEnviroScreen and the inventory sources that can be used together.

II. Unified Reporting Timeframes

Create a unified reporting timeframe for all greenhouse gas and air pollution sources so that monitoring and other data can be viewed for consistent time periods.

III. Climate Change Emissions

A, Each Greenhouse Gas (each gas separately)

- California statewide, county, census tract, and facility totals for emissions of each greenhouse gas by month and year
- Totals for disadvantaged communities and other communities of each greenhouse gas by month and year
- Equity analysis: metric for intensity of emissions by race/ethnicity and by income by year

Total adjusted greenhouse gases (in MMTCO₂E) by month and year

- California statewide, county, census tract, and facility totals for emissions of total adjusted greenhouse gases by month and year
- Totals for disadvantaged communities as identified by CalEnviroScreen and other communities of total adjusted greenhouse gases by month and year
- Totals for total adjusted greenhouse gases for areas that are in nonattainment for criteria pollutants and for those that are in attainment by year

- Equity analysis: metric for intensity of total adjusted greenhouse gases emissions by race/ethnicity and by income by year
- · Equity analysis: metric for intensity of emissions by income by year
- Health analysis: identify areas with health impacts or susceptible population for special analysis

Allowances

- California statewide, county, census tract, and facility totals for allowances by year
- Totals for disadvantaged communities as identified by CalEnviroScreen and other communities of allowances by month and year
- Totals for allowances gases for areas that are in nonattainment for criteria pollutants and for those that are in attainment by year
- · Equity analysis: metric for intensity of emissions by race/ethnicity by year
- Equity analysis: metric for intensity of emissions by income by year
- Health analysis: identify areas with health impacts for special analysis or by susceptible population?

Assessment Issues:

- What can be tracked in real time? How could we see greenhouse gas emissions in real time?
- What other types of sources should be tracked beyond those that have allowances, particularly those related to transportation?
- Can we identify the areas of origin for impacts on disadvantaged communities (such as upwind sources that affect them)?
- · Can we identify areas that are at risk of becoming "disadvantaged"?

IV. Air Pollution: Air Toxics and Hazardous Air Pollutants

Assessment Issues:

- How can we get the emissions numbers into real time?
- How good is the list of toxics that are included in the reporting system? Are there
 any cases where an identified air toxic has been managed and reduced by replaced
 by something else that has not been tested or is not in the system?

- Which air toxics are monitored and which are estimated? How good are these methods?
- What is the range of methods that local air districts use to prepare emission inventories? Do these result in differences in characterization between district? Is there any scientific justification for any differences? What would be involved in standardizing these methods?
- Methods for emission inventories: Develop analysis and documentation of changes in emissions inventory methods (statewide and by district). Determine how these changes are likely to affect emissions estimates and what would be needed to provide estimates that could be comparable from year to year.
- Background:

Facility emissions are reported first from facilities to the air district, then from air districts to the ARB. There are opportunities or revision to emissions estimates at the district and the ARB. ARB estimates do not always match the district estimates. It is not clear which estimates are used to prepare hot spots risk assessments (to inform notification levels or risk reduction measures). The adequacy of the current lists of toxic air contaminants and hazardous air pollutants needs to be audited as these lists are many years old and not likely to reflect all pollutants of concern.

Air Toxics Emissions:

Each Toxic Air Contaminant of Hazardous Air Pollutant

- California statewide, county, census tract and facility level totals for emissions
 of individual toxic air contaminants and hazardous air pollutants by month and
 year
- Totals for disadvantaged communities and for other communities by month and year
- Equity analysis: metric for intensity of emissions by race/ethnicity and by income by year
- Health analysis: identify areas with health impacts or susceptible populations for special analysis?

Total adjusted air toxics and hazardous air pollutants combined

- Develop metric for total air toxics and hazardous air pollutants combined
- California statewide, county, census tract and facility level totals for emissions
 of total toxic air contaminants and hazardous air pollutants by month and year
- Totals for disadvantaged communities and for other communities by month and

year

- Equity analysis: metric for intensity of emissions by race/ethnicity and by income by year
- Health analysis: identify areas with health impacts or susceptible populations for special analysis?

Criteria Pollutants

Each Criteria Pollutant

- California statewide, county, census tract and facility level totals for emissions
 of individual criteria air pollutant by month and year
- Totals for disadvantaged communities and for other communities by month and year
- Totals for areas that are in nonattainment for criteria pollutants and for those that are in attainment by year
- Equity analysis: metric for intensity of emissions by race/ethnicity and by income by year
- Health analysis: identify areas with health impacts or susceptible populations for special analysis?

Total adjusted criteria air pollutants combined

- Develop metric for criteria air pollutants combined
- California statewide, county, census tract and facility level totals for emissions
 of total criteria air pollutants combined by month and year
- Totals for disadvantaged communities and for other communities by month and year
- Totals for areas that are in nonattainment for criteria pollutants and for those that are in attainment by year
- Equity analysis: metric for intensity of emissions by race/ethnicity and by income by year
- Health analysis: identify areas with health impacts or susceptible populations for special analysis?

Note: This equity analysis should be be completed by OEHHA

Note: These metrics are relevant to AB 197 as well.

Appendix 2: Information Design for the Scoping Plan

The climate policy program of the State of California is a model for the nation and the world. The robust program includes many elements that are being developed through many processes by many parties. This is exciting and productive. It is also a challenge for the people of the state to follow and understand. It would be beneficial to establish an information design framework to consistently collect and present data and information about the program as a whole and the choices being made at each step. This could be done in a way that allows different levels of engagement and different levels of interest in understanding details.

Some initial suggestions for the scoping plan document are included here, but this should be seen as part of a coordinated effort. Certain elements of the Report Card for the climate program, for example, would be relevant to include, as well as certain elements from the interagency documents.

Design Scoping Plans to Better Explain the Current Program and Options for Future Action

The Scoping Plan draft is a complex document. These are suggestions to make the document more understandable to the public and more helpful in understanding the overall trajectory of the California climate program.

a. Explain where are we now

It would be helpful to orient readers by showing readers what has been accomplished so far. The 2013 Scoping Plan update (released in 2014) provides a model. It explained policies that were adopted, whether they were successfully implemented, and how the Air Resources Board (ARB) viewed their future prospects. This would be appropriate for each scoping plan. Explaining the starting point helps the reader assess the options ahead.

b. Present information in a consistent order

The plan would benefit from a stronger structure. The text jumps around between material that provides introduction, background, scientific findings proposed actions, and general explication. The reader would benefit if it had from a stronger narrative structure.

c. Develop and use consistent metrics and graphics

Consistent information allows people to easily compare where we are now with where we were before. The ARB has developed informative presentations of information in some contexts, but they seem to be lacking in this draft. As yet, a consistent design for information is not apparent.

The public would benefit from an intentional information design for the Scoping Plan and related presentations. Such an information design would include important metrics and understandable graphics presented in a consistent way that is easy to understand. There may

be some material from the climate report card project that could be adapted for this purpose.

There is broad recognition of the value of metrics to track program progress and understand impacts of the climate program. It seems somewhat surprising that metrics are very limited in the Scoping Plan. As noted previously, this makes it harder to understand what was expected and what was achieved.

As a general comment, to provide valuable insights to the public, it would be very helpful for the ARB to adopt and use metrics that can show key elements and progress. They should be related to the design of the program as a whole.

d. Identify Action Items clearly

Possible or proposed action items appear in many places in the document, including "Scenarios," "Sectors," and "Achieving Success." It is difficult to find them, and to understand the logic behind this organization. Perhaps an index of action items and a summary table of recommended actions and associated reductions as included in the 2008 scoping plan could be added. It is baffling why some items are included in sectors and scenarios and others in achieving success, as there is overlap between scenarios and sectors. One would hope that all of the actions would contribute toward success, not just some of them.

Details on Metrics and Graphics

Showing the numbers on the targets

The first data provided is graph 1-1 at page 13 of the full text. It is entitled "California GHG Inventory Trend" but what it shows is the changes in total greenhouse gas emissions from 2000 to 2014 on a graph with a scale that goes to 2020. It is intended to show progress toward the 2020 target. This graph is helpful and illustrates how far we have come. It would seem to belong earlier in the text as part of the introduction. You could add a second version that extends out to 2050 and then shows how far we have to go. The graph is now placed in a rather puzzling explanation about the methodology of the reporting into the GHG emissions inventory. This graph is helpful but could be made more understandable. Suggestions are

included in the endnotes. 4

Showing the numbers on the emissions

The next data are presented as two very small pie charts that show "Emissions by GHG" and Emissions by Sector. These graphs show 2014 emissions, now three years ago. These are the only illustrations of emissions included in the Scoping Plan.

One thing that would be interesting would be to see whether these have changed since the outset of the program in absolute or relative terms. Have they? Could that be added here?

These graphs would benefit from some additional attention. For one thing, perhaps they

⁴ First, the graph could show the "2020 Target" explicitly. This is now shown by a horizontal line that starts in 2000 and continues to 2020 labeled as "2020 limit = 431." I am sure this makes sense to those steeped in this work but to the casual reader it may be hard to make sense of it. First, the document consistently uses the word "target" not "limit." When you use a different word, it suggest that you mean something different. So the reader has to puzzle out whether the "limit" is the same thing as the target. Moreover, the line starts in 2000, while the target it intended to be reached only by 2020. So it doesn't make sense. In addition, there is another entry that says 2020 limit = 260 using a line color and thickness that is identical to those that denote the value for the left axis. This is baffling because this graph, despite its title, is about progress toward the 2020 target, and the 2030 targets are not under discussion here.

One small additional point of needless complexity is the use of two decimal places for the left hand axis. Why would you write out the numbers as if there are five significant figures?

As a general matter, it is easier to understand data if presented across a consistent time line in a consistent way. Recall that the targets are expressed in terms of 1990 emissions. Yet the graphs generally do not show 1990. Why not? It will be easier to visualize what a reduction to 1990 emissions would be if you show the emissions of 1990. Then anyone can see that the 1990 emissions level is the same as the 2020 target (or "limit). It is easier for people to compare the various targets and numbers if the range of years included is consistent.

It would make sense for the ARB to develop a format to consistently show the current target period, now from 1990 to 2030. You can always use a second detailed graph is there were some detail in the pattern that could not be illustrated at that scale.

could be a bit larger and thereby easier to read. Additional suggestions are at the endnote. 5

The black carbon data are shown entirely separately. It is not entirely clear why. helpful to the reader. This text does not put the black carbon numbers into perspective as related to the other numbers presented here and is baffling. There is better information in the 2013 Plan that might be appropriate to add here.

Then the transition to the next paragraph after table 1-1 would seem to deserve some kind of new heading, as it moves on into a discussion of the fact that the state hasn't done anything on natural and working lands as yet. That might merit some subtitle at least, as it now appears to be part of a section on black carbon.

The ordering of this text seems random, as the draft discusses some of the arcane points about what is and isn't in the inventory and refers to multiple other sources before it gets around to describing the 2030 target that is the point of the entire document finally at page 16. The paragraph 2 on page 16 also refers back to the Paris agreement. This bouncing around through the document is difficult for any reader to follow. Later at page 16, the document returns again to the subject of tracking emissions, which had been discussed starting at page 13. The paragraphs seem to lack a clear order. Page 13 starts with tracking emissions, talks about methods, shows the pivotal table 1-1 (discussed above) about progress in reaching targets, briefly discusses that transportation is the largest sources, then talks about how methane is the second most important greenhouse gas.

On page 26, in a section called Setting the Path to 2050, which is Part 7 of this chapter, a graph shows the emissions trends from 2000 to 2014 with a projection to the 2020 target. This is positive because it shows the 2020 target as a target and not an ambiguous line starting from 2000. Moreover, it shows the 2030 and the 2050 targets as targets (not limits). This graph is valuable because it shows the magnitude of the reductions that would be needed to achieve these later targets. It would be improved by adding 1990 so that people could visualize the targets as they relate to the 1990 baseline.

Unfortunately, this graph also tries to introduce some partially developed ideas about a path

⁵ For Figure 1-2 Emissions by GHG, the use of the term "GHG" here is not consistent with how it is used elsewhere. More typically, "GHG" is used to refer to the total greenhouse gases as weighted into MMTCO2e. The point of this graph, however, is exactly the opposite, to point out the emissions of the individual gases that are included in the combined metric. This use of the same acronym to mean something almost opposite can be very confusing to people who are not already well versed in the data. Some more informative title like: "Emissions of Individual Gases that Contribute to Global Warming in California in 2014" might be more understandable. It would also be helpful to include a legend to the graph that defines all of the abbreviations. These are defined in the text but it is hard to pick them out, and including these in the legend directly on the graph makes it clear which of the many acronyms on the page are pertinent to the graph. Moreover, the use of the legend or secondary title under this graph that says: "2014 Total CA Emissions: 441.5 MMTCO2e" seems particularly unfortunate since the whole point of this graph is to separate out the different gases that contribute to that combined metric.

toward zero emissions. This would possibly not be confusing to people who already are familiar with everything else on the graph. But to those who are trying to understand the Scoping Plan and the new targets and where we have gotten to from the baseline, adding this additional complexity is baffling. Where did the numbers come from? What is "constant progress?" The idea of "constant progress" does not seem to fit with the data even if you just look at the shape of the trend line from 2000 to 2014, which is neither straight nor on the slope of the constant progress line. But whether the notion of "constant progress" has merit or not, it is confusing to introduce it on the first graphic in this report that provides a visual representation of what is trying to be accomplished.

In addition, this graph should have a more specific title and then notes that remind the reader what the targets were and where they came from. ⁶

Another version of this graph is given as Figure II-1 at page 33. This version is good in that it finally includes the 1990 baseline level. It shows the target levels fairly clearly. The graph would benefit from a larger vertical size because this squished version makes the distance from 0 to 600 look small, and it is not. However, this graph unfortunately has added something called the Reference Scenario (BAU), which will be obscure to many not well versed in the jargon of the international discussions. (For many Americans, the acronym BAU will be understood as the Behavioral Analysis Unit on a TV crime show.) This is not defined anywhere on the graph. Again this graph lacks an explanatory legend.

Figure II-2 at page 41 introduces the concept of Cumulative Greenhouse Gas Emissions Reductions. This is in the context of trying to justify the expansion of cap-and-trade. However, the ARB should decide whether it is important to express emissions in both annual and cumulative terms. If it is, then a section should be added to the document that more fully explains the relevance of these two approaches, both in the State and in the international discussions. The explanation given here makes no sense, and the use of the two ways of reporting results and two types of numbers is very confusing.

It may be worthwhile to use both types of metrics. If so then the design of the graphics should consistently make the two types of graphs look different to help the reader recall that the two types of metrics have different contexts and purposes.

It would be helpful to include a list of tables and figure with the contents.

Table II-3 (at page 43) shows estimates changed in GHG emissions by sector in MMTCO2e from 1990. However, none of these numbers match any given in the introductory chapters. Why go back to 1990 here when the numbers in the previous chart are from 2014? It may very well be appropriate to show changes from 1990, but from this we cannot determine how much of that was already achieved by either 2014 or 2020 and it seems like a very odd way to show this.

⁶ In publications, it is a basic principle that each graph should be understandable on its own without having to skim the accompanying text. That is because many people skim the graphs and figures first to try to get a sense of the content. Moreover, the graphics could stand alone and used to help in other contexts.

These numbers appear to be in annual emissions rather than cumulative emissions.

It is also odd that the cap-and-trade reductions are not allocated by sector in this table, though that is not specifically a data issue.

The text says:

To understand how the Proposed Plan affects the main economic sectors, Table II-3 provides estimate GHG emissions by sector compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030. The comparison helps to illustrate which sectors are reducing emissions more than others and where to focus additional actions to reduce GHGs across the entire economy.

However, this does not appear to be true since the cap-and-trade reductions are not allocated.



Letter 156

April 10, 2017

Ms. Rajinder Sahota, Branch Chief Climate Change Program Evaluation Branch California Air Resources Board 1001 I Street Sacramento CA 95814

Submitted electronically at

https://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=scopingplan2030&comm_period=N

Re: Comments on Draft 2030 Target Scoping Plan Update and Related Public Workshops

Esteemed Ms. Sahota:

On behalf of Friends of the Earth – United States (FOE-US) this letter is provided as comment on the Draft 2030 Target Scoping Plan Update (SPU) and Related Public Workshops (Workshops). As with previous submissions, this letter is not comprehensive, but the comments we provide do go to the heart of our environmental and social justice concerns regarding the road map for future California climate policy as it is presented in the SPU. Clearly there are tremendous challenges to be met, and we appreciate the enormity of the task put before the Air Resources Board (ARB) staff for developing an economically just, ecologically literate, and scientifically defensible plan for the State of California to meet greenhouse gas emissions reductions goals.

We commend the State of California political leadership for taking a public stance challenging those political forces that would suggest that global climate change does not present tremendous existential threats to human society and the planet's life systems. Though we have acute concerns that many of the proposals put forth by state agencies are misguided and lacking in scientific rigor and adequate socio-economic analysis, we are steadfast in our belief that making a priority of addressing climate change is an imperative for the State of California. Again, we appreciate the public stance regarding the importance of addressing climate change that has been taken by political leadership in the state government. Nevertheless, there is a need for urgent and dramatic action that more accurately reflects the rhetoric. Regardless of the recognition of the existential threat that is global climate change there is a failure in the SPU to go directly to the root causes of increased concentrations of greenhouse gases in the atmosphere. Because of the indifference of the SPU to fully addressing the fundamental climate science regarding the roll of fossil fuels in global climate change there are numerous shortcomings in the SPU that if not adequately addressed will result in a climate action roadmap that is simply dangerous and that will put the future generations at risk.

Soft Climate Science Denial: The Failure of the SPU to Recognize the Scientific Mandate to Keep Fossil Fuels in The Ground

The SPU makes claims about relying on contemporary climate science that do not pass the simplest of eye tests. The urgent need for California to lead the global community in a deep and rapid rehabilitation program to assist in breaking a mortal addiction to fossil fuels is not adequately recognized in the SPU. The well-known scientific consensus that confirms the imperative to keep at least 2/3 of known fossil fuel reserves in the ground is simply not addressed in the SPU. The scientific consensus that defines the mandate to keep fossil fuels in the ground is captured succinctly in an International Energy Agency study

Friends of the Earth – US 2150 Allston Way, Suite 360 Berkeley, CA 94704 USA articulating that "no more than one-third of proven reserves of fossil-fuels can be consumed prior to 2050" if the world is committed to achieving the 2 degrees' Celsius climate goals. This is consistent with the results of a study from 2015 describing how the greenhouse gas emissions contained in known fossil fuel reserves is approximately three times what can be utilized and still stay within stated objectives of keeping planetary warming below the 2 degrees' Celsius threshold, meaning that approximately 2/3 of known fossil fuel reserves must stay in the ground.2 There is little question that if California aspires to be a global climate leader that the scientific mandate to keep fossil fuels in the ground must be integrated into a climate action road map such as the 2030 Scoping Plan Update. This means that the economic implications of "stranded assets" that is directly associated with keeping known reserves of fossil fuels in the ground must also be factually and adequately addressed in the SPU in order that the SPU be economically coherent. We suggest that the ARB revise the fundamental scientific premise of the SPU to include the best available climate science that factually assesses how human economic activity is disturbing global carbon cycles. To not include this fundamental land carbon science in the SPU is to perpetuate a species of climate science denial. Failure to integrate the scientific mandate to keep fossil fuels in the ground will result in a SPU that will provide appearances of responding to the climate crisis while ultimately failing to effectively address the root causes of increasing concentrations of greenhouse gases in the atmosphere.

The Focus on Tropical Deforestation is Inappropriate and a Distraction

There are few examples that better capture the "do as I say not as I do" hypocrisy of the global north in developing climate policy than the contradictions regarding forest protection and conservation as they are presented in the SPU. Even though California is host to globally important forests, tropical deforestation is provided a great deal of attention in the SPU. This contrasts with the reduced attention put on historical and contemporary deforestation in California's globally important forests, which constitutes a real threat to local and global biodiversity, water resources and climate. While tremendous emphasis in the SPU is put on how tropical deforestation can impact California, the SPU fully fails to address in any substantive manner the primary drivers of tropical forest destruction, which are the extraction and production of commodity products such as beef, soy, palm oil, timber, minerals, and fossil fuels, many of which are consumed right here in California. The failure of the SPU to address the primary motors of tropical forest destruction turns the issue of tropical deforestation on its head.

Hypocritically, more emphasis in the SPU is put on how tropical deforestation is impacting California than how California is a prime economic motor in driving tropical forest destruction. For instance, a 2016 report by Amazon Watch, titled From Well to Wheel: The Social, Environmental, and Climate Costs of Amazon Crude, describes how California's oil refineries are amongst the worst offenders in economically driving the destruction of the rainforest in the Western Amazon. One of the main findings of the study is that California processes roughly 60% of all exports of Amazon crude from Ecuador, Perú, and Colombia.³ This is a simple fact reflecting the role of California consumption of commodities in driving tropical deforestation that is completely absent from the SPU. It is completely inappropriate and a distraction that the ARB would put such an emphasis on tropical deforestation as one of the major causes of global climate change when the motors of the destruction of the rainforest are occurring right here in California – yet these motors of destruction merit no mention in the SPU. Such hypocrisy is not befitting a state that aspires to provide global climate leadership.

¹ "World Energy Outlook 2012." International Energy Agency.

https://www.iea.org/publications/freepublications/publication/english.pdf

² McGlade and Elkins (2015) Nature **517**, 187 – 190 (08 Jan 2015)

http://www.nature.com/nature/journal/v517/n7533/full/nature14016.html

³ "From Well to Wheel: The Social, Environmental, and Climate Costs of Amazon Crude." 2016. *Amazon Watch*. http://amazonwatch.org/assets/files/2016-amazon-crude-report.pdf

Notably, this strong focus on tropical deforestation contrasts with how the SPU discusses California's forests (or fossil fuels for that matter). The ARB continues to obfuscate the greenhouse gas emissions impacts from past and contemporary deforestation and forest exploitation here in California. The ARB still fails anywhere in the SPU to describe deforestation as an historical and contemporary environmental and climate threat occurring here in California's forests. Though the SPU does make mention of the greatly publicized draft Forest Carbon Plan and includes the euphemistic "Natural and Working Lands" element in the discussion, the greenhouse gas emissions challenge that is present in California's industrialized forests and agricultural lands remains largely avoided in the SPU. Clearly the ARB has been intimately involved with the presentation of the draft Forest Carbon Plan as being at least rhetorically an important part of California climate change mitigation planning, yet the reality is that the draft Forest Carbon Plan was deficient scientifically and failed to meet basic requirements of bedrock California environmental law. 4 California's road map for climate action abdicates responsibility in the state for driving tropical deforestation and fully fails to come to terms with the climate legacy impacts of past and current forest destruction in California's forests. This is a grievous distraction that must be remedied in order that the SPU even begin to address the real threats from deforestation at home and abroad.

Addressing Deforestation and Forest Degradation in California Is an Imperative

On repeated occasions the ARB and other relevant California natural resource management agencies have spoken of the importance of forests in understanding, mitigating and responding to climate change. We support that position and are in favor of forest conservation in principle. As we have said before, and even if the ARB is not explicit in saying so, we strongly support establishing measurable and aggressive goals in reducing emissions from deforestation and forest degradation in the forests of California. This will most likely require a suite of policies that will reduce the use of the most destructive forest management activities such as clearcutting and high-density variable retention, as well as more holistic approaches to addressing the economic motors of forest destruction in California's globally important forests.

To that end, we believe that there exists an imperative that a frank and science-based assessment of the legacy and contemporary climate impacts of silviculture applications (i.e. industrial forestry, logging, and timber harvest) in California is provided as soon as possible. This includes addressing the legacy impacts of such practices in creating a landscape that is evolved to fire disturbance but exhibits volatile fire disturbance behaviors related to past deforestation and mono-culture plantation management. We are steadfast in our support for the ARB taking a key role in forging a just and equitable transition to a low emissions economic development path, most especially here at home in rural California. Having accurate data that informs a robust science-based evaluation of the climate impacts of forest management practices is crucial to California providing the international global climate leadership that ARB is so eager to promote. The draft Forest Carbon Plan was devoid of many essential climate change mitigation design principles, and was completely lacking in the appropriate environmental analysis as required by law. The failure of the Draft EA for the SPU to address the Forest Carbon Plan and to provide analysis of the climate impacts from industrial forestry activities in California's forest increases the risk that the Draft EA of the SPU is deficient. These inadequacies need to be addressed in order that the SPU be scientifically and legally defensible.

Linked Carbon Markets: More Complexity and Fewer Emissions Reductions

A recent article published in *Nature* describes directly the dangers that will arise from pursuing complex market linkages to expand the reach of the California Cap-and-Trade program.⁵ The article is explicit in

156-1

⁴ See comments provided on the draft Forest Carbon Plan, including http://www.fire.ca.gov/fcat/downloads/FCAT_PublicComment/Center%20for%20Biological%20Diversity%20et%2 0al%20Forest%20Carbon%20Plan%20Comments.pdf

⁵ Green, Jessica. 2017. Don't Link Carbon Markets. Nature. 543, 484 – 486.

describing how "carbon trading is more a political fix than an effective way to mitigate climate change." The flawed assumptions that underpin the ARB obsession with pollution trading are leading the state into dangerous territory where appearances of climate action will obfuscate the failure to reduce net emissions.

The article describes the contemporary situation:

"Linked carbon markets are difficult to manage when many regulatory authorities compete. Interactions with other climate policies trigger unintended outcomes. Policymakers find it hard to keep prices at the 'right' level — neither so high that a carbon market becomes politically unacceptable, nor so low that it fails to change behaviour. California's case shows that lawmakers can be tempted to use regulatory loopholes to drive down prices and weaken the market's effectiveness. Such problems will only worsen when more markets are linked up."

The body of evidence exposing the erroneous scientific assumptions that underpin a large part of the actual mechanics of the California Cap-and-Trade Program is substantial. What is also becoming increasingly clear is that California is at real risk of "putting in place a set of policies that appear to address climate change but allow emissions to continue to rise." The SPU must be revised to take the best available science into account in order that the analysis of alternatives be ecologically literate, scientifically grounded, and legally defensible. This will include an honest assessment of the dangers of linked carbon markets, and a step away from unquestioning promotion of assumptions that are scientifically unfounded and that the evidence does not support. We strongly recommend that the ARB step back from promoting market linkage.

High Risk International Sector-Based Offsets Must be Dropped as a Policy Recommendation

Protecting tropical forests is fundamental to effective climate change mitigation strategies. For this reason, FOE-US works extensively domestically and internationally to address the main economic drivers of tropical deforestation. Those drivers are largely the production and extraction of commodity resources for consumption on global markets, including in California, one of the wealthiest economies in the world.

The commitment expressed in the SPU to pursue linkage with Acre, Brazil, to open the door to the inclusion of International Sector-Based Offsets in California Cap-and-Trade is misdirected and colonialist. This highly controversial proposal is replete with human rights, lands rights, and indigenous rights concerns that have been extensively documented. Our organization has provided extensive comment to the ARB regarding the high-risk proposal of including International Sector-Based Offsets in the California carbon market. There are many promising opportunities for California to engage in the international arena for supporting socially just and scientifically defensible climate mitigation efforts. The expansion of California pollution trading under the rubric of Cap-and-Trade to include REDD-based offsets is not defensible scientifically nor in terms of social justice. To be clear, the fundamental premise behind the inclusion of International Sector-Based Offsets in the California Cap-and-Trade program, the idea that it is possible to "neutralize" the emissions from burning fossil fuels with carbon sequestration in forest ecosystems, is based on an erroneous assumption regarding the atmospheric impacts of human disruption of global carbon cycles. In this age of egregious climate science denial, it is exceptionally dangerous that the State of California and the proponents of including REDD-based offsets in the California Cap-and-Trade program continue perpetuating a scientifically questionable policy proposal. It is necessary for the State of California to finally move on from this high risk and dubious scheme, and as such it is essential that the International Sector-Based Offsets regime embodied in proposed linkage with Acre be eliminated from future California climate policy.

Another factor regarding proposed linkage with Acre that has been brought to the attention of ARB staff on repeated occasions but that the SPU fully fails to discuss is the deterioration in Brazil of environmental governance, of environmental regulatory institutions, and of the institutions and processes that are meant to defend the rights of indigenous peoples. Political turmoil in Brazil has resulted in extra-electoral processes leading to an anti-democratic change in the federal executive. One result of this change in the executive has been a dramatic and extreme reduction in the budgets of those environmental management and science agencies that are responsible for climate change policy implementation, including addressing deforestation, in Brazil. A recent article described the desperate situation in Brazil as environmental organizations fear budget cuts will undermine Brazilian efforts to participate in international strategies to respond to climate change. By all indications deforestation rates in Brazil have in recent years begun once again to climb. This failure to consider real world politics only further exposes California climate policy objectives to the extreme risks of International Sector-based Offsets and/or linkage with other subnational jurisdictions such as Acre, Brazil. It is well past time for the ARB to abandon this extremely risky, socially unjust, and scientifically dubious policy proposal.

Carbon Offsets Undermine Real Innovation and Will Make Things Worse

It is unfortunate that in this era of egregious climate science denial that ARB staff remain hypnotized by the scientifically dubious utilization of carbon offsetting as a climate change mitigation tool. The ongoing reliance on and proposed use of carbon offsets in various elements of California climate policy is without scientific legitimacy and is dangerously misleading. Informed analysis concludes that offsetting is worse than doing nothing because it almost certainly contributes to a net increase in the absolute rate of global emissions growth. It may look good on paper, but in the atmosphere this variety of "Enron carbon accounting" is simply not convincing, as it is a spurious argument that offsets reduce emissions to levels at or before those that would have transpired had the activity being offset not occurred.

A central problem with carbon offsetting is that the false promise of carbon neutrality triggers a rebound away from meaningful mitigation and towards the ongoing reliance on and development of further high carbon infrastructures at a time when a rapid and drastic transition needs to be undertaken by human society away from a high carbon economy. When offsetting is deemed to have equivalence with real emissions reductions at the source the incentive to move to lower carbon technologies, behaviors and practices is reduced accordingly. As we have already seen in California, carbon offsetting militates against market signals to improve low carbon travel and technologies, while politically facilitating the ongoing pursuit of capital-intensive development of high-carbon infrastructure. Our organization, based on our experience around the world, recommends that California make a strong move away from the False Solution of relying on carbon offsetting in climate policy, whether it be for local development projects or with the market-based mechanism of the California Cap-and-Trade Program.

Disconnect Between Environmental Justice Rhetoric and Substance of Scoping Plan Update

We have consistently and emphatically offered our public support for the rhetorical priority that the ARB has given to the processes and recommendations of the Environmental Justice Advisory Committee (EJAC) in the Scoping Plan Update process. The increase in material and institutional support of the EJAC has been instrumental in strengthening public participation in the Scoping Plan Update process. We hope and expect that the role of the EJAC will continue to be expanded. The EJAC is without question one of the most promising vehicles for insuring that California climate policy is built from the bottom up, and not imposed from the top down.

Based on the experience of FOE-US in the State of California, nationally in the United States, and internationally as a member of a federation of more than 70 organizations in 70 countries around the world we raise a red flag regarding the disconnect between the rhetoric regarding Environmental Justice

⁶ See "Funding gutted for Brazilian environmental agencies" (April 7, 2017) at http://www.eenews.net/climatewire/2017/04/07/stories/1060052762

⁷ Mackey et al. (2015). Untangling the Confusion Around Land Carbon Science and Climate Change Mitigation Policy. Nature Climate Change 3.

and the substance of cornerstone policy proposed in the SPU. The SPU goes to great lengths to address Environmental Justice issues and confirm the widely-understood importance of the EJAC to developing climate change mitigation policy that is socially equitable and scientifically defensible. We have brought these concerns to the attention of ARB staff on previous occasions. Unfortunately, there seems to be limited effort to integrate the top-level recommendations of the EJAC into the SPU and we remain very concerned that ARB staff are just paying lip service to Environmental Justice dynamics and issues.

In reviewing the EJAC recommendations which are included in the Appendix of the SPU even a casual reader would be struck by the way the policy proposals disregard the most important recommendations. For instance, the EJAC makes an explicit recommendation, one that has been made repeatedly by the EJAC in the various incarnations of the committee, to not make Cap-and-Trade (market-based market mechanism) a cornerstone of future climate policy. In defiance of the law, the best available science and the ARB rhetoric concerning environmental justice the SPU and accompanying scenarios reflect the intention of ARB staff to stubbornly push onwards with unjust and scientifically questionable pollution trading. The EJAC recommendations also are explicit in articulating the need to exclude International Sector-Based Offsets (REDD based-offsets) from future iterations of the California Cap-and-Trade program. Yet the SPU completely ignores those recommendations and stubbornly maps out future linkage with Acre and the eventual inclusion of high risk and dubious REDD-based carbon credits in Cap-and-Trade. The implications of this disconnect are so obvious that they do not need to be stated.

156-2

Conclusion

In conclusion of this letter we want to bring attention to several other contributions that our organization has made to the current SPU comment process. These contributions include:

- Submission of the report A School Lunch Recipe to Combat Climate Change.⁸
- Submission of a petition with the support of more than 6200 California residents requesting the
 integration of the recommendations of the Environmental Justice Advisory Committee into the
 SPU 9
- The re-submission of a comment letter that we provided in 2016 communicating concerns in regards the proposal to expand Cap-and-Trade with International Sector-based Offsets.¹⁰
- The support of and full agreement with the letter submitted by the Center on Race, Poverty, and the Environment and other organizations, and which we signed.

Thank you for your attention to this letter. Our organization will remain engaged with and attentive to ARB leadership in developing climate policy in our state that provides global and national leadership.

Respectfully,

Gary Graham Hughes

Senior California Advocacy Campaigner

ghughes@foe.org 510-900-8807

8 See

https://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=scopingplan2030&comment_num=77&virt_num=59

⁹ See https://www.arb.ca.gov/lists/com-attach/80-scopingplan2030-Wz1SJIE5BTNQOAFl.pdf

¹⁰ See https://www.arb.ca.gov/lists/com-attach/38-scopingplan2030-ATBXZld7UjNQewk8.pdf



Letter 160

April 10, 2017

RE: Proposed Scoping Plan 2030

Dear Chair Nichols and Staff:

Thank you for the opportunity to comment on the Scoping Plan Update, and for your continued leadership in addressing climate change. The plan provides a critically important opportunity to reduce the risk of catastrophic climate change - the greatest health threat of the 21st century - and to optimize the health co-benefits of climate action.

Conduct a comprehensive health and health equity assessment. The Board has previously received requests to integrate a comprehensive independent assessment of the health impacts of the strategies and scenarios outlined in the Scoping Plan, but the document provides only a cursory overview of potential health benefits that accompany reductions in toxic air pollution associated with greenhouse gas emission reductions.

We again urge you to fund a more comprehensive independent analysis of the health and health equity risks and potential benefits of each of the strategies and scenarios, as well as of the various options for implementation. The analysis should (a) include the expected direction, magnitude, and distributional aspects of the impacts and associated costs; (b) quantify health impacts and benefits to the extent feasible; (c) assess the full range of health impact pathways, including for example increases in physical activity associated with active transportation; and (d) consider whether additional GHG reduction strategies not incorporated in the current draft would add significant health benefits (eg reduced meat consumption.

A more robust consideration of health impacts and health opportunities is required by CEQA, AB 32, and AB197, and could ensure more emphasis on health and health equity as implementation options are considered. Health savings should also be integrated into the economic analysis; failure to do so artificially inflates the costs of climate mitigation. Relevant health and health equity metrics should be identified and tracked as the Plan is implemented.

Place greater emphasis on reducing vehicle miles traveled. Transportation contributes a higher proportion of GHG than any other sector, and active transportation provides the greatest opportunity for health co-benefits. Even modest shifts from vehicle travel to active transportation are associated with highly significant reductions in many chronic diseases. Yet the Plan inadequately integrates SB 375, and sets no targets for VMT reductions. We recommend that CARB incorporate ambitious and specific goals for VMT reduction, and include in the Plan itself specific strategies for meeting them. These targets and strategies should be included in the environmental analysis. VMT targets must also be aligned with

160-1

state transportation investments, and with more stringent and enforceable GHG reduction targets in the SB 375 target-setting process.

Assess and incorporate strategies to reduce carbon pollution associated with California's own fossil fuels industry. The Plan makes no recommendations for reducing the extraction, production, transport, or export of fossil fuels, although doing so could have significant long-term global health impact.

Reduce reliance on cap and trade to fill emissions reduction gap. Direct regulation offers the most straightforward path toward reducing greenhouse gas emissions and copollutant emissions from refineries and other large stationary sources, thus reducing the potential disproportionate and cumulative co-pollutant exposures in fence-line communities. Other strategies to further minimize community toxics exposures include reduction or elimination of the allocation of free allowances, and re-examination of the potential for further restriction of offsets - either geographic or sectoral. More ambitious goals for renewables and diesel emissions reductions are also technically achievable, and would reduce the greenhouse gas emissions gap that the Plan currently fills through cap and trade.

Strengthen the link between climate change mitigation and adaptation, and prioritize actions that promote climate resilience while reducing greenhouse gas emissions. Climate change impacts are already evident and more severe impacts are now inescapable. By prioritizing strategies that serve to both mitigate and adapt, health impacts of climate change can be reduced. Cool roofs, urban greening and green infrastructure, and weatherization that incorporate healthy homes upgrades for renters are but a few examples.

Implement a funded, coordinated and coherent communications campaign that emphasizes the urgency of climate action and the health and economic benefits of climate action across all sectors. While Californians are currently supportive of climate action, few understand the urgency with which we must decarbonize, the nature of the systems transformations required to do so, or the associated health benefits. And few are aware that relatively simple changes (e.g. modest increases in the use of active transportation and modest decreases in consumption of industrially produced meat) can bring significant health benefits and climate pollution reductions. A well-funded coordinated communications campaign could enhance support for significant climate action at all levels.

We look forward to working with you as you finalize and implement the updated Scoping Plan, and again appreciate your commitment to addressing climate change.

Linda Rudolph, MD, MPH

Letter 166





















April 10, 2017

Via Electronic Filing on ARB Website

Richard Corey, Executive Officer California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: Comments on the 2017 Climate Change Scoping Plan Update

Dear Mr. Corey:

On behalf of the undersigned environmental justice, public health, and allied organizations, we submit these comments on the Proposed 2017 Climate Change Scoping Plan Update ("Proposed Plan"). The organizations, individuals, and groups listed below work directly with low-income residents and residents of color who are disproportionately impacted by industrial pollution, toxic air emissions, and climate change. Climate change solutions must protect all Californians, starting with those already overburdened by air pollution and climate change.

The Proposed Plan offers a five-scenario roadmap for achieving the 2030 target established by Senate Bill 32: (1) existing measures, a twenty percent reduction at refineries ("Refinery Rule"), and

¹The twenty or thirty percent reduction in refinery emissions in the three scenarios targeted by the Board are in all cases less than the required 40 percent target for 2030, disparately leaving refinery

Cap and Trade; (2) existing measures, a refinery rule with at thirty percent reduction, no Cap and Trade, and additional direct reduction measures; (3) existing measures, the Refinery Rule, and a carbon tax; (4) existing measures, no Refinery Rule, and more reliance on Cap and Trade; and (5) existing measures, the Refinery Rule, and a cap and tax. See Discussion Draft at 32-36, 49-53.

The Proposed Scoping Plan suffers from four major deficiencies and should be revised. First, the Plan identifies Cap and Trade, existing measures, and the Refinery Rule as the Proposed Scoping Plan Scenario. Cap and Trade harms communities of color and low-income communities, with in-state emissions going up in several sectors, while out-of-state emissions reductions through divestment (resource shuffling) and out-of-state offsets provide the primary emissions reductions attributed to the program. Cap and Trade inflicts a racially disparate adverse impact on communities of color by allowing pollution trading and excessive offsets usage, which both condone pollution increases and deny the benefits of pollution reductions. Approval of a Plan that includes Cap and Trade would thus violate Government Code section 11135. Furthermore, the Board does not have the legal authority to implement Cap and Trade beyond 2020, and should thus revise the Scoping Plan accordingly.

Second, the Proposed Plan violates Assembly Bill 197, which directs the Board to prioritize direct emissions reductions when adopting rules and regulations to meet the 2030 target. The Plan only offers a twenty percent reduction at refineries as a potential direct reduction measures, and does not prioritize direct reductions at other stationary and mobile sources. The Board *shall* prioritize direct emissions reduction strategies for all the sources identified by Assembly Bill 197.

Third, the Proposed Plan inadequately analyzes the carbon tax alternative which, like Cap and Trade, would generate revenue and be subject to a Proposition 26 super-majority vote in the Legislature. The Plan fails to adequately analyze this alternative by constructing straw man carbon tax alternatives which fails to discuss and consider important, unique characteristics of California's current climate laws. The Board should thus revise the Draft to meaningfully consider a cap and tax as an alternative to Cap and Trade.

Fourth, the Environmental Analysis fails to adequately analyze and mitigate the Cap and Trade air quality impacts on public health.

166-1

- Cap and Trade is an Inappropriate Strategy and Should not be Part of the Scoping Plan to Meet the 2030 Target.
 - A. Implementation Data Indicate Communities of Color are Adversely and Disproportionately Affected.

In September 2016, leading researchers released a report assessing the inequalities in the location of greenhouse gas-emitting facilities and the amount of greenhouse gases and particulate matter

166-2

communities behind. The apparent proposal to measure the Refinery Rule based on a refinery's product output rather than its crude input reduces the transparency of future compliance for these same communities, exhibiting both of the major flaws in the agency's past approach discussed herein.

("PM10") emitted by facilities regulated under Cap and Trade.² The report also provides a preliminary evaluation of changes in localized greenhouse gas emissions from large stationary sources since the advent of the program. The report found:

- On average, neighborhoods with a facility within 2.5 miles have a 22 percent higher proportion
 of residents of color and 21 percent higher proportion of residents living in poverty than
 neighborhoods that are not within 2.5 miles of a facility.
- These communities are home to a higher proportion of residents of color and people living in
 poverty than communities with no or few facilities nearby. Indeed, the higher the number of
 proximate facilities, the larger the share of low-income residents and communities of color.
- 3. The neighborhoods within 2.5 miles of the 66 largest greenhouse gas and PM10 emitters have a 16% higher proportion of residents of color and 11% higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility.
- The first compliance period reporting data (2013-2014) show that the cement, in-state electricity generation, oil & gas production or supplier, and hydrogen plant sectors have increased greenhouse gas emissions over the baseline period (2011-2012).
- The amount of emissions "offset" credits exceed the reduction in allowable greenhouse gas emissions (the "cap") between 2013 and 2014 and were mostly linked to projects outside of California.

The Proposed Plan fails to discuss this report, its supporting data, or its conclusions, despite comments on prior iterations of the Plan raising this specific issue. The report raises significant concerns and discloses new data that should foreclose the Air Board from extending the Cap and Trade program. The report demonstrates three fundamental points that environmental justice advocates have raised for years: (1) Cap and Trade disparately affects communities of color; (2) Cap and Trade denies communities the benefits of on-site reductions; and (3) greenhouse gas reductions attributed to Cap and Trade occur primarily outside of California.³ It concludes:

166-2 cont.

Preliminary analysis of the equity and emissions impacts of California's cap-and-trade program indicates that regulated GHG emission facilities tend to be located in neighborhoods with higher proportions of residents of color and those living in poverty. There is a correlation between GHG emissions and particulate matter levels, suggesting a disparate pattern of localized emissions by race/ethnicity and poverty rate. In addition, facilities that emit the highest levels of both GHGs and particulate matter are similarly more likely to be located in communities with higher proportions of residents of color and those living in poverty. This suggests that public health and environmental equity co-benefits could be enhanced if there were more GHG reductions among the larger emitting facilities that are located in disadvantaged communities. Currently, there is little in the design of cap-and-trade to insure this set of localized results. Moreover, while the

² Lara J. Cushing, et al., A Preliminary Environmental Equity Assessment of California's Cap and Trade Program, attached as Exhibit 1.

³ Claimed reductions from imported electricity generation remain suspect given the Board's creation of safe harbor exemptions from the resource shuffling prohibition, which allow greenhouse gas emissions to continue in fact as leakage. *See* Danny Cullenward, BULLETIN OF THE ATOMIC SCIENTISTS, 2014, Vol. 70(5) 35–44, attached as Exhibit 2.

cap-and-trade program has been in effect for a relatively short time period, preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were located outside of California. Large emitters that might be of most public health concern were most likely to use offset projects to meet their obligations under the cap-and-trade program.⁴

The Board has taken no final action to assess or prevent these impacts, and instead has consistently demonstrated its intent to prevent the public from accessing facility-specific compliance data and delayed implementation of its Adaptive Management Plan. The Board has taken the position that the public may not access critical Cap and Trade compliance and trading data, claiming that compliance with Cap and Trade constitutes "confidential business information." When promulgating the Cap and Trade regulations in 2011, the Board claimed that it would assess and prevent adverse impacts through an Adaptive Management Plan. The Initial Statement of Reasons ("ISOR") for the recently proposed Cap and Trade extension admits that the Board has not finalized or implemented the Adaptive Management Plan. Ison at 302. Collectively, these two issues show how the Board withholds important information from the public regarding sources' compliance and has not prevented Cap and Trade inequities.

166-2 cont.

More recently, the Office of Environmental Health Hazard Assessment (OEHHA) released a report that analyzed the emissions data from Cap and Trade facilities. It found strong correlations between greenhouse gas emissions and PM2.5 at all facilities, and strong correlations between greenhouse gas emissions and toxics at refineries. The OEHHA Report concluded that "these analyses suggest that reductions in greenhouse gas emissions are likely to result in lower pollutant exposures in disadvantaged communities, based overall on the positive correlations observed for the 2014 data." Because of the correlations identified, when the Air Resources Board decides to allow pollution trading rather than direct reductions, it pursues a policy that denies communities living near Cap and Trade facilities the health benefits from direct reductions.

B. Approval of a Scoping Plan that Includes Cap and Trade will Violate Government Code Section 11135.

The Board has a duty under California civil rights law to ensure that its programs or policies do not inflict racially disparate treatment or result in racially disparate effects. Gov. Code § 11135. The Board will violate section 11135 if it adopts a Scoping Plan which includes Cap and Trade because, as set forth above in section I.A, Cap and Trade results in racially disparate and adverse impacts when it

⁴ Lara J. Cushing, et al., A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP AND TRADE PROGRAM at 7-9, attached as Exhibit 1.

⁵ See, e.g. Email from Edie Chang to Brent Newell, dated August 19, 2015, attached as Exhibit 3. ⁶ Even if the Board had finalized the Adaptive Management Plan, as currently proposed it would not address the section 11135 issues. The Adaptive Management Plan only proposes to take action at the Board's sole discretion when cap and trade causes an emissions increase, and does not resolve the denial of benefits issue or negate the Board's deliberate indifference.

⁷ Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities: Initial Report, attached as Exhibit 4.

denies communities the benefits of direct reductions and allows sources to increase emissions through pollution trading and offsets usage. The Board has the authority to adopt alternatives to Cap and Trade, has actual knowledge of the racially disparate and adverse impacts from the denial of benefits and localized emissions increases, yet does not adequately prevent racial discrimination prohibited by Government Code section 11135.

C. The Board should Remove Cap and Trade from the Draft Scoping Plan because the Board has no Authority to Extend Cap and Trade after 2020.

The Board lacks authority to include Cap and Trade in the Scoping Plan for reductions to achieve the 2030 target. A fundamental principle of administrative law dictates that agencies only have those powers delegated by the Legislature. The Board's authority to implement the Cap and Trade program expires on December 31, 2020 and the Board has no authority to extend the program beyond that date. Health & Safety Code §§ 38562(c), 38570.

ARB staff have claimed that AB 32 authorizes these regulations because of language in Part 3 of AB 32 related to the statewide greenhouse gas limit (the level of emissions in 1990). "It is the intent of the Legislature that the statewide greenhouse gas emissions limit continues in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020." Health & Safety Code § 38551(b). Grasping on to the words "continue reductions," the staff believe they can extend Cap and Trade to 2030 to achieve the reductions required by Senate Bill 32. Section 38551, however, must be understood in the context of the statutory scheme as a whole. The very next subsection of section 38551 directs the Board to make recommendations to the Governor and the Legislature on how to continue reductions, and does not give the Board the authority to take those actions *sua sponte*. "The state board shall make recommendations to the Governor and the Legislature on *how* to continue reductions of greenhouse gas emissions beyond 2020." Health & Safety Code § 38551(c) (emphasis added).

Nor has the Legislature acted to extend the Board's authority. During the 2015 legislative session, the version of Assembly Bill 1288 (Atkins) containing an extension of the Board's authority to implement Cap and Trade beyond December 31, 2020 did not become law. Instead, the Legislature amended Assembly Bill 1288 to add two environmental justice seats to the Board, demonstrating a legislative intent to prioritize environmental justice, not Cap and Trade. During the 2016 legislative session, Senate Bill 32 became law and requires the Board to achieve a 40 percent reduction in greenhouse gas emissions below the statewide greenhouse gas limit (1990 levels) by 2030. Stats. 2016, ch. 249, § 2, p. 88 (codified as Health & Safety Code § 38566). No provision of Senate Bill 32 amended section 38562(c) or otherwise authorized the Board to implement Cap and Trade after the year 2020. Accordingly, the Board lacks the authority to include Cap and Trade as part of the Scoping Plan.

II. The Board Must Prioritize Direct Emissions Reductions at Stationary and Mobile Sources.

Assembly Bill 197 (Garcia) expressly directs the Board to prioritize direct emissions reductions at large stationary sources, mobile sources, and all other sources. The Board has no authority to disregard direct emissions reduction strategies for the purposes of meeting the additional reductions required by Senate Bill 32. Rather, the Board must prioritize "emissions reduction rules and regulations that result in direct emission reductions at large stationary sources of greenhouse gas emissions and

direct emissions reductions from mobile sources." Stats. 2016, ch. 250, § 5, subdivision (a), p. 92 (codified as Health & Safety Code § 38562.5(a)).

Except for the Refinery Rule, which calls for efficiency increases to achieve a twenty percent reduction, the Proposed Plan fails to include any other direct reduction strategies at stationary or mobile sources to comply with Assembly Bill 197. Especially problematic are the Plan's failure to require direct reduction measures for the cement plant, power plant, oil and gas, and glass factory sectors, which all emit substantial greenhouse gas and co-pollutant emissions.

The Plan itself acknowledges that the cost effectiveness of the Refinery Rule is the same or higher than other identified direct reduction measures not included in the Proposed Plan. The cost effectiveness of the refinery rule 30 percent reduction measure, the industry measure, and the oil and gas measure are all the same as the Refinery Rule (\$70 to \$200/metric ton).⁸ Direct measures for mobile sources (Mobile Source Strategy (CFT)) offer potential cost savings at the low end of the range with a high estimate no greater than the Refinery Rule (-\$150 to \$200/metric ton).⁹

The Plan thus violates AB 197 by prioritizing Cap and Trade as a reduction strategy when the plain language of the statute directs the Board to prioritize direct reduction measures. Even if the Board had discretion – which it does not – then the Plan still violates AB 197 because the Plan offers no cogent explanation for the proposal to prioritize direct measures at refineries, but not at other Cap and Trade sources.

III. The Proposed Plan Inadequately Analyzes Carbon Tax Alternatives.

Under CEQA, the Plan must include a description of alternatives to the proposed regulatory program that minimize the significant environmental impacts of the program. Pub. Res. Code § 21080.5(d)(3)(A). This requirement is necessary to further the State's goal of "avoiding significant adverse effects on the environment where feasible," and policy that public agencies shall not approve projects if feasible alternatives would substantially lessen the significant environmental effects of those projects. CEQA Guidelines § 15250; accord Pub. Res. Code § 21002. Lead agencies must examine a reasonable range of alternatives that feasibly meet most of the project's basic objectives while avoiding or substantially reducing the significant effects of the project, even if these alternatives "would impede to some degree the attainment of the project objectives, or would be more costly." CEQA Guidelines § 15126.6(a), (b).

While the level of detail in an alternatives analysis is not subject to any precise formulation, the examination of alternatives must "include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." CEQA Guidelines § 15126.6(d). Furthermore, "the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project's impact on the environment, the agency's approval of the proposed project followed meaningful consideration of alternatives and mitigation measures." *Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 134. By offering conclusory statements and cursory discussions in place of actual analyses, improperly arguing that analysis is

166-3

⁸ See Proposed Plan, Table III-3 at 65.

⁹ Id.

speculative, and deferring analyses of alternative regulatory programs to later rulemaking procedures, ARB failed to undertake any meaningful analysis of the alternatives. This lack of analysis renders it impossible to compare these choices to the preferred alternative, undermining CEQA's goal of "foster[ing] informed decision-making and public participation." CEQA Guidelines § 15126.6(a).

The Proposed Plan sets forth a carbon tax scenario which it then strikes down as failing to meet several criteria. Proposed Plan at 50-52. The Plan first paints a carbon tax as lacking the certainty to meet the 2030 target by not having limits at facilities individually or in the aggregate (the "cap" part of Cap and Trade), and then uses an example from British Columbia. What the Plan fails to consider or disclose are several unique characteristics in California that surround a carbon tax and provide emissions certainty. First, Assembly Bill 197 prioritizes direct emissions reductions beyond the Refinery Rule which the Draft excludes from the scenario. Additional direct reductions that apply and occur <u>before</u> a carbon tax provide certainty while the carbon tax places further downward pressure on emissions.

Second, the Plan ignores the Board's on-going authority to update the Scoping Plan on a five-year interval and its authority to promulgate direct reductions to address any carbon tax-related shortfalls. The Board has the overall duty to ensure that California meets the 2030 target, and the authority to make that happen through direct emissions reductions as provided in Assembly Bill 32 and Senate Bill 32. The Plan does not recognize this authority in the scenario, nor does such authority exist in the misleading British Columbia example. The Board claims a carbon tax has "no mechanism to limit the actual amount of GHG emissions either at a single source or in the aggregate" (Plan at 50) but ignores the Board's statutory authority to institute those limits. In other words, if a carbon tax underperforms, the Board could adopt the additional measures such as those identified in the No Cap and Trade Scenario, including a more stringent Refinery Rule that achieves a thirty percent (or more) reduction.

166-3 cont.

Third, the Plan states that a carbon tax forgoes existing linkages with the current Cap and Trade program and questions whether a carbon tax would comply with the Clean Power Plan. Proposed Plan at 51. The alternatives analysis should not reject an alternative as infeasible simply because it would not link with one or more Canadian province's cap and trade systems. Linking with other jurisdictions and using Cap and Trade in the Clean Power Plan are not identified as project objectives (EA at 175-177), so rejecting an alternative on these grounds would not comport with CEQA. The Plan implies that other U.S. states in the Western Climate Initiative may adopt Cap and Trade programs, but that prospect has diminished to a near-zero probability with the 2016 Presidential election and the impending rescission of the Clean Power Plan. Finally, even if the Trump EPA retains the Clean Power Plan, the Clean Power Plan itself recognizes that a carbon tax would be a permissible state measures strategy, something the Draft fails to recognize. Proposed Plan at 51; 80 Fed. Reg. 64662, 64836 (Oct. 23, 2015).

Finally, the Draft's analysis reflects a pattern and practice at the Board of inadequate consideration of reasonable alternatives. The 2008 Scoping Plan failed to adequately analyze and consider a carbon tax when the Board opted to pursue Cap and Trade. As a result, the Superior Court held that the Board violated the California Environmental Quality Act. This Draft reflects the same bias

¹⁰ On March 28, 2017, President Trump signed an Executive Order calling for the repeal of the Clean Power Plan.

in favor of Cap and Trade. Instead of misrepresenting a carbon tax as a flawed strategy to bolster the problematic and inequitable Cap and Trade program, the Board should engage in a good faith and reasoned analysis of the benefits that a carbon tax offers.

The Environmental Analysis's evaluation of the carbon tax and cap and tax alternatives improperly finds that the alternative may not meet Objectives 1 and 2 (reduce emissions to meet the 2030 target). With respect to the carbon tax alternative, the EA states that "it is unclear if Alternative 3 would meet 2030 GHG emission reduction targets, because it would depend on market conditions and unforeseeable actions taken by covered entities." With respect to the cap and tax, the EA states "if other measures did not perform as expected, this alternative may not achieve the 2030 target as it would not scale across the industrial and energy sectors." As discussed above, the Board has the authority and duty to review the implementation of this scoping plan and adopt additional measures to ensure the 2030 target is achieved. Moreover, the Board also has the duty to prioritize direct emission reduction measures at stationary sources in the industrial and energy sectors under AB 197. The EA does not explain why the carbon tax or cap and tax alternatives – combined with this authority and duty – would not achieve Objectives 1 and 2. Furthermore, the EA questions both alternatives effectiveness at eliminating leakage in a short, conclusory fashion. The EA improperly dismisses Alternatives 3 and 5 because the EA and the Plan do not explain the factual bases for its conclusory statements and the rationale do not comport with the Board's authority and duty under AB 32, SB 32, and AB 197.

166-3 cont

Furthermore, the analysis fails to analyze whether the cap and tax alternative would be the environmentally superior alternative. As discussed in section IV, *infra*, the EA does not adequately analyze cap and trade air quality impacts. Alternative 5 does not allow offsets or allowance trading, and includes an emissions cap to drive down reductions. Accordingly, communities would not be denied the benefits of direct emissions reductions under cap and trade and would experience better air quality outcomes as compared to the Proposed Plan.

IV. The Environmental Analysis Fails to Adequately Consider and Analyze Air Quality Impacts from Cap and Trade.

Under CEQA, the Board has an obligation to identify, analyze, and mitigate the environmental impacts of the Proposed Plan. Cal. Code Regs., tit. 14, § 15252; Cal. Code Regs., tit. 17, § 60005(b); California Sportfishing Protection Alliance v. State Water Resources Control Board (2008) 160 Cal. App. 4th 1643-45 ("[w]hile the CEQA Guidelines do not directly apply to certified regulatory programs, the information disclosure provisions and broad policy goals of CEQA still apply.").

166-4

When considering the impacts of Cap and Trade on Air Quality, the Environmental Analysis (EA) devotes a cursory two-pages and concludes, without supporting evidence, that because "ARB has received so few years of reported data to date, ARB lacks sufficient information to conclude with

¹¹ Proposed Plan, Appendix F at 182, 184-185.

¹² Id. at 182.

¹³ Id. at 184.

¹⁴ The EA finds that Alternative 5 would meet all of the other project objectives, and does not find that there would be increased environmental impacts from implementing Alternative 5. Proposed Plan, Appendix F at 184-185.

certainty that localized emissions increases have not occurred." Proposed Plan, Appendix F at 66. Both the Plan and the EA neither discuss, disclose, or consider the Cushing Report or the OEHHA Report discussed in Section I.A, *supra*. While ARB may or may not have complete implementation data, it has a duty to undertake a good faith analysis and make that analysis available to the public to meaningfully consider the impact of Cap and Trade. ARB also has the duty to analyze the impact of Cap and Trade and mitigate impacts or adopt project alternatives. As the Cushing Report and the OEHHA Report demonstrate, greenhouse gas emissions have increased in some sectors and communities are denied health benefits from direct reductions because co-pollutant increases/decreases are directly correlated to changes in greenhouse gas emissions. This evidence, combined with the Plan's failure to institute AB 197 direct measures impermissibly in favor of Cap and Trade, means that this project will have an impact on air quality and public health. The Plan violates CEQA by failing to analyze and mitigate that impact.

166-4 cont.

V. Conclusion

We call on the Board to direct staff to amend the Proposed Plan to remove Cap and Trade as a strategy and to meaningfully incorporate the recommendations of the Environmental Justice Advisory Committee. Furthermore, the Board should support the EJAC's Declaration calling for carbon pricing reform by prioritizing direct emissions reductions and replacing Cap and Trade with a direct carbon pricing system.¹⁵

We look forward to a revised Proposed Plan and a climate policy that places environmental justice at its core. Thank you for your time and courtesy.

Sincerely,

Brent Newell

Center on Race, Poverty & the Environment

Amy Vanderwarker California Environmental Justice Alliance

Mari Rose Taruc
AB 32 Environmental Justice Advisory Committee, Leadership Team

AB 32 Environmental Justice Advisory Committee, Leadership Team

¹⁵ See The California Environmental Justice Advisory Committee's Declaration in Support of Carbon Pricing Reform in California, attached as Exhibit 5.

Phoebe Seaton

Leadership Counsel for Justice & Accountability

Martha Dina Argüello

Physicians for Social Responsibility - Los Angeles

Tom Frantz

Association of Irritated Residents

Tony Sirna

Californians for a Carbon Tax

lauren Ornelas

Food Empowerment Project

Todd Shuman

Wasteful Unreasonable Methane Uprising

Ara Marderosian

Sequoia ForestKeeper

Jan Dietrick

Ventura County Climate Hub

Colin Bailey

The Environmental Justice Coalition for Water

Exhibit 1

RESEARCH BRIEF - SEPTEMBER 2016





A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP-AND-TRADE PROGRAM

By Lara J. Cushing^{1,5} Madeline Wander⁴ Rachel Morello-Frosch^{1,2} Manuel Pastor⁴ Allen Zhu³ James Sadd⁶

University of California, Berkeley

- ¹ Department of Environmental Science, Policy, and Management
- ²School of Public Health
- ³School of Engineering
- ⁴University of Southern California, Program for Environmental and Regional Equity (PERE)
- ⁵San Francisco State University, Department of Health Education
- ⁶Occidental College, Department of Geology







OVERVIEW

California's cap-and-trade program is a key strategy for achieving reductions in greenhouse gas (GHG) emissions under AB32, the California Global Warming Solutions Act. For residents living near large industrial facilities, AB32 offered the possibility that along with reductions in GHGs, emissions of other harmful pollutants would also be decreased in their neighborhoods. Carbon dioxide (CO₂), the primary GHG, indirectly impacts health by causing climate change but is not directly harmful to health in the communities where it is emitted. However, GHG emissions are usually accompanied by releases of other pollutants such as particulate matter (PM₁₀) and air toxics that can directly harm the health of nearby residents.

In this brief, we assess inequalities in the location of GHG-emitting facilities and in the amount of GHGs and PM₁₀ emitted by facilities regulated under cap-and-trade. We also provide a preliminary evaluation of changes in localized GHG emissions from large point sources since the advent of the program in 2013. To do this, we combined pollutant emissions data from California's mandatory GHG and criteria pollutant reporting systems, ^{1,2} data on neighborhood demographics from the American Community Survey, cumulative environmental health impacts from the California Environmental Protection Agency's CalEnviroScreen tool, and information from the California Air Resources Board (CARB) about how regulated companies fulfilled their obligations under the first compliance period (2013-14) of the cap-and-trade program. Our methodology is described in greater detail in the appendix to this report.

In this analysis, we focus primarily on what are called "emitter covered emissions," which correspond to localized, in-state emissions (derived mostly from fossil fuels) from industries that are subject to regulation under cap-and-trade. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes).

We found that regulated GHG-emitting facilities are located in neighborhoods with higher proportions of residents of color and residents living in poverty. In addition, facilities that emit the highest levels of both GHGs and PM₁₀ are also more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity cobenefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged communities. In terms of GHG emission trends, in-state emissions have increased on average for several industry sectors since the advent of the cap-and-trade program, with many high emitting companies using offset projects located outside of California to meet their compliance obligations. Enhanced data collection and availability can strengthen efforts to track future changes in GHG and co-pollutant emissions and inform decision making in ways that incentivize deeper in-state reductions in GHGs and better maximize public health benefits and environmental equity goals.

FINDINGS

1. Facilities that emit localized GHGs are located in more disadvantaged communities.

On average, neighborhoods with a facility that emitted localized GHGs within 2.5 miles³ have a 22 percent higher proportion of residents of color and 21 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility. Neighborhoods within 2.5 miles of a facility are also more than twice as likely to be among the worst statewide in terms of their CalEnviroScreen score, a relative ranking of cumulative impact based on indicators of social and environmental stressors to health (Table 1⁴).

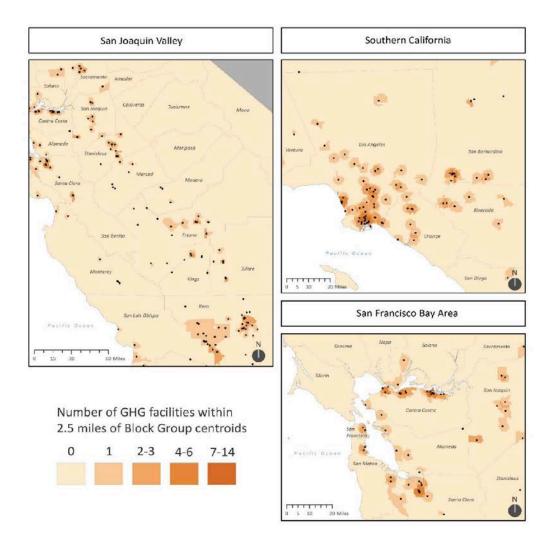
TABLE 1 Characteristics of Neighborhoods within 2.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 2.5 miles (N=6,397)	Block groups with no facilities within 2.5 miles (N=16,705)
Mean % People of Color	66%	54%
Mean % People Living Below Twice the Poverty Level	41%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	17%	7%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	31%	15%

2. Many of California's residential communities are within 2.5 miles of more than one GHG-emitting facility (Figure 15).

These communities are home to a higher proportion of residents of color and people living in poverty than communities with no or few facilities nearby. Indeed, the higher the number of proximate facilities, the larger the share of low-income residents and residents of color (Figure 2).

FIGURE 1
Residential Proximity to Facilities Reporting Emitter Covered GHG Emissions during the 2013-14
Compliance Period (N=321 facilities)



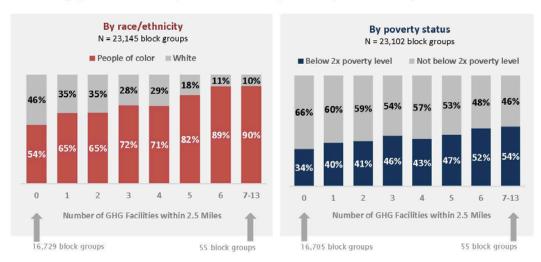
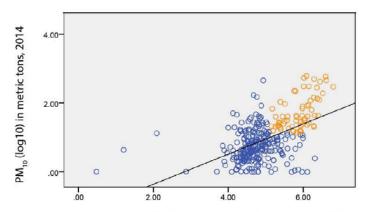


FIGURE 2
Demographics in Block Groups near GHG-emitting Facilities (N=255 facilities)

3. While GHG emissions do not generally have direct health impacts, co-pollutants such as particulate matter (PM₁₀) do. Such emissions are correlated (Figure 3°), with large GHG emitters reporting that they emit more particulate matter. The largest emitters of both GHGs and PM₁₀ also tend to be located near neighborhoods with higher proportions of disadvantaged residents (Table 2').

The neighborhoods within 2.5 miles of the 66 largest GHG and PM₁₀ emitters (defined as the top third in emissions of both PM₁₀ and GHGs and highlighted in orange in Figure 3) have a 16 percent higher proportion of residents of color and 11 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility (Table 2). Compared to other parts of the state, nearly twice as many neighborhoods within 2.5 miles of these highest-emitting facilities are also among the worst statewide in terms of their CalEnviroScreen score. We also found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6 in the Appendix).

FIGURE 3
Correlation between Emitter Covered GHG Emissions and Particulate Matter (N=317 facilities)



Emitter Covered GHG Emissions (log10) in metric tons, 2014

TABLE 2 Characteristics of Neighborhoods within 2.5 miles of the top GHG- and PM_{10} - Emitting Facilities (N=66 facilities)

	Block groups within 2.5 miles of the largest GHG and PM ₁₀ emitters (N=1,290)	All other block groups (N=21,812)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	40%	36%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	18%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	35%	19%

4. While overall, GHG emissions in California have continued to drop from a peak in 2001, we find that, on average, many industry sectors covered under cap-and-trade report increases in localized in-state GHG emissions since the program came into effect in 2013.8

Only a portion of the state's total GHG emissions are regulated under the cap-and-trade system. For example, the industrial and electrical sectors accounted for about 41 percent of the state's estimated total GHGs emissions in 2014. (The remainder originated from sectors such as transportation, commercial and residential buildings, and agriculture.) As a result, overall emissions and emissions regulated under cap-and-trade can exhibit slightly different patterns. Moreover, not all emissions regulated under the cap-and-trade program occur in-state. For example, according to CARB's 2016 Edition of the California GHG Emission Inventory, emissions from electrical power decreased by 1.6 percent between 2013 and 2014. However, when these emissions are disaggregated, we see that it is the emissions associated with imported electricity that decreased, while emissions from in-state electrical power generation actually increased.

Figure 4 shows the distribution of the change in localized GHG emissions regulated under cap-and-trade for two time periods: the two years prior and the two years after the program came into effect. We present the range in emissions changes reported by individual facilities within seven industry sectors for 2013-14 versus 2011-12; this includes the median (50th percentile), mean (average), and 10th to 90th percentile of changes in emitter covered emissions for 314 GHG facilities. For example, six of the nine cement plants included in Figure 4 reported increases in emissions during 2013-14 relative to 2011-12. The median value corresponds to the 143,295-ton increase reported by the cement plant in the middle of the distribution (5th highest emitting facility out of the nine total). Similarly, the 25th and 75th percentiles correspond to the increases reported by the 3th highest emitting facilities. The facilities with the minimum and maximum emissions changes are not shown in this graph to make it more legible; for example, the Cemex Victorville cement plant reported an increase of over 843,000 tons, an amount that far exceeds the range portrayed in Figure 4.

FIGURE 4
Change in Emitter Covered GHG Emissions by Industry Sector (N=314 facilities)

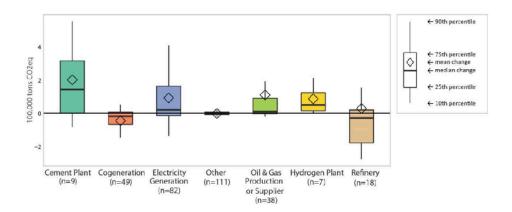
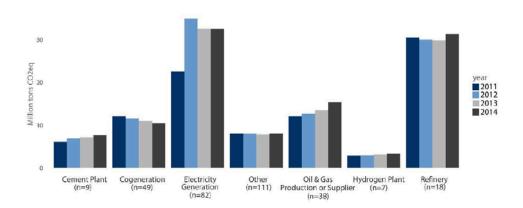


Figure 5 shows temporal trends in total emitter covered emissions (the sum of emissions from all individual facilities) by industry sector for 2011-2014. The number of facilities can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report GHG emissions to CARB. In both Figure 4 and Figure 5, we included only those facilities that: 1) report to the inventory every year during the four-year period, and 2) report at least some emitter covered emissions during those same four years. Again, the upward trend in several sectors is notable.

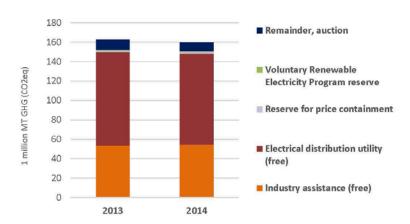
FIGURE 5
Temporal Changes in Total Emitter Covered GHG Emissions by Industry Sector



5. Between 2013 and 2014, more emissions "offset" credits were used than the total reduction in allowable GHG emissions (the "cap"). These offsets were primarily linked to projects outside of California, and large emitters of GHGs were more likely to use offset credits to meet their obligations under cap-and-trade.

The cap-and-trade program requires regulated companies to surrender one compliance instrument—in the form of an allowance or offset credit—for every ton of qualifying GHGs they emit during each compliance period. These instruments are bought and sold on the carbon market. The total number of allowances is set by the "cap," which decreases by roughly 3 percent per year in order to meet GHG reduction targets. In 2013 and 2014, most allowances were given to companies for free for leakage prevention, for transition assistance, and on behalf of ratepayers (Figure 6). Additional offset credits were generated from projects that ostensibly reduce GHGs in ways that may cost less than making changes at a regulated facility.

FIGURE 6
Allocation of Allowances



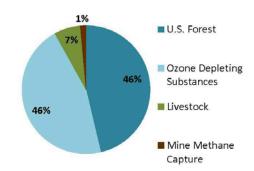
Regulated companies are allowed to "pay" for up to 8 percent of their GHG emissions using such offset credits. The majority of the offset credits (76 percent) used to date were generated by out-of-state projects (Figure 7). Figure 8 shows that most offset credits were generated from projects related to forestry (46 percent) of and the destruction of ozone-depleting substances (46 percent). Furthermore, over 15 percent of offset credits used during the first compliance period were generated by projects undertaken before final regulations for the cap-and-trade program were issued in 2011, calling into question whether these GHG reductions can be attributed to California's program, or whether they might have happened anyway.

FIGURE 7 Origin of Offset Credits

24%

California
Ohio
Michigan
New Hampshire
South Carolina
Other

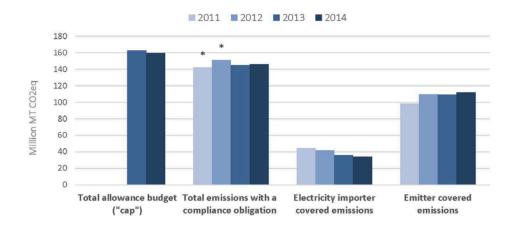
FIGURE 8
Offset Credits by Project Type



During the first compliance period of 2013-14, the total emissions that were subject to a compliance obligation (the second set of columns in Figure 9) were lower than the cap set by the allowance budget (left-most set of columns in Figure 9). This total includes both the emitter covered emissions that have been the focus of our analysis so far (right-most set of columns in Figure 9) and out-of-state emissions associated with imported electricity (which went down every year during the four-year period as shown by the third set of columns in Figure 9). Offset credits worth more than 12 million tons of CO_{2n} were utilized to meet these obligations. These offsets represent 4.4 percent of the total compliance obligation of all regulated companies and over four times the targeted reduction in GHG emissions from 2013 to 2014 as established by the cap (Figure 10).

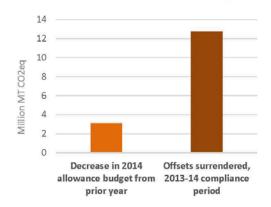
We found that the majority of companies did not use offset credits to meet their compliance obligation; however, those companies that *did* use offsets tended to have larger quantities of GHG emissions. The top 10 users of offsets account for 36 percent of the total covered emissions and 65 percent of the offsets used. These top offset users included Chevron (1.66 million offsets), Calpine Energy Services (1.55 million offsets), Tesoro (1.39 million offsets), SoCal Edison (1.04 million offsets), Shell (0.62 million offsets), PG&E (0.44 million offsets), Valero (0.43 million offsets), La Paloma Generating Company (0.40 million offsets), San Diego Gas & Electric (0.39 million offsets), and NRG Power (0.33 million offsets).

FIGURE 9 Total GHG Budget



^{*} Only emissions during 2013 and 2014 were subject to a compliance obligation. Estimates of comparable emissions during 2011 and 2012 were derived by summing the 'emitter covered' and 'electricity importer covered' emissions reported by regulated facilities for those years.

FIGURE 10
Offset Credits vs. Decrease in Allowance Cap



CONCLUSIONS

California's efforts to slow climate change by reducing GHG emissions can bring about additional significant co-benefits to health, particularly in disadvantaged communities. Preliminary analysis of the equity implications of California's cap-and-trade program indicates that regulated GHG-emitting facilities tend to be located in neighborhoods with higher proportions of residents of color and residents living in poverty. There is a correlation between emissions of GHGs and PM₁₀, and facilities that emit the highest levels of both GHGs and PM₁₀ are similarly more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity co-benefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged

Currently, there is little in the design of cap-and-trade to ensure this set of localized results. Indeed, while the cap-and-trade program has been in effect for a relatively short time period, preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were linked to offset projects located outside of California. Large GHG emitters that might be of most public health concern were the most likely to use offset projects to meet their obligations under the cap-and-trade program.

Further research is needed before firm policy conclusions can be drawn from this preliminary analysis. As regulated industries adapt to future reductions in the emissions cap, California is likely to see more reductions in localized GHG and co-pollutant emissions. Thus far, the state has achieved overall emissions reductions in large part by using offsets and replacing more GHG-intensive imported electricity with cleaner, in-state generation. Steeper in-state GHG reductions can be expected going forward if the use of offsets were to be restricted and the opportunity to reduce emissions by replacing imported electricity with in-state generation becomes exhausted.

However, ongoing evaluation of temporal and spatial trends in emissions reductions will be critical to assessing the impact of the cap-and-trade program. Several recommendations would strengthen future analyses and facilitate better tracking of the public health and environmental equity aspects of the cap-and-trade program going forward.

These include:

- Building better linkages between state facility-level databases on GHG and co-pollutant emissions.
 To conduct this preliminary analysis, we had to do a series of matches between datasets with different facility ID codes (see Appendix for details). Harmonization of facility ID codes between relevant data sources could be built into facility emissions reporting requirements going forward in order to facilitate analysis of temporal and spatial GHG and co-pollutant emissions trends.
- Publicly releasing data on facility- and company-specific allowance allocations.
- Tracking and making data available on facility- and company-specific allowance trading patterns.

Good quality, publicly accessible data and robust analysis will be critical to informing policy discussions and improving regulatory implementation of California's climate law in ways that incentivize deeper instate GHG reductions and that achieve both sustainability and environmental equity goals.

ACKNOWLEDGEMENTS

We thank USC PERE Data Manager Justin Scoggins, Graduate Research Assistant Melody Ng, and Communications Specialist Gladys Malibiran for their assistance in the production of this brief; the California Environmental Justice Alliance for helpful feedback on an early version of this brief; and the Energy Foundation (grant number G-1507-23494), the Institute for New Economic Thinking (grant number INO1500008), and the Resource Legacy Fund for their support of this work.

Cover image credits:

Creative Commons licensed (CC BY 2.0) via Flickr.com - by haymarketrebel - https://flic.kr/p/9mnYHQ
Creative Commons licensed (CC BY 2.0) via Flickr.com - by Sharon Rong - https://flic.kr/p/nAnQ2

APPENDIX

This appendix includes a description of the methods used in our preliminary environmental equity assessment of California's cap-and-trade program. We also present supplemental analyses, including a comparison of neighborhood demographics near regulated GHG facilities using different buffer distances to define proximity.

Methods

GREENHOUSE GAS EMISSIONS

To start, we downloaded annual, facility-specific GHG emissions data for 2011-2014 from the Mandatory Reporting of Greenhouse Gas Emissions (MRR) program. The MRR includes self-reported estimates of annual emissions of greenhouse gases (GHGs)—carbon dioxide (CO2), methane (CH2), nitrous oxide (N2O), and fluorinated GHGs-from regulated industries that have been verified by an independent third party. Emissions are given in units of CO₂-equivalents, a metric that combines the quantity of individual gases emitted with the potency of each gas in terms of its contribution to climate change over a 100-year time frame (also known as "global warming potential"). Our analysis focused on one class of emissions included in this database called "emitter covered emissions," which corresponds to localized, in-state emissions resulting from "the combustion of fossil fuels, chemical and physical processes, vented emissions... and emissions from suppliers of carbon dioxide"11 as well as emissions of GHGs other than CO2 from biogenic fuel combustion. The term "covered" refers to the fact that these emissions are subject to a compliance obligation under the cap-and-trade program; releases of CO2 that result from the combustion of biogenic fuels, for example, are exempted. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes); although we did not analyze distributed emissions in this report, this category of emissions will be a future research topic.

The number of facilities reporting to the MRR can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report. In our analysis of trends in emissions across industry sectors, we excluded facilities that did not report to the emissions inventory every year during 2011-14, as well as facilities that reported no emitter covered emissions during the four-year period. Facilities were categorized according to the sector reported in the MRR with slight modifications to reduce the number of categories. Facilities described as a refinery alone or in combination with any of the following were categorized as a refinery: hydrogen plant, CO₂ supplier, or transportation fuel supplier. Facilities described as "other combustion source" or "other combustion sou

We determined or confirmed the geographic location of each facility using a variety of data sources and methods. Geographic point locations for some facilities were obtained directly from the California Air Resources Board (CARB), and facility addresses reported in CARB's online GHG visualization tool were geocoded. ¹² We located some sites using individual internet searches. All locations inside California were visually confirmed, and point locations were adjusted for accuracy using aerial imagery in Google Earth Pro.

CO-POLLUTANT DATA (PM10)

We obtained emissions of criteria air pollutants from the California Emission Inventory Development and Reporting Systems (CEIDARS) database for years 2011-14.² Reporting requirements, including the way in which facilities are defined, the numeric identifier attached to each facility, and the frequency of reporting, differ between CEIDARS and the MRR GHG database. This presents a challenge for combining emissions estimates from the two sources. In particular, criteria air pollutants are not required to be reported annually, and emissions estimates contained in the 2014 CEIDARS database may correspond to estimates from prior years. We joined data on PM₁₀ emissions from the 2014 CEIDARS with GHG emissions information from the MRR GHG database based on the facility name, city, and ZIP code. For some GHG facilities listed in the MRR GHG database, we obtained addresses from CARB's Facility GHG Emissions Visualization and Analysis Tool. ¹² Since the CEIDARS database also contains addresses, we were able to use the address field to confirm and find additional matches. When all variables (facility name, city, and ZIP code) did not match between the two data sources, matches were confirmed by hand through internet searches of company websites and online databases containing facility names and addresses.

NEIGHBORHOOD DEMOGRAPHICS AND CUMULATIVE IMPACT

We defined neighborhoods on the basis of 2010 vintage Census block group boundaries provided by the U.S. Census. ¹³ Block group centroids were created by using the point-to-polygon tool in ArcGIS and the distance between block group centroids and GHG facility locations was calculated using the point-distance tool in ArcGIS (ESRI, Redlands, CA).

Demographic information for each block group was obtained from the 2014 5-year American Community Survey estimates. White individuals were defined as those who self-identified as white but not Hispanic. People of color were defined as all other individuals, including those who identified as multiracial or of Hispanic ethnicity. Poverty was defined as twice the federal poverty level (FPL) to reflect increases in the cost of living since the FPL was established and California's high cost of living.

CalEnviroScreen is a state-level screening tool developed by the California Environmental Protection Agency that helps identify California communities that are disproportionately burdened by multiple sources of pollution.[™] It includes indicators of proximity to environmental hazards and population vulnerability to derive a relative score of cumulative environmental health impact. We assigned block groups the most recent CalEnviroScreen score of their census tract in order to compare CalEnviroScreen rankings near GHG facilities to the rest of the state. Figure 11 summarizes the construction of our facility-level dataset.

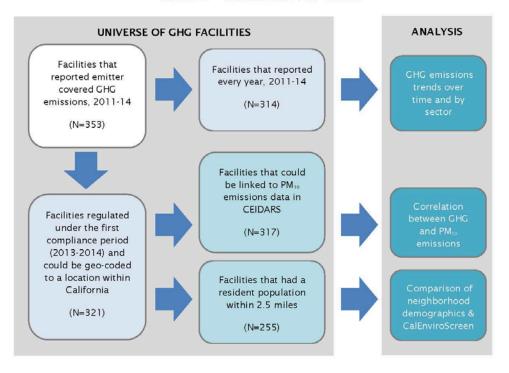


FIGURE 11 - Construction of the Dataset

ALLOWANCES AND OFFSETS

Unlike the emissions data, information on the allocation of allowances and ways in which regulated industries are complying with the cap-and-trade program is reported on an industry- and company-specific basis, rather than at the facility level. One company may own several regulated facilities. Information on the allocation of allowances was compiled from the California Code of Regulations (17 CA ADC § 95841 and 17 CCR § 95870) and CARB publications on the public allocation of allowances and estimates of state-owned allowances. We obtained the number of allowances and offsets surrendered by each company at the completion of the first compliance period from CARB's 2013-14 Compliance Report. Information on individual offset projects was compiled from CARB documents on offsets issued as of August 10, 2016 ¹⁷ and individual project descriptions provided in the American Carbon Registry and Climate Action Reserve carbon offset registries. ¹⁹

Supplemental Analyses

Consistent with the findings presented in Table 1 in the main text, Table 3 shows that neighborhoods within 1.5 miles of a facility with localized GHG emissions have a 16 percent higher proportion of residents of color, a 26 percent higher proportion of residents living in poverty, and a higher likelihood of scoring among the worst statewide in terms of their CalEnviroScreen score than neighborhoods that are not within 1.5 miles of such a facility. Table 4 and Table 5 show similar trends when neighborhoods up to a larger distance of 3.5 and 6 miles away are considered. These results confirm that the findings presented in our main analysis were not sensitive to our choice of buffer distance.

TABLE 3
Characteristics of Neighborhoods within 1.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 1.5 miles (N=2,710)	Block groups with no facilities within 1.5 miles (N=20,392)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	44%	35%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	20%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	36%	18%

TABLE 4
Characteristics of Neighborhoods within 3.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 3.5 miles (N=9,991)	Block groups with no facilities within 3.5 miles (N=13,111)
Mean % People of Color	66%	51%
Mean % People Living Below Twice the Poverty Level	39%	33%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	15%	6%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	29%	13%

TABLE 5
Characteristics of Neighborhoods within 6 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 6 miles (N=16,365)	Block groups with no facilities within 6 miles (N=6,737)
Mean % People of Color	65%	41%
Mean % People Living Below Twice the Poverty Level	37%	32%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	13%	3%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	25%	7%

In the main text, we defined the 66 largest GHG and PM_{10} emitting facilities as those that were within the top third in terms of their 2014 emissions of both PM_{10} and localized GHGs, and highlighted them in orange in Figure 2. We found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6).

TABLE 6
Characteristics of Neighborhoods near top GHG- and PM₁₀-Emitting Facilities that Increased and Decreased GHG Emissions (N=66 facilities ¹⁹)

	Block groups within 2.5 miles of at least one top emitting facility that increased GHG emissions (N=675)	Block groups within 2.5 miles of at least one top emitting facility that decreased GHG emission: (N=669)
Mean % People of Color	74%	58%
Mean % People Living Below Twice the Poverty Level	46%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	25%	14%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	46%	28%

ENDNOTES

- ¹ Mandatory Reporting of Greenhouse Gas Emissions (MRR), http://www.arb.ca.gov/cc/reporting/ghg-rep/reporteddata/ghg-reports.htm.

 2 CEIDARS, http://www.arb.ca.gov/ei/disclaim.htm; http://www.arb.ca.gov/ei/drei/maintain/dbstruct.htm.
- GHG facilities were limited to those that report emitter covered emissions during the first compliance period of capand-trade (2013-14), could be geo-coded in California, and had a resident population within 2.5 miles (N=255). We define neighborhoods using Census block groups. Residential proximity to a GHG facility was based on the distance between the facility location and each block group's centroid. We chose a 2.5 mile distance due to its common use in other environmental justice analyses. The Appendix gives results using alternative distance buffers.
- for all four measures shown. However, the results were the same when we included all block groups with valid data for each measure on an individual basis.
- The map in Figure 1 shows 66 additional facilities that are not included in Table 1 and Figure 2 because they are not within 2.5 miles of a block group centroid with a resident population. See Figure 11 in the Appendix for details
- **Because there are several PM₁₀ values that are between zero and one metric ton, in Figure 3 we added 1 to the PM₁₀ value for all facilities prior to taking the log10 to avoid reporting negative values.

 **Similar to Table 1, for calculations in Table 2, we used the universe of block groups for which there are valid data (i.e., non-missing data) for all four measures shown. However, the results were the same when we include all block groups
- with valid data for each measure on an individual basis.

 The results were qualitatively similar when we compared 2014 emissions to 2012 emissions. That is, the median and mean for each industry sector were in the same direction as shown in Figure 4 (above, near, or below zero), with onmajor exception: electricity generators on average decreased their emitter covered emissions in 2014 relative to 2012. California GHG Emission Inventory, 2016 Edition,

http://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

Some have critiqued the appropriateness of forestry projects for carbon offset purposes. For example, tree planting projects can take decades to reach maturity in terms of their ability to sequester carbon. Younger trees sequester less carbon and often take decades to fully mature. Moreover, it is challenging to measure and quantify the ability of forestry projects to sequester carbon over time. In particular, the permanence of forestry projects cannot be guaranteed as they remain susceptible to fire, disease, natural decay, clearing, or mismanagement. Forestry projects are also vulnerable to "leakage." This refers to the fact that, unless global demand for wood products goes down, a reduction in logging in one location can simply result in greater deforestation in another location.

(See http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=0 and

http://www.web.uvic.ca/~repa/publications/REPA%20working%20papers/WorkingPaper2007-02.pdf for overviews of these issues.)

- https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2014-ghg-emissions-2015-11-04.xlsx http://www.arb.ca.gov/ei/tools/ghg_visualization/
- https://www.census.gov/geo/maps-data/data/cbf/cbf_blkgrp.html
- http://www.arb.ca.gov/calenviroscreen/report/calenviroscreen-version-20
 http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/publicallocation.htm;
- http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-ng-allowancedistribution/electricity-allocation.pdf;

http://www.arb.ca.gov/cc/capandtrade/stateauction.htm

http://www.arb.ca.gov/cc/capandtrade/2013-2014compliancereport.xlsx

http://www.arb.ca.gov/cc/capandtrade/offsets/issuance/arb_offset_credit_issuance_table.pdf

- 18 http://americancarbonregistry.org; http://www.climateactionreserve.org
- 19 66 GHG facilities fell in the top third in terms of both PM₁₀ and localized GHG emissions. We found that 40 of these facilities increased localized GHG emissions, 23 decreased emissions, and three did not report to the database all four years (2011-2014) so we could not determine an increase or decrease

Exhibit 2

Bulletin of the **Atomic**

IT IS 5 MINUTES TO MIDNIGHT



Feature

How California's carbon market actually works

2014, Vol. 70(5) 35-44 © The Author(s) 2014 Reprints and permissions: sagepub.co.uk/journalsPermissions.nav DOI: 10.1177/0096340214546834 http://thebulletin.sagepub.com

(S)SAGE

Danny Cullenward

Abstract

Almost 10 years ago, California's legislature passed Assembly Bill 32, the Global Warming Solutions Act of 2006. AB 32 set the most ambitious legally binding climate policy in the United States, requiring that California's greenhouse gas emissions return to 1990 levels by the year 2020. The centerpiece of the state's efforts—in $rhetorical\ terms, if\ not\ practical\ ones - is\ a\ comprehensive\ carbon\ market,\ which\ California's\ leaders\ promote$ as a model policy for controlling carbon pollution. Over the course of the past 18 months, however, California quietly changed its approach to a critical rule affecting the carbon market's integrity. Under the new rule, utilities are rewarded for swapping contracts on the Western electricity grid, without actually reducing greenhouse gas emissions to the atmosphere. Now that the Environmental Protection Agency is preparing to regulate greenhouse gases from power plants, many are looking to the Golden State for best climate policy practices. On that score, California's experience offers cautionary insights into the challenges of using carbon markets to reduce greenhouse gas emissions.

Keywords

California, cap-and-trade, carbon market, climate policy, emissions, leakage, resource shuffling

or years, Southern California Edison imported electricity from the Four Corners Power Plant, a coal-fired facility in northwestern New Mexico. When California's groundbreaking carbon market took effect in 2013, Edison, like all other in-state utilities, became responsible for the climate pollution from its generating fleet. A few months later, the company sold its interest in the coal plant to an Arizona utility (APS, 2013). Whatever replacement supplies Edison selects will be cleaner than coal, the most carbonintensive fossil fuel, and Edison will according to state officials, is a

report reduced emissions in California's carbon market.

At first this sounds like a positive story: Policy puts price on carbon, pollution falls. But this transaction will not reduce net greenhouse gas emissions to the atmosphere. The coal plant will keep emitting pollution just as before—only now it serves customers in Arizona, not California.

As it has with many other environmental issues before, California aims to set an example for the United States on climate policy. The key to its success,

Downloaded from bos.sagepub.com at UNIV CALIFORNIA BERKELEY LIB on September 3, 2014

carbon comprehensive market-featuring "good policy design, clear oversight and strong enforcement" (Nichols, 2014). Ironically, one of the most visible consequences of the market's first year is a rush to swap coal power imports for cleaner replacements, limiting the extent to which California's policy leadership actually helps the climate. Is this perverse outcome the unavoidable consequence of California acting without its neighbors' support, or could the state have done more to ensure that its market creates real environmental benefits?

An efficient theory

The slow birth of American climate policy coincides with a transition in the way our country manages its environmental problems. Most of our national environmental laws were drafted at a time when both political parties supported government regulation of the private sector. That was, of course, a different era. Since then, the center of national political opinion has shifted dramatically in favor of the free market. And that trend is visible in contemporary environmental policy, which, over the last few decades, has moved away from traditional regulatory approaches to controlling pollution. Flexible, market-based mechanisms are now the preferred route.

The thinking goes something like this: Rather than impose specific requirements on individual companies or industries, it is more efficient for the government to set economy-wide policy targets and let the private sector find the cheapest way to meet them. In theory, this not only increases the flexibility of regulated industries' compliance options but also reduces the policy's

administrative complexity. Thus, if done right, economic approaches to environmental policy should result in a win-win.

Enter a uniquely American invention, the carbon market—also known as emissions trading or cap-and-trade. The idea is simple, though the practice is not. Economic theory says that all a government needs to do is: set a quantitative cap on emissions; create and freely distribute or auction emissions permits, with the total number of permits equal to the cap; and require polluters to turn in a permit for each unit of pollution they emit. With this framework in place, the government steps back to let the private sector do what it does best: trade permits to minimize costs.

The most critical component of a carbon market is the cap. Typically, the cap is expressed as a maximum quantity of emissions allowed in any given year, with each year's limit declining toward a long-term goal. Think of it like a game of musical chairs—with carbon pollution as the players, and the chairs representing emissions permits. At the end of every year, the music stops and the players must seat themselves. When there are more people than chairs, market forces dictate who leaves the game and who can stay; the government's role in this analogy is only to set up the rules and remove the correct number of chairs at each stage. So long as the government counts the right number of chairs, everything should work out fine.

California's climate policy

After the United States withdrew from the Kyoto Protocol and elected George W. Bush, whose administration strongly opposed legally binding federal climate Cullenward 37

policy, momentum shifted to the states. California moved to claim its traditional role as an environmental policy leader by passing AB 32, the Global Warming Solutions Act of 2006. Most notably, this bill requires California's emissions to fall to 1990 levels by the year 2020. AB 32 also designated a primary regulator, the California Air Resources Board (CARB), making CARB responsible for developing specific policies and measures that would lead California to its 2020 target.

The key to understanding California's climate policy system lies in recognizing the overlapping structure of the instruments that CARB and other agencies eventually adopted. Arguably the state's best-known climate policy is its comprehensive carbon market, which CARB designed and implements. At the same time, California has a number of robust regulatory programs that apply to sectors that are also covered by the carbon market. For example, California has one of the strongest renewable portfolio standards (requiring utilities to purchase 33 percent of their electricity from renewable sources by 2020), as well as world-class energy efficiency programs and a clean transportation fuels policy.

Climate experts refer to these programs as "complementary policies"—a phrasing that suggests they exist to support the primary instrument, a carbon market. In practice, however, the complementary policies do most of the work. When CARB created its plan for meeting California's 2020 emissions target, it relied on complementary policies for approximately 80 percent of the reductions, leaving a mere 20 percent to "additional reductions" in the sectors covered by the state carbon market (CARB, 2008)—meaning that most of the reductions emissions are

accomplished by individual policies, not driven by the comprehensive market price on carbon. As my colleague Michael Wara (2014) explains elsewhere in this issue, the complementary policies effectively hide the true cost of California's climate policy: Because most of the necessary emissions reductions are required by separate regulation, rather than left to the carbon market, the carbon price reflects only a fraction of the state's climate policy efforts.²

California's market design

California benefits from the experience of the emissions trading systems that came before it. By carefully observing the early years of the European Union's Emissions Trading Scheme (ETS), for example, CARB was able to avoid many of the hiccups that confronted its predecessors. These successes are all the more laudable because California has implemented the most comprehensive market to date. While the northeastern states' Regional Greenhouse Gas Initiative controls only emissions from power plants, California's market currently covers the power and industrial sectors (as does the European ETS), and will expand next year to include the transportation fuels and natural gas sectors. All told, this will encompass about 85 percent of the state's total emissions—a comprehensive policy by any standard.

on the other hand, California faces many new challenges that previous markets never had to address. In particular, the state must contend with the fact that it is only a small part of a regional electricity transmission grid stretching from the Pacific Ocean to the Rocky Mountains. The scale of the Western grid being matters because California is a

significant net importer of electricity. Recognizing that the emissions profile of its electricity imports is part of California's carbon footprint, regulators rightly included electricity imports in the cap-and-trade program. But geography introduced new headaches. Because California is the only western state that prices its greenhouse gas emissions, utilities and power traders now face an incentive to swap their highemitting imports for cleaner replacements—a practice known as resource shuffling. (Recall the earlier example of Southern California Edison divesting its interest in a New Mexico-based coal power plant: Emissions reported in California go down, but emissions across the western United States do not change.)

If utilities are allowed to shuffle electric power imports, the emissions reductions they report in California's carbon market will not reflect reduced emissions to the atmosphere. Instead, the dirty resources California utilities divest will continue polluting the air under new, unregulated ownership. Given this dilemma, what should carbon market regulators do?³

A quiet coup

As it happens, the California Legislature anticipated these concerns. When the legislature delegated broad authority to CARB to create climate policy, it also issued guidelines that the regulator must incorporate in its policies. Specifically, state law requires that "to the extent feasible," climate regulations must "minimize leakage." California law defines leakage as "a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state."

In plain English, this requirement means that CARB should not give credit to actions that merely shift the responsibility for greenhouse gas emissions beyond state borders. Instead, AB 32 dictates that CARB should only recognize net reductions in emissions to the atmosphere. For a time, CARB followed this instruction. Its initial carbon market regulations banned resource shuffling, and went so far as to require companies' executives to attest that they were not engaged in this practice.⁶

But this approach proved controversial. In the months leading up to the beginning of the market's first compliance period, several stakeholders objected to the resource shuffling rules and began agitating for reforms. The first public proposal came from California's investor-owned utilities, which in September 2012 advocated a series of exemptions to the prohibition on resource shuffling (Joint Utilities Group, 2012). The following month, CARB directed its staff to develop modifications to the resource shuffling regulations, providing 13 fully developed "safe harbor" exemptions to the definition of resource shuffling (CARB, 2012a)—directly comparable to, if not more permissive than, the Joint Utilities Group proposal. A few weeks later, CARB staff released a new regulatory guidance document that incorporated these safe harbors, almost word for word (CARB, 2012b).

When a regulator issues a guidance document that publicly describes how to interpret its rules, that description provides a legal defense to any private party that reasonably relies upon it. After all, it would be extremely unfair if following the regulator's own advice could get one in legal trouble. But consider what this meant for the carbon

Cullenward 39

market. On the eve of the program's launch in January 2013, the regulator quietly rewrote its own rules through informal guidance documents. Formally, its regulations prohibited resource shuffling. Yet CARB's own guidance document indicated that this straightforward prohibition would not apply to 13 broad categories of transactions. Thus, when the market began operation in 2013, its practical function had already diverged from its formal legal rules.

The market springs a leak

My colleague David Weiskopf and I had been studying CARB's resource shuffling rules during this tumultuous time. We recognized that CARB faced an incredibly difficult task in writing effective and legally permissible cross-border accounting rules, yet we were surprised at the scope of CARB's informal guidance document. We believed that a compromise was possible, to give utilities clear and flexible rules without undermining the environmental integrity of the market.

Meanwhile, we were deeply concerned that the informal guidance document effectively revoked the prohibition on resource shuffling. We published our analysis of the safe harbors and the leakage risks they created in July 2013 (Cullenward and Weiskopf, 2013). Most important, we described how several of the safe harbors were broader than the underlying prohibition. In addition, we pointed out that two safe harbors explicitly allowed California utilities to divest their long-term contracts with out-of-state coal power plants.

As it happens, these coal power imports account for a significant portion of California's emissions. We calculated that if California utilities relied on the

safe harbors to divest from just six coal power plants, they could cause between 108 and 187 million tons of carbon dioxide to leak out of California's market-a quantity that is roughly equivalent to the expected size of the market, after accounting for the likely impact of the complementary policies. Furthermore, we realized that our analysis was consistent with calculations from CARB's own economic advisory committee, called EMAC, which found that resource shuffling of all types could lead to leakage of between 120 and 360 million tons of carbon dioxide (Borenstein et al., 2013). (The EMAC report did not assess whether the safe harbors would enable leakage; it looked only at what the effects of resource shuffling would be if there were no prohibition against it.)

In addition to presenting our concerns, we also developed a complete regulatory text to implement an alternative approach to controlling resource shuffling. Even if our suggestions could have been helpful, they probably arrived too late. That same month, CARB hosted a workshop to consider draft regulatory amendments that would codify the safe harbors into law. As it became clear that CARB would proceed without any public acknowledgement of the leakage problem, I wrote an op-ed in the San Jose Mercury News raising the issues described here (Cullenward, 2013a), as well as two comment letters addressing the technical and legal questions in the formal administrative process (Cullenward, 2013b, 2014a).

Over the following months, three of the six coal power plants that Weiskopf and I identified became involved in resource-shuffling-related transactions, leaking between 30 and 60 million tons of carbon dioxide out of California's carbon market (Cullenward, 2014b).

Two of these contracts have already left the regulatory system, while a third under which the Los Angeles utility LADWP imports power from the coalfired Navajo Generating Station on tribal lands in Arizona-is on its way out. In a regulatory filing connected with its purchase of replacement power, LADWP even disclosed that a benefit of divestment from the Navajo Generating Station would be "relieving LADWP from having to purchase emission credits" in the carbon market (LADWP, 2013: 3). Yet, as I pointed out in my second comment letter to CARB (Cullenward, 2014a), there is little doubt that the utility's divestment plan fits squarely in one or more of the safe harbors, and therefore does not violate CARB's guidance. By the time CARB unanimously voted to approve its new regulations, it had substantial evidence that its safe harbors were facilitating significant leakage—despite AB 32's clear requirements to the contrary.

A weak cap

What does leakage mean for California's climate policy? First and foremost, it means the "cap" in cap-and-trade is much less than it seems.

Return for a minute to the analogy of carbon markets as a game of musical chairs. Earlier, I suggested that so long as the government sets out the right number of chairs (a shrinking supply of emissions permits), the game should run smoothly. But resource shuffling essentially allows players to leave the game—say, by offering them an open spot on a comfortable couch in a nearby room. If resource shuffling is allowed, counting the number of chairs no longer provides reliable information about the environmental performance of the system.

And that's the major flaw in California's system. Now that resource shuffling is happening, we know that California's supposed reductions reflect bad bookkeeping, because the market cap is no longer firm. If the remaining coal power imports leave the carbon market, or if utilities take full advantage of the other safe-harbor provisions, a significant majority of the market's apparent emissions reductions will be attributable to leakage, not progress.

Although the market is no longer producing the net emissions reductions for which it was designed, it does have other, positive impacts. Notably, it sets a minimum price, which was \$11.34 per metric ton of carbon dioxide in July 2014. The price had previously ranged from approximately \$13 to \$20 per ton, but began a steady decline in approximately July 2013. As this article went to press, it rested slightly above the price floor, as can be seen at the California Carbon Dashboard website (http://calcarbondash.org). These data show that an oversupply of emissions permits—caused in no small part by reduced demand due to resource shuffling-has crashed the market price down to its legal minimum.

Curiously, so long as these conditions persist, the market actually looks like a carbon tax. In other words, after years of complex negotiations, emissions trading, and hundreds of pages of market rules, California's market operates much like the carbon tax (or "fee") policies preferred by both moderate Republicans (Paulson, 2014; Shultz and Becker, 2013) and grassroots environmentalists (Citizens' Climate Lobby, 2014)—only without the transparency and accountability mechanisms that motivate many of these advocates' positions.⁷ Perhaps simplicity is a virtue in climate policy after all.

Cullenward 41

In all fairness, California has managed to create the highest price on carbon pollution in the United States. It also has robust energy policies that are encouraging the expanded use of clean and efficient resources. These are all significant accomplishments, but the carbon price is still too low to do much good. We know it is lower than the actual cost of California's clean energy policies—for example, CARB reports that California's clean fuels policy credits were trading between \$63 and \$79 per metric ton of carbon dioxide during the last three months of 2013 (CARB, 2014), well above the carbon market price-and therefore the carbon market is not driving compliance in those sectors. In any case, the market price is certainly lower than the levels needed for the long-term transformation of the energy system.

A cautionary tale

Can anything be done about the failure of California's flagship carbon market to live up to expectations? Yes, but the political challenges are far greater than the technical issues. At this point, there is only one solution that can preserve the market's integrity: CARB must observe the leakage that results from its permissive resource shuffling rules, then tighten the overall market cap accordingly. (In my musical chairs analogy, this means removing a chair for every person who leaves the game before the music stops.) But acknowledging and resolving the problem will likely increase the carbon market price, and hence political opposition.

Some stakeholders prefer to place hope in new developments in state and federal climate policy. They argue that resource shuffling will be less of a probadopt their own climate regulations. For example, the leaders of California, Oregon, Washington, and British Columbia signed an agreement to harmonize their approach to climate policy (Center for Climate and Energy Solutions, 2013). There is little chance, however, of a similar agreement with southwestern states, where most of California's legacy coal power imports originate. Waiting for the Environmental Protection Agency to act isn't an option, either. Assuming that the EPA's proposed rules are finalized and survive intense litigation, they won't produce results until after 2020, the current end date for California's legally binding market. (Moreover, the proposed federal rules do not apply to tribal lands, yet two of the three coal-fired power plants that have already leaked from California's market are located in Navajo territory.) Thus, the prospects for California's neighbors to independently resolve this problem are dim.

Even if CARB fails to address the leakage issue, California's experience offers useful insights into the politics of climate policy-though the precise lessons depend on one's point of view. The optimistic perspective looks something like this: Perhaps the flaws in the current plan reflect realistic concessions on the road to deep, long-term emissions reductions. (State policy makers are currently discussing how to set a goal for 2030 and have a nonbinding aspirational target of reducing emissions 80 percent below 1990 levels by 2050.) Even the most proactive government officials have to navigate a maze of political obstacles, technically complex issues, and the constant threat of litigation-especially when working on controversial issues such as climate policy, which challem if enough of California's neighbors lenges powerful established interests. Sometimes policy makers make mistakes, and sometimes they make compromises. Whatever the case here, the good news is that a state can only rely on leakage once: After the high-emitting resources are gone, there are no more opportunities for resource shuffling. Instead of fighting over complex market rules, climate policy makers should focus on raising the minimum market price in future reforms. Their critics should remember that the complementary policies are unaffected by a weak market cap.

Taking a less optimistic perspective, one might question the credibility of the market regulators. At the end of the day, CARB let the utilities write their own rules. Whether CARB intended to rely on leakage to artificially lower the market price, or simply didn't understand what its economic advisers were saying about the probable consequences of these reforms, it deferred to the industry it was charged with regulating. Political realists who worry about costs should also be concerned with the environmental performance of policy instruments designed to keep costs low; California will need these policies to work if it is to achieve long-term climate targets. Equally important is consistency with the rule of law, which will be necessary to strengthen climate policy over the coming decades. From this perspective, relying on questionable accounting tricks is hardly the mark of a strong regulator that is prepared to impose tough rules for 2030 and beyond.

If there is a broader lesson in California's experience, it is this: The political and technical challenges of implementing climate policy are greater than most people appreciate—even within the expert community, which tends to view

carbon markets as both eminently tractable (Newell et al., 2014) and politically expedient (Stavins, 2014). It is not enough to pass legislation or propose new regulations. Indeed, that is only the beginning.

Acknowledgements

Thanks to Jonathan Koomey, Michael Wara, and David Weiskopf for their feedback and insights. Any errors and all opinions are my own.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Notes

- I. Many people incorrectly think of the carbon market as a European invention because the European Union was the first to apply it to climate policy. Europe did create the world's largest carbon market, the EU Emissions Trading Scheme, as part of its Kyoto Protocol obligations (Ellerman et al., 2007). Nevertheless, emissions trading actually got its start in the United States. For example, the US Environmental Protection Agency developed capand-trade markets to control lead in gasoline in the 1980s (Stavins, 2014) and for sulfur dioxide pollution from power plants in the 1990s (Ellerman et al., 2000).
- This is not to say that California's climate policy is too expensive. My point is merely that the apparent cost observed in the carbon market is significantly lower than the true cost.
- 3. This challenge is not unique to California; it applies to nearly all sub-national carbon markets, including the Regional Greenhouse Gas Initiative and the pilot programs in China (Cullenward and Wara, 2014). So long as the carbon market is smaller than the region's electricity market, cross-border accounting issues will be present.
- 4. See California Health and Safety Code (2014: §§ 35852(b), (b)(8)).

Cullenward 43

- 5. See Legislative Counsel of California (2014: § 38505(j)).
- See California Code of Regulations (2014: § 95852(b)(2)). The attestation requirement was suspended soon after adoption and recently repealed in its entirety.
- 7. Although advocates of these policies use different terminologies, they share the common goal of putting a price on emissions—for all practical purposes, a tax. But framing matters in politics. Citizens' Climate Lobby eschews "tax" and prefers "fee and dividend," returning all revenue back to households. Shultz and Becker promote a "revenue-neutral carbon tax," which they distinguish from other taxes by requiring that all revenues be returned to individual (and potentially corporate) taxpayers. Finally, others, like Paulson, refer simply to a carbon tax, without specifying how the revenue would be used.

References

- APS (2013) APS completes purchase at Four Corners Power Plant. December 31. Available at: www.aps. com/en/ourcompany/news/latestnews/Pages/ aps-completes-purchase-at-four-corners-powerplant.aspx.
- Borenstein S, Bushnell J, Wolak FA et al. (2013) Forecasting supply and demand balance in California's greenhouse gas cap and trade market. Emissions Market Assessment Committee draft, June 12. Available at: web.stanford.edu/group/fwolak/ cgi-bin/sites/default/files/files/POWERv8_june_ 2013.pdf.
- California Air Resources Board (CARB) (2008)
 Climate change scoping plan: A framework for change. December. Available at: www.arb.ca. gov/cc/scopingplan/document/scopingplan document.htm.
- California Air Resources Board (CARB) (2012a) California cap-and-trade program, Resolution 12-51, Attachment A. October 18. Available at: www.arb. ca.gov/cc/capandtrade/resolutions/resolutions. htm.
- California Air Resources Board (CARB) (2012b) Capand-trade regulation instructional guidance, Appendix A: What is resource shuffling? November. Available at: www.arb.ca.gov/cc/capand-trade/guidance/appendix_a.pdf.
- California Air Resources Board (CARB) (2014) 2013 LCFS reporting tool (LRT) quarterly data summary—

- Report no. 3. January 27. Available at: www.arb.ca.gov/fuels/lcfs/20140123_q3datasummary.pdf.
- California Code of Regulations (CCR) (2014) Title 17, Division 3, Chapter 1, Subchapter 10, Subarticle 7. Available at: http://govt.westlaw.com/calregs/ Browse/Home/California/California CodeofRegulations?guid=I3984AFF1E67711E2960 E9FD1BEAA332C.
- Center for Climate and Energy Solutions (2013) Pacific Coast pact ushers in climate policy alignment.

 Available at: www.czes.org/us-states-regions/news/2013/pacific-coast-pact-ushers-climate-policy-alignment.
- Citizens' Climate Lobby (2014) Carbon fee and dividend FAQ. Available at: http://citizensclimatelobby.org/about-us/faq/.
- Cullenward D (2013a) Danny Cullenward: Don't let accounting tricks dominate the carbon market. San Jose Mercury News, October 21. Available at: www.mercurynews.com/opinion/ci_24354840/danny-cullenward-dont-let-accounting-tricks-dominate-carbon.
- Cullenward D (2013b) Proposed amendments to the California cap-and-trade program (September 4, proposed regulation order). Letter to the Air Resources Board, October 23. Available at: www. arb.ca.gov/lists/com-attach/4-acc2013-VDcAc1 wxAzwBYgZo.pdf.
- Cullenward D (2014a) Comments on proposed capand-trade regulations, 15-day changes, resource shuffling safe harbors—§ 95852(b). Letter to the Air Resources Board, April 4. Available at: www.arb.ca.gov/lists/com-attach/253-capandtrade13-VjVcNVY6UW9WNQln.pdf.
- Cullenward D (2014b) Leakage in California's carbon market: Preliminary trading is consistent with expected impacts of regulatory changes. University of California, Berkeley, working paper, June 21. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2458773.
- Cullenward D and Wara M (2014) Carbon markets: Effective policy? Science, June 27. Available at: www.sciencemag.org/content/344/6191/1460.2. full.
- Cullenward D and Weiskopf D (2013) Resource shuffling and the California carbon market. Stanford Law School ENRLP Program working paper, July 18. Available at: www.law.stanford.edu/publications/resource-shuffling-and-the-california-carbon-market.
- Ellerman AD, Buchner BK, and Carraro C (2007)

 Allocation in the European Emissions Trading
 Scheme: Rights, Rents and Fairness. Cambridge:
 Cambridge University Press.

- Ellerman AD, Joskow PL, Schmalensee R et al. (2000) Markets for Clean Air: The U.S. Acid Rain Program. Cambridge: Cambridge University Press.
- Joint Utilities Group (2012) IOUs proposed remedies for outstanding concerns regarding resource shuffling language in the ARB's cap-and-trade regulation. Presentation at a public meeting of the Emissions Market Assessment Committee, September 24. Available at: www.arb.ca.gov/cc/capandtrade/emissionsmarketassessment/iouresource-shuffling-proposal-09-24-12.pdf.
- Legislative Counsel of California (2014) California Health and Safety Code. Available at: www.leginfo. ca.gov/cgi-bin/calawquery? codesection=bsc.
- Los Angeles Department of Water and Power (LADWP) (2013) Board approval letter, LADWP Apex Power Project power sales agreement no. BP 13-055, November 26. Available at: http://clkrep.lacity.org/onlinedocs/2013/13-1635_rpt_bwp_12-4-13.pdf.
- Newell RG, Pizer WA and Raimi D (2014) Carbon market lessons and global policy outlook. Science, March 21. Available at: www.sciencemag.org/ content/343/6177/1316.summary.
- Nichols MD (2014) California is showing how it can work. *New York Times*, June 1. Available at: www.nytimes.com/roomfordebate/2014/06/01/canthe-market-stave-off-global-warming/california-is-showing-how-cap-and-trade-can-work.
- Paulson HM (2014) The coming climate crash. New York Times, June 21. Available at: www.nytimes. com/2014/06/22/opinion/sunday/lessons-for-climate-change-in-the-2008-recession.html.
- Shultz GP and Becker GS (2013) Why we support a revenue-neutral carbon tax. Wall Street Journal,

- April 7. Available at: http://online.wsj.com/news/articles/SBio00i424i278873236ii6045783 9640i965799658.
- Stavins RN (2014) The only feasible way of cutting emissions. New York Times, June 2. Available at: www.nytimes.com/roomfordebate/2014/06/01/can-the-market-stave-off-global-warming/cap-and-trade-is-the-only-feasible-way-of-cutting-emissions.
- Wara M (2014) California's energy and climate policy: A full plate, but perhaps not a full model. *Bulletin of the Atomic Scientists* 70(5). DOI: 10.1177/0096340214546832.

Author biography

Danny Cullenward is the inaugural Philomathia Research Fellow at the Berkeley Energy and Climate Institute (BECI) at the University of California, Berkeley, USA. An energy economist and lawyer by training, his work focuses on the design and implementation of science-based climate policy. Cullenward has been working on carbon markets for 10 years. In 2013, he represented climate scientists before the Ninth Circuit, successfully defending the constitutionality of California's climate policy. He holds a PhD in Environment & Resources (E-IPER) from Stanford University and a JD from Stanford Law School.

Appendix A – Comment Letters

Exhibit 3

 From:
 _Chang, Edie@ARB

 To:
 _Brent Newell

Subject: RE: C&T Adaptive Management Plan

Date: Wednesday, August 19, 2015 6:08:21 PM

Hi Brent — we don't release information about transactions within the C&T program because that information is considered market sensitive. There is information posted on our website about allowance allocation

(http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/v2015allocation.pdf) and auction participation (http://www.arb.ca.gov/cc/capandtrade/auction/may-

2015/summary_results_report.pdf and http://www.arb.ca.gov/cc/capandtrade/auction/may-2015/ca_proceeds_report.pdf .

As I mentioned in my note, we're going to starting some outreach in the fall on AM. We've haven't taken actions on adaptive management to date.

Thanks,

Edie

From: Brent Newell [mailto:bnewell@crpe-ej.org] Sent: Tuesday, August 18, 2015 5:28 AM

To: Chang, Edie@ARB

Subject: RE: C&T Adaptive Management Plan

Edie,

Please send me information (1) on where facilities obtained their allowances/offsets for the 2013 compliance event; and (2) any actions ARB has taken pursuant to the Adaptive Management Plan in response to the 2013 compliance event.

Thanks!

PLEASE NOTE OUR NEW ADDRESS

BRENT NEWELL
CENTER ON RACE, POVERTY & THE ENVIRONMENT
1999 HARRISON STREET, SUITE 650
OAKLAND, CA 94612
(415) 346-4179 x304
(415) 346-8123 FAX
BNEWELL@CRPEELORG

"True peace is not merely the absence of tension; it is the presence of justice." – Dr. Martin Luther King



PROVIDING LEGAL AND TECHNICAL ASSISTANCE TO THE GRASSROOTS MOVEMENT FOR ENVIRONMENTAL JUSTICE



PRIVILEGE AND CONFIDENTIALITY NOTICE
THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS
ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED. CONFIDENTIAL AND EXEMPT
FROM DISCLOSURE UNDER APPLICABLE LAW AS ATTORNEY CLIENT AND WORK-PRODUCT
CONFIDENTIAL OR OTHERWISE CONFIDENTIAL COMMUNICATIONS. IF THE READER OF THIS
MESSAGE IS NOT THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION,
DISTRIBUTION, OR COPYING OF THIS COMMUNICATION OR OTHER USE OF A TRANSMISSION
RECEIVED IN ERROR IS STRICTLY PROHIBITED.

From: Chang, Edie@ARB [mailto:edie.chang@arb.ca.gov]

Sent: Friday, August 14, 2015 10:26 AM

To: Brent Newell

Subject: RE: C&T Adaptive Management Plan

HI Brent - I've attached links to the cap and trade data that is available.

Reported and verified GHG emissions data is available here. The latest data posted is 2013. We will be posting the 2014 data in November. We've been collecting data under the reporting reg since 2008 and I think it's available on that website. http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm

We have had one compliance event so far - in November of 2014. At that time, entities were required to submit allowances to cover 30% of their 2013 emissions. This is the report from that compliance event. You can see how many compliance instruments (allowances and offset) each entity submitted and also what offsets were used. Our next compliance event is November 2015 at which time allowances to cover the remaining 70% of 2013 emissions and 100% of 2014 emissions will be due. We will post a similar report after that compliance event. http://www.arb.ca.gov/cc/capandtrade/2013compliancereport.xlsx

This is a report that shows the total compliance instruments that have been issued. http://www.arb.ca.gov/cc/capandtrade/complianceinstrumentreport.xlsx

We're continuing to work on our adaptive management plan and will be starting some outreach in the fall. Let me know if you have any questions, Edie

From: Brent Newell [mailto:bnewell@crpe-ej.org]
Sent: Thursday, August 13, 2015 3:39 PM

To: Chang, Edie@ARB

Subject: C&T Adaptive Management Plan

Edie,

I hope all is well. On the CAA 111(d) call in July you mentioned that ARB had analyzed cap and trade program data for 2013 as part of the Adaptive Management Plan. I would like to receive that data,

especially data that shows how each source met its compliance obligation (e.g. through surrendering allowances, buying offsets, etc.). I'd also like to receive source specific emissions data to understand how each source has increased or decreased its emissions under cap and trade.

Please advise.

Thanks, Brent

PLEASE NOTE OUR NEW ADDRESS

BRENT NEWELL
LEGAL DIRECTOR
CENTER ON RACE, POVERTY & THE ENVIRONMENT
1999 HARRIS ON STREET, SUITE 650
OAS AND 1198 304
(115) 3138 3723 FAX
BNEWELL @CRPEEL ORG

"True peace is not merely the absence of tension; it is the presence of justice." - Dr. Martin Luther King



PROVIDING LEGAL AND TECHNICAL ASSISTANCE TO THE GRASSROOTS MOVEMENT FOR ENVIRONMENTAL JUSTICE



PRIVILEGE AND CONFIDENTIALITY NOTICE
THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS
ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED, CONFIDENTIAL AND EXEMPT
FROM DISCLOSURE UNDER APPLICABLE LAW AS ATTORNEY CLIENT AND WORKFRODUCT
CONFIDENTIAL OR OTHERWISE CONFIDENTIAL COMMUNICATIONS. IF THE READER OF THIS
MESSAGE IS NOT THE INTENDED RECIPIENT. YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION,
DISTRIBUTION, OR COPYING OF THIS COMMUNICATION OR OTHER USE OF A TRANSMISSION
RECEIVED IN ERROR IS STRICTLY PROHIBITED.

Exhibit 4

Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities: Initial Report

Office of Environmental Health Hazard Assessment

California Environmental Protection Agency

February 2017



Preface

This report has been prepared in response to a directive issued by Governor Brown for an analysis of the state's response to climate change under the Global Warming Solutions Act of 2006 (AB 32). Specifically, the directive calls for the Office of Environmental Health Hazard Assessment (OEHHA) to prepare a report analyzing the benefits and impacts of the greenhouse gas emissions limits adopted by the California Air Resources Board (ARB) within disadvantaged communities. OEHHA is to update the report at least every three years.

The state's climate policies (e.g., Cap-and-Trade, zero emissions vehicles, renewable energy, low carbon fuel standard) are reducing greenhouse gas emissions statewide as well as contributing to reductions in other pollutants. This report is the first step in an investigation of whether the design and implementation of these climate policies are facilitating decreases or increases in pollutants of concern in disadvantaged communities.

OEHHA's mission is to protect and enhance public health and the environment of California through the evaluation of risks posed by hazardous substances. To carry out that mission, OEHHA provides scientific assistance to the state's other environmental and health agencies on projects involving hazard identification, exposure and toxicity assessment, and health and ecological risk assessment. The mission of ARB is to promote and protect public health, welfare and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the state.

The focus of this initial report is on large stationary sources in the Cap-and-Trade Program, one of the elements of the state's climate change programs that is aimed at gradually reducing greenhouse gas emissions from large industrial sources through a market-based mechanism. It is limited in scope, but aims to be a starting point for future analyses. Later reports will also address the benefits and impacts of other AB 32 programs to reduce greenhouse gas emissions. The report does not explore the benefits associated with investments of Cap-and-Trade auction revenue. Subsequent reports will investigate impacts such as changes in toxic air contaminants emitted by mobile sources.

This report is one of several efforts by researchers and government entities to address airquality impacts on disadvantaged communities. Cushing *et al.* (2016) investigated the locations and pollution from large stationary sources of greenhouse gas emissions in California that are covered under the Cap-and-Trade Program. ARB continues to implement its adaptive management program to identify and track emissions increases, if any, that are attributable to implementing the Cap-and-Trade Program. AB 197 (Garcia, Statutes of 2016) directs ARB to prioritize programs to achieve direct emissions reductions from large stationary sources and

mobile sources. AB 197 also requires ARB to graphically display data on the emissions of greenhouse gases, criteria pollutants, and toxic air contaminants on its website. These efforts over time will improve our knowledge of how California's climate change programs and older, more established regulatory programs affect emissions levels of criteria and toxic pollutants, and improve our understanding of emissions changes attributable to actions taken pursuant to AB 32.

In summary, OEHHA's work here complements other efforts underway to understand potential impacts from the state's various programs to reduce greenhouse gas emissions. There are also efforts to increase access to information on stationary-source emissions for a range of pollutants. This information is expected to inform future proposals to require further reductions in emissions of criteria, toxic, and greenhouse gases from industrial sources.

Table of Contents

Pre	face	. i
Exe	cutive Summaryv	iii
Ĺ	Introduction	. 1
Ш	Scope of Analysis	. 3
	Benefits and Impacts	. 3
	Disadvantaged Communities	. 3
	Greenhouse Gas Emissions Limits Adopted by the State Air Resources Board	. 5
	Initial Focus of AB 32 Impact and Benefit Analysis: Cap-and-Trade Program	. 7
	The Cap-and-Trade Program	. 8
Ш	Facilities Subject to the Cap-and-Trade Program: Description and Proximity to	
	Disadvantaged Communities	10
	What Are the GHG Facilities?	10
	What Are the Sources of Emissions from GHG Facilities Covered by the Cap-and-Trade	
	Program?	11
	Where Are GHG Facilities?	14
I۷	Proposed Analytic Approach to Characterize Benefits and Impacts	17
	Key Questions	17
	Challenges in Evaluating the Benefits and Impacts of the Cap-and-Trade Program	17
	Practical Steps for Initial Analysis	19
٧	Data Used to Characterize Emissions of GHG and Air Toxics Emissions from GHG	
	Facilities	19
	Mandatory Reporting of Greenhouse Gas Emissions	19
	Air Toxics "Hot Spots" Emission Inventory	21
	Criteria Air Pollutant Emissions	22
	Toxic Release Inventory (TRI; US Environmental Protection Agency)	23
	General Limitations to the Use of Emissions Data as an Indicator of Benefits and Impacts 2	23
VI	Toxicity of GHGs and other Air Pollutants	24
	Greenhouse Gases	24
	Criteria Air Pollutants.	25

	Toxic Air Contaminants	26
VII	Results	27
	Toxicity-Weighted Emissions to Air	27
	Air Toxics and GHGs Emissions	33
	Criteria Air Pollutant and GHG Emissions	37
	Case Study: Cement Plants	40
	Case Study: Refineries	44
VIII	Discussion & Conclusions	48
	Future Data Collection and Analysis	49
Δnn	pendix A	۱-۵

List of Figures

Figure 1.	Communities Identified as "Disadvantaged" under SB 535 (in Red) Using CalEnviroScreen Version 2.0 Results (October 2014)
Figure 2.	California Map Showing the Locations of GHG Facilities and SB 535 Disadvantaged Communities
Figure 3.	Scatterplot of Toxicity-Weighted Emissions vs GHG Emissions from GHG Facilities with Emissions Data, by Cap-and-Trade Program Sectors (n=201)*
Figure 4.	Scatterplots of Toxicity-Weighted Emissions vs GHG Emissions (MTCO ₂ e) by Capand-Trade Program Sectors (plotted on logarithmic scale)
Figure 5.	Scatterplots of Criteria Air Pollutant Emissions from All GHG Facilities with Emissions Data for the 2014 Reporting Year (n \approx 316; Criteria Air Pollutant Emissions vs. GHG Emitter-Covered Emissions in MTCO $_2$ e)
Figure 6.	Location of Cement Plants Covered by the Cap-and-Trade Program
Figure 7.	Cement Plants: Emitter Covered Emissions of GHGs (MTCO2e, MRR Data) (Top), Toxicity-Weight Air Emissions (TRI Data) (Middle) and PM2.5 Emissions (in tons, CEIDARS Data) (Bottom) over the Years 2011-2014
Figure 8.	Location of Refineries Covered by the Cap-and-Trade Program
Figure 9.	Refineries: Emitter Covered Emissions of GHGs (MRR Data) (Top), Toxicity-Weighted Air Emissions (TRI Data) (Middle), and PM2.5 Emissions (CEIDARS Data) (Bottom) for 18 Refineries Over the Years 2011-2014
	List of Tables
Table 1.	AB 32-Related Programs and Initiatives to Reduce GHG Emissions6
Table 2. 0	GHG Emissions in 2014 by Cap-and-Trade Program Industry Sector for Facilities Reporting Emissions (Emitter-Covered Emissions in $MTCO_2e$)
Table 3. (GHG- and Air Toxic-Generating Activities and Processes in Primary Sectors of GHG Facilities Covered by the Cap-and-Trade Program (based on 2014 Inventory of Facilities)
Table 4. /	Analysis of Proximity of GHG Facilities to SB 535 Disadvantaged Communities (Based on Geocoding by Facility Street Addresses)
Table 5. I	Partial List of Information Available from Mandatory Greenhouse Gas Emissions Reporting
Table 6. I	Information Available in the Annual Compliance Report for the Cap-and-Trade Program (ARB)
Table 7. S	Sources of Exposure and Health Effects of Criteria Air Pollutants

Table 8. Frequency of Specific Chemical Emissions for Facilities with Reported Air Toxics Emissions by Cap-and-Trade Sector (Criteria Air Pollutants Excluded)
Table 9. Twenty-Five Cap-and-Trade Facilities with the Highest Toxicity-Weighted Air Emissions.* Shaded Facilities Are In or Within ½ Mile of an SB 535 Census Tract 32
Table 10. Correlation for GHG Emissions vs. Toxicity-Weighted Air Toxics Emissions for Cap- and-Trade Facility by Sector (2014 Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05)
Table 11. Correlations between Emitter Covered GHG Emissions (in MTCO₂e) and Criteria Air Pollutant Emissions (in pounds) for All Cap-and-Trade Facilities with Emissions Data (2014 Data)
Table 12. California Cement Plants Evaluated for GHG and Air Toxics Emissions
Table 13. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. Toxicity- Weighted Air Emissions (TRI Data) or PM2.5 Emissions (CEIDARS Data) for Eight Cement Plants
Table 14. California Refineries Evaluated for GHG and Air Toxics Emissions. Shaded Rows Indicate Facilities within One-Half Mile of an SB 535 Disadvantaged Census Tract 45
Table 15. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. PM2.5 Emissions (CEIDARS Data) or Toxicity-Weighted Air Emissions (TRI Data) for Refineries*

Executive Summary

In the ten years since the enactment of the California Global Warming Solutions Act of 2006 (also known as AB 32), concerns have been expressed that the state's trailblazing efforts to reduce greenhouse gas (GHG) emissions may unintentionally impact low-income communities that are already burdened by pollution from multiple sources. More specifically, the concerns are that the state's GHG-reduction programs could prompt regulated businesses to make decisions resulting in more air pollution from facilities in those communities than would otherwise be the case even while statewide GHG emissions decrease.

Conversely, California's climate-change programs also offer the potential to benefit these low-income industrial communities, to the extent that the programs prompt investments by regulated businesses that reduce emissions of both GHGs and conventional air pollutants in the communities where they operate.

In December 2015, Governor Brown directed the Office of Environmental Health Hazard Assessment (OEHHA) to analyze possible benefits and impacts to communities identified as disadvantaged under SB 535 (De León, Chapter 830, Statutes of 2012) from the GHG-emissions limit adopted by the California Air Resources Board. These benefits and impacts include changes in emissions of GHGs, toxic air contaminants, and criteria air pollutants.

This is an initial report that provides the starting point for future, more comprehensive analyses of the impacts on disadvantaged communities of GHG-emission limits. As discussed below and in the body of the report, the emissions data available at this time do not allow for a conclusive analysis. This report makes some preliminary findings that OEHHA expects to build upon in future analyses as it acquires and evaluates more data. It does not provide definitive findings regarding the effects of the GHG limit on any individual community, or disadvantaged communities in general.

The focus of this first report is on one specific AB 32 program, the state's Cap-and-Trade Program. This program regulates facilities that produce a significant fraction of the state's GHG emissions, as well as toxic co-pollutants. There are adequate data available from the Cap-and-Trade Program to begin an evaluation of potential benefits and impacts from changes in emissions. Other GHG reduction programs will be covered in later report as more data related to these programs become available.

In time, the analysis of the Cap-and-Trade Program aims to address the following key questions:

 How do emissions of GHGs relate to emissions of toxic air contaminants and criteria air pollutants from the same facility?

- Are emissions disproportionately occurring in SB 535 disadvantaged communities? Do disadvantaged communities benefit from or are they negatively impacted by changes in GHG emissions from facilities subject to Cap-and-Trade?
- Are the benefits and impacts due to the design of the Cap-and-Trade Program?

While challenges described in this report preclude definitive answers to these questions, OEHHA's initial analysis in this report makes the following findings:

- 1. A disproportionate number of facilities subject to the Cap-and-Trade Program are located in SB 535 disadvantaged communities. The Cap-and-Trade Program covers several hundred facilities from different industrial sectors that are located across the state. Of the 281 facilities with street addresses that could be geocoded, more than half (57 percent) are located in or within one-half mile of an SB 535 disadvantaged community¹. More specifically, 15 of 20 refineries (75 percent), 5 of 7 hydrogen plants (71 percent) and 72 of the 110 facilities classified by ARB as "other combustion source" facilities (65 percent) are located in or within one-half mile of a disadvantaged community. While people's actual exposures to toxic co-pollutants emitted from these facilities would depend on various factors such as meteorological conditions and smokestack heights, changes in co-pollutant emissions resulting from the Cap-and-Trade Program would nonetheless tend to have disproportionate benefits (if emissions decrease) or adverse impacts (if emissions increase) on disadvantaged communities because of their proximity to these facilities.
- There were moderate correlations between GHG emissions and the emissions of criteria air pollutants. The strongest correlation was with fine particulate matter emissions (PM2.5). There was also moderate correlation between GHG and toxic chemical emissions across the entire set of Cap-and-Trade facilities with covered emissions. Some individual industrial sectors showed greater correlations between emissions of GHGs and toxic co-pollutants. Refineries overall showed a strong correlation, while cement plants showed a moderate correlation. Oil and gas production facilities also showed a moderate correlation, depending on the statistical measure used. Facilities in certain sectors with broad ranges in emissions levels (e.g. electricity generation facilities) showed increased correlation with a specific statistical analysis (logarithmic transformation). This report only looked at emissions from one recent year (2014), however, because this was the only year for which air toxics data could be obtained in time for this analysis.

¹ Identified in 2014. More on the identification of these communities can be found on CalEPA's website at the following URL: http://calepa.ca.gov/EnvJustice/GHGInvest/.

- 3. OEHHA also conducted a more detailed case study of nine cement plants and 19 refineries. These facilities have relatively high toxicity-weighted emissions, and data for the years 2011-2014 were available. The different plants showed varying levels of correlation among GHG, toxicity-weighted emissions, and PM2.5 emissions during the four-year period. Several cement facilities showed modest positive correlations between GHG and toxicity-weighted emissions, while two cement facilities showed poorer correlations. For refineries, there generally was a positive correlation between GHG and toxicity-weighted air emissions. Facilities with high levels of GHG emissions generally had higher PM2.5 and toxicity-weighted emissions. There were some differences among individual refineries in the relationships between GHGs, toxicity-weighted and PM2.5 emissions, perhaps reflecting differences in the kinds of products made at each of the refineries.
- 4. These results indicate that the relationship between GHGs and other pollutant emissions is complex. GHG facilities that emit higher levels of GHGs tend to have higher emissions of toxic air contaminants and criteria air pollutants. There is a need for additional investigation into the factors that drive emission changes, how GHG emission reductions are likely to be achieved in different industrial sectors, and what that may mean for concomitant changes in emissions of toxic air pollutants. Nonetheless, these analyses suggest that reductions in greenhouse gas emissions are likely to result in lower pollutant exposures in disadvantaged communities, based overall on the positive correlations observed for the 2014 data.

Limited data availability prevented OEHHA from conducting a more comprehensive analysis in time for this report. The Cap-and-Trade Program is a relatively new program, with the first auction of emissions instruments occurring in 2012. In 2013-2014, the program covered large industrial sources and electricity generation. In 2015, the program expanded to cover emissions from combustion of gasoline and diesel, as well as natural gas use in commercial and residential applications. In these early days of the program, it is hard to discern trends and make firm conclusions regarding patterns of changes in GHG emissions resulting from the program.

Further, data are not yet available to broadly cover emissions of toxic air pollutants from all facilities subject to the Cap-and-Trade Program. Data on emissions of GHGs, criteria air pollutants and toxic air pollutants are collected by multiple entities under different programs and statutory mandates. To date, there is no co-reporting of GHG and toxic emissions, and differences in reporting requirements across regulatory programs complicates data analysis. OEHHA will continue to acquire and analyze data for future reports, which will build upon the initial findings presented in this report.

In addition, toxic emissions data for many facilities are only updated every four years, further limiting conclusions that can be reached. OEHHA currently only has a limited set of data to examine changes in emissions that would illuminate statewide patterns, especially with respect to disadvantaged communities. A further complexity for the analysis is that the relationships between GHG and co-pollutant emissions vary across different industrial sectors (and even within facilities within a sector) with the differences in fuel types and sources, industrial processes and chemical feedstocks.

Therefore, at this point in time, when the program is still new, OEHHA cannot make definitive conclusions regarding changes in emissions due to the Cap-and-Trade Program that may disproportionately affect disadvantaged communities. OEHHA expects with time the picture will become clearer. As the program continues to generate data over the next several years, it will be easier to detect and evaluate emissions trends. OEHHA intends to update the analysis in subsequent reports as additional types of data and years of data emerge. Co-reporting of high quality data on criteria, air-toxic and GHG emissions for the facilities subject to the Cap-and-Trade Program would substantially aid the investigation of emissions impacts.

In future reports, OEHHA also plans to expand the analysis to cover AB 32 programs in addition to the Cap-and-Trade Program. It will be important to evaluate the Cap-and-Trade Program in concert with other climate policies to gauge how the entire climate change program in aggregate may impact or benefit individual disadvantaged communities and as a whole. Examination of emissions changes in the transportation sector resulting from the large and varied AB 32 programs affecting it will be an important part of this more comprehensive evaluation.

Introduction

In the ten years since the enactment of the California Global Warming Solutions Act of 2006 (also known as AB 32), concerns have been expressed that the state's trailblazing efforts to reduce greenhouse gas (GHG) emissions may unintentionally impact low-income communities that are already burdened by pollution from multiple sources. A concern is that the state's GHG-reduction programs could prompt regulated businesses to make decisions resulting in higher emissions of conventional air pollutants at facilities in those communities than would otherwise be the case even while statewide GHG emissions decrease.

Conversely, California's climate-change programs also offer the potential to benefit these low-income industrial communities, to the extent that the programs prompt investments by regulated businesses that reduce emissions of both GHGs and conventional air pollutants in the communities where they operate.

In December 2015, Governor Brown directed the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) to analyze and periodically report on the impacts and benefits on disadvantaged communities related to the state's emission controls to mitigate climate change:

"I am directing that the Office of Environmental Health Hazard Assessment (OEHHA) prepare by December 1, 2016, a report analyzing the benefits and impacts of the greenhouse gas emissions limits adopted by the State Air Resources Board pursuant to Division 25.5 (commencing with Section 38500) of the Health and Safety Code within disadvantaged communities described in Health and Safety Code Section 39711. The report shall be made available to the public and the Legislature. OEHHA shall update the report at least every three years.

The report, at a minimum, shall track and evaluate (a) greenhouse gas emissions, criteria air pollutants, toxic air contaminants, short-lived climate pollutants, and other pollutant emission levels in disadvantaged communities; and (b) public health and other environmental health exposure indicators related to air pollutants in disadvantaged communities."

This report is the initial response to this directive. OEHHA has examined readily available information to evaluate possible analytical approaches, and has conducted an initial analysis of one major activity to reduce greenhouse gas (GHG) emissions – the Cap-and-Trade Program. The California Air Resources Board (ARB) established this program in regulation² pursuant to

² Originally adopted in 2011. The current Cap-and-Trade regulation can be found at the following URL: https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

Health and Safety Code Section 38500 enacted by Assembly Bill (AB) 32 (Núñez, Statutes of 2006), also known as the Global Warming Solutions Act of 2006).

Under the Cap-and-Trade Program, ARB applies a statewide cap on GHG emissions from a number of entities that are responsible for emissions of GHGs. The covered entities represent a variety of industrial sectors. These include electricity generators, food processors, other industrial facilities that burn large quantities of fossil fuels, as well as mobile sources. Facilities are required to surrender state-issued emission allowances and emission offset credits equal to their reported and verified GHG emissions. Over time, the aggregate cap (the total amount of GHG emissions allowed from all covered facilities declines). The regulation provides flexibility in how covered GHG emitters may comply with the overall emissions cap, allowing them to seek the least costly options. Reductions of GHGs may have the added benefit of reducing emissions of toxic air contaminants, ozone-producing gases and criteria air pollutants. The varied distribution on where facilities are located across California and the flexibility of the program can mean that changes in emissions of GHGs do not occur evenly across communities.

A variety of factors in addition to the Cap-and-Trade Program can affect the amount of GHG emitted by a facility including regional or global economic trends and consumer demand, drought, facility shutdowns (e.g., the shutdown of the San Onofre Generating Station) and responses to other policies (e.g., the renewable portfolio standard for electricity generation).

While this initial report focuses on the Cap-and-Trade Program, future reports will also include assessment of other GHG emission reductions programs set in place to meet AB 32 requirements. Some of these other programs are expected to significantly benefit and possibly impact communities' exposures to co-pollutants. These analyses should prove useful for informing future decisions by the state's climate change programs, including mitigating unintended impacts and maximizing benefits from reductions of co-pollutant emissions in disadvantaged communities. However, the Cap-and-Trade Program is still relatively new, with the first auction of emissions instruments occurring in 2013. In these early days of the program, it is hard to discern trends and make firm conclusions regarding patterns of emissions resulting from the program.

This report also highlights the need for data collection practices that would be helpful in enabling ongoing tracking of changes that may be occurring across California communities from the state's efforts to address climate change.

Finally, as described later in this report, GHG, criteria and air-toxic emissions are regulated under different programs. ARB regulates GHG emissions pursuant to AB 32, while local air districts regulate criteria and air-toxic emissions from facilities through their permitting processes. Each of these programs can affect emissions levels of these three classes of

pollutants, and make evaluation of emissions of air toxic contaminants and criteria air pollutants that are attributable to the cap-and-trade program challenging.

Scope of Analysis

This report is directed at the question of whether certain communities, especially disadvantaged communities, are positively or negatively impacted from changes in exposures to environmental pollutants as a result of regulatory responses to the statewide GHG emissions limit adopted pursuant to AB 32. The scope of the analysis is necessarily limited in this initial report because of the limited data currently available, and the relatively short period of time since the implementation of the Cap-and-Trade Program. This section describes some methods that will be used to characterize benefits and impacts of the GHG reduction program, the definition of disadvantaged communities for the analysis, and the GHG reduction program of initial focus.

Benefits and Impacts

For this report, "benefits and impacts" are changes in pollutant exposures in communities resulting from changes in response to the Cap-and-Trade Program. The directive requires that the report, at a minimum, track and evaluate "greenhouse gas emissions, criteria air pollutants, toxic air contaminants, short-lived climate pollutants, and other pollutant emission levels" in disadvantaged communities, and also track and evaluate "public health and other environmental health exposure indicators related to air pollutants" in disadvantaged communities. This report provides information on levels of GHG emissions in communities, while using indicators of levels of criteria air pollutants, toxic air contaminants and other pollutants. Later reports will also identify and track public and environmental exposures indicators as measures of benefits and impacts, and will examine the effects of other GHG reduction programs in addition to the Cap-and-Trade Program. For example, the transportation sector, which is the largest source of GHG, criteria pollutant, and toxic emissions, will be addressed in later reports.

For this first report, we investigate the following emissions in communities:

- Greenhouse gases, including non-CO2 compounds with global warming potential
- Criteria air pollutants
- · Toxic air contaminants

Disadvantaged Communities

The directive requires that benefits and impacts be analyzed within "disadvantaged communities" as described in H&SC Section 39711, established by Senate Bill (SB) 535 in 2012. SB 535 requires the California Environmental Protection Agency (CalEPA) to identify

disadvantaged communities for investment of Cap-and-Trade proceeds. These communities are to be identified based on geographic, socioeconomic, public health and environmental hazard criteria, and may include, but are not limited to, either of the following:

- (1) Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation.
- (2) Areas with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment.

In October 2014, following a series of public workshops to gather public input, CalEPA released its list of disadvantaged communities for the purpose of SB 535. CalEPA based its list on the most disadvantaged communities identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), a tool developed by OEHHA that assesses all census tracts in California to identify areas disproportionately burdened by and vulnerable to multiple sources of pollution.

The analyses described and presented here focus on those California communities (census tracts) identified in 2014 by CalEPA as disadvantaged using Version 2.0 of the CalEnviroScreen tool.³ These communities are the highest-scoring census tracts in the state using the results of the tool, and represent about 25% of the state's population (see Figure 1 below).

³ Information on the specific communities/census tracts identified as "disadvantaged" for purposes of SB 535 can be found on CalEPA's website at the following URL: http://calepa.ca.gov/EnvJustice/GHGInvest/.

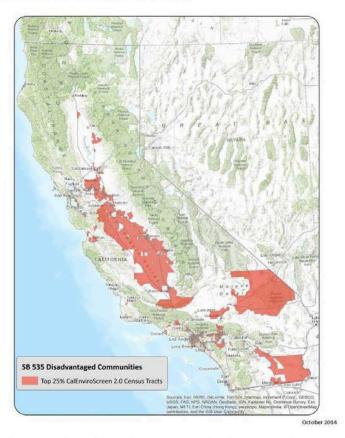


Figure 1. Communities Identified as "Disadvantaged" under SB 535 (in Red) Using CalEnviroScreen Version 2.0 Results (October 2014).

OEHHA updated its statewide analysis of communities with the public release of Version 3.0 of CalEnviroScreen in January 2017. Later in the year CalEPA will make a new identification of "disadvantaged communities" that is expected to rely at least in part on the CalEnviroScreen 3.0 results. Since that new designation has yet to be made, this evaluation of the Cap-and-Trade Program utilizes CalEPA's 2014 designation of disadvantaged communities.

Greenhouse Gas Emissions Limits Adopted by the State Air Resources Board

The directive specifically calls for OEHHA to analyze the benefits and impacts of the greenhouse gas emissions limits adopted by ARB pursuant to AB 32.

AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. This has been estimated to require a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario. More recently, Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016) requires ARB to ensure that GHG emissions are reduced to at least 40 percent below the 1990 statewide GHG emissions limit no later than December 31, 2030.

AB 32 requires ARB and other state agencies to adopt regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. The goals of AB 32 are also being accomplished through a combination of policies, planning, direct regulations, market approaches, incentives, and voluntary efforts. The full implementation of AB 32 and SB 32 is expected to improve energy efficiency, expand the use of renewable energy resources, and result in cleaner transportation and reduced waste.

ARB's Climate Change Scoping Plan, which is required to be updated at least once every five years, describes its strategy for meeting the GHG limits. Its 2014 *Update* described the status of the various measures to reduce GHG emissions.⁴ Table 1 below shows a number of the programs that are in place or under development.

Table 1. AB 32-Related Programs and Initiatives to Reduce GHG Emissions.

Economic Activity	Program	
Large Industry, Electricity Generators, Fuel Distributors	Cap-and-Trade Regulation Energy Efficiency and Co-Benefits Audits for Large Industrial Sectors	
Transportation	Advanced Clean Cars Low Carbon Fuel Standard Regional Transportation-Related Greenhouse Gas Targets Vehicle Efficiency Measures Ship Electrification at Ports Cap-and-Trade	 Goods Movement Efficiency Measures Heavy-Duty Vehicle Emission Reduction Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Project High Speed Rail
Electricity and Natural Gas Use	Building Energy Efficiency Appliance Energy Efficiency Utility Energy Efficiency Solar Water Heating Combined Heat and Power Systems	 33 Percent Renewable Portfolio Standard Senate Bill 1, Million Solar Roofs Cap-and-Trade

⁴ The 2014 First Update to the AB 32 Scoping Plan, including Appendix B, can be found at the following URL: https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm.

Economic Activity	Program	
Water Production, Distribution, and Use	Water Use Efficiency Water Recycling Water System Energy Efficiency	Reuse Urban Runoff Renewable Energy Production
Green Buildings	State Green Building Initiative Green Building Standards Code	 "Beyond Code: Voluntary Programs at the Local Level" Greening Existing Buildings
Oil and Gas Extraction, Distribution, and Refining	 Oil and Gas Extraction GHG Emission Reduction GHG Emissions Reduction from Natural Gas Transmission and Distribution Cap-and-Trade 	 Refinery Flare Recovery Process measures, consultation with air districts on amendments to rules for existing leak detection and repair at industrial facilities, including methane leaks
Recycling and Waste Management	Landfill Methane Control Measure Increase the Efficiency of Landfill Methane Capture Mandatory Commercial Recycling	 Increase Production and Markets for Compost and Other Organics, Anaerobic/Aerobic Digestion Extended Producer Responsibility Environmentally Preferable Purchasing
Forestry	Sustainable Forest Target	
Controls on High Global Warming Potential Gases	Motor Vehicle Air-Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing SF ₆ Limits in Non-Utility and Non- Semiconductor Applications Reduction of Perfluorocarbons in Semiconductor Manufacturing	 Limit Use of Compounds with High Global Warming Potentials in Consumer Products Stationary Equipment Refrigerant Management Program SF₆ Lead Reduction Gas Insulated Switchgear

Initial Focus of AB 32 Impact and Benefit Analysis: Cap-and-Trade Program

Many of the AB 32-related GHG emission reduction programs should carry the benefit of reduced exposures to co-pollutants in affected neighborhoods. For example, energy efficiency in electrical power generation and other sectors brings reduced releases of combustion by-products; reduced gasoline use from vehicle efficiency brings lower exposure to a number of gasoline-related toxicants; and improved control of fugitive emissions from natural gas transmission and distribution can reduce benzene releases.

The breadth of activities being undertaken to reduce GHG emissions in California makes a full analysis in this first report of the overall AB 32 program infeasible given the one-year timeframe for conducting the analysis. OEHHA is therefore placing an initial focus on California's Cap-and-Trade Program. This program has been chosen as the initial focus for the following reasons:

- GHG emissions from facilities and sources that are regulated under the Cap-and-Trade Program constitute about 85 percent of the state's GHG emissions.⁵
- Facilities regulated under the Cap-and-Trade Program commonly emit toxic air
 pollutants in addition to GHGs, and the emissions of GHGs may correlate with toxic copollutants. Thus reductions or increases in GHGs may be accompanied by corresponding
 changes in toxicant emissions.
- Many of the facilities are also located in low-income communities with high non-white populations. An evaluation of this program is consistent with the directive's intent to examine impacts in disadvantaged communities.
- Substantial data describing emissions of GHGs and toxic air contaminants by the covered entities are available.

This initial analysis will become part of a larger ongoing effort to understand the co-benefits and impacts of California's GHG reduction programs. In future reports, OEHHA plans to expand the analysis to cover AB 32 programs in addition to the Cap-and-Trade Program.

The Cap-and-Trade Program

Upon initial implementation in 2012, the Cap-and-Trade Program covered large industrial facilities and electricity generators each annually emitting more than 25,000 metric tons of carbon dioxide equivalent (MTCO₂e).⁶ Distributors of transportation, natural gas, and other fuels were added to the program beginning in 2015. Presently the program covers about 450 entities.

Facilities in industrial sectors are annually allocated some free allowances to emit a portion of their GHG emissions. An allowance is a tradable permit to emit one metric ton of a CO₂-equivalent greenhouse gas emission (one MTCO₂e). Each allowance has a unique serial number to enable its tracking. The initial allocation of allowances for most industrial sectors was set at about 90 percent of average emissions, and was based on benchmarks that reward efficient facilities.⁷ A facility's allocation is generally based on its production levels and is updated annually. Utilities that distribute electricity and natural gas are given free allowances whose

⁵ Overview of ARB Emissions Trading Program available at URL: https://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf.

 $^{^6}$ Carbon dioxide (CO₂) is the primary GHG, but other chemical emissions have global warming potential, including methane (CH₄), black carbon, nitrous oxide (N₂O), and hydrofluorocarbons. Emissions of GHGs are reported as CO₂ equivalents, where emissions rates for GHGs other than CO₂ are adjusted by a multiplier. For example, the multipliers for methane and nitrous oxide are 21 and 310, respectively, indicating higher global warming potential on a mass basis (CO₂ = 1).

⁷ Overview of ARB Emissions Trading Program. Available at URL: https://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf.

value must be used to benefit ratepayers and reduce GHG emissions. Electrical distribution utilities also receive an allocation of about 90 percent of average emissions. The allocation for natural gas utilities is based on 2011 levels of natural gas supplied to non-covered entities.

The Cap-and-Trade Program regulations enable trading and limited banking of allowances, as well as obtaining a limited number of "offset" credits. An offset credit is equivalent to a reduction or increase in the removal of one MTCO $_2$ e. Offset projects are developed by third parties and have included projects to remove CO $_2$ from the atmosphere through forestry projects, control of livestock-related biogas emissions, and projects to reduce use of refrigerants. These projects may occur out-of-state.

Allowances and offset credits are together referred to as "compliance instruments." Regulated entities surrender compliance instruments equivalent to their total GHG emissions by established deadlines within specific compliance periods. Compliance instruments can be obtained from the entity's free allocation, purchase of allowances at auctions or reserve sales, purchase of offset credits, and transfer of allowances or offset credits between entities. Use of offset credits is limited to up to eight percent of a facility's compliance obligation. Every year, covered entities turn in allowances and offsets for at least 30 percent of previous year's emissions. 9

Under the program, the annual emissions budgets decline 2-3% annually, but emissions in any year can fluctuate somewhat due to banking of allowances and offsets. The "cap" is the sum of the emissions allowances plus the allowable offset in aggregate for the compliance period.

California's program is designed to be linked to other similar programs outside of the state. This linkage allows covered California entities to use compliance instruments from GHG trading systems outside of California (and vice versa). This linkage creates a larger program and increases the total emission reduction achieved. Since 2014, the state's program has been linked to the program in Québec, Canada.

The first auction of allowances occurred in November 2012. Compliance obligation began in January 2013. In 2015, the compliance obligation began for distributors of transportation fuels, natural gas, and other fuels.

⁸ The first compliance period was the years 2013 and 2014; the second and third compliance periods are 2015-2017 and 2018-2020, respectively.

 $^{^{9}}$ At the end of the compliance period, covered facilities must surrender all instruments to cover the remaining emissions, that is 100% of final year and 70% of earlier years.

III Facilities Subject to the Cap-and-Trade Program: Description and Proximity to Disadvantaged Communities

What Are the GHG Facilities?

The Cap-and-Trade Program has required compliance by sources of GHGs that emit more than 25,000 MTCO₂e per year since it began in 2012. These include facilities associated with electricity generation as well as large stationary sources of GHG emissions. Based on industrial classification, ARB has grouped the facilities into broad sectors for reporting purposes. These are: cement plants, cogeneration facilities, electricity generators, hydrogen plants, oil and gas production facilities, refineries, and "other combustion sources."

For the initial analysis here, OEHHA will continue to use these broad sectors to characterize possible differences in emissions of GHGs and air toxics.

In 2015, the Cap-and-Trade Program incorporated fuel suppliers. These are suppliers of petroleum products (including gasoline and diesel fuel), biomass-derived transportation fuels, natural gas (including operators of interstate and intrastate pipelines), liquefied natural gas, and liquefied petroleum gas. These entities are not included in the current analysis, in part because of how recently they have been included, but also because the emissions of GHGs and air toxics from these entities are distributed too widely to be included in the facility-based analysis conducted for this report. (However, refineries are a point source of emissions and the facility emissions resulting from the production of fuels are included in the analysis.) The current analysis focuses on facilities that produce more localized emissions. Furthermore, the sector representing electricity importers was also excluded from the present analysis.

Table 2 below shows industrial sectors included in the Cap-and-Trade Program, and the amount of GHGs emitted in 2014. ¹⁰ The largest contributors are from electricity generation and petroleum and gas refining, which together account for over half of the localized GHG generation covered by the Program (emitter covered emissions). On a facility basis, refineries also dominate, with average facility levels of 1.7 million MTCO₂e. However, within all but one sector, there is at least one facility producing more than 1 million MTCO₂e.

¹⁰ Data available pursuant to California's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions at URL: https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

Table 2. GHG Emissions in 2014 by Cap-and-Trade Program Industry Sector for Facilities Reporting Emissions (Emitter-Covered Emissions in MTCO₂e).

Sector	No. Facilities / Entities	Total MTCO₂e by Sector	Range of MTCO ₂ e per Facility	Median MTCO₂e per Facility	Mean MTCO₂e per Facility
Cement Plant	9	7,653,163	123 – 1,968,656	935,061	850,351
Cogeneration	48	10,510,133	14,515 – 1,397,718	118,818	218,961
Electricity Generation	81	34,523,656	16 – 2,501,899	133,550	426,218
Hydrogen Plant	7	3,291,235	38,815 – 839,224	615,058	470,176
Oil and Gas Production ^a	50	16,256,368	13,155 – 3,246,254	44,572	325,127
Refinery ^b	18	31,266,353	3 – 6,363,590	1,112,508	1,737,020
Other Combustion Source c	116	8,326,559	747 – 1,412,648	44,534	71,781
Total	329	111,827,467			

^a Includes eight facilities that also supply natural gas, natural gas liquids, or liquefied petroleum gas.

What Are the Sources of Emissions from GHG Facilities Covered by the Cap-and-Trade Program?

The Cap-and-Trade Program covers several hundred industrial facilities that represent a wide variety of processes and activities. As a result of these activities, GHGs as well as other pollutants are commonly released into the atmosphere.

Table 3 below describes the facility sectors that report GHG emissions under the Cap-and-Trade Program and some of the processes used within these sectors that generate both GHGs and emissions of air toxics. In most sectors, the combustion of fuel is an important contributor to both GHG and air toxics emissions. For some sectors, GHGs are generated from processes other than fuel combustion (for example, CO₂ generated from the production of clinker in the manufacture of cement or CO₂ released from the production of hydrogen gas in the steam reformation process). Nearly all processes also generate air toxics. Criteria air pollutants and toxic air contaminants can be generated by non-combustion processes that may not be related to GHG emissions.

 $^{^{\}rm b}$ Includes 15 facilities that also supply transportation fuel or CO2, and/or operate a hydrogen plant.

^c Includes one facility that also supplies CO₂.

Table 3. GHG- and Air Toxic-Generating Activities and Processes in Primary Sectors of GHG Facilities Covered by the Cap-and-Trade Program (based on 2014 Inventory of Facilities).

Sector	Activities	Processes	Main Processes Generating CO ₂ e and Air Toxics
Cement Plants	Production of cement from limestone, clay and sand.	The mixture of limestone, clay, and sand is heated at high temperatures in a kiln to form clinker. Clinker is cooled and ground with various additives to produce cement. Key steps: 1. Raw materials acquisition and handling 2. Kiln feed preparation 3. Pyro-processing (calcining) 4. Finished cement grinding Most cement plants use short kilns with preheaters and pre-calciners for pyro-processing in clinker production. Some use long dry kilns without preheaters.	Pyro-processing (calcining) Fuel combustion (frequently coal)
Cogeneration Facilities	Generation of electrical power and useful heat, including waste heat recovery, from the same original fuel energy. Also known as combined heat and power.	Electricity and thermal energy are generated onsite at cogeneration facilities, where waste heat recovery also occurs. Some examples of cogeneration include: 1. Gas or other fuel combustion, sometimes to heat water to produce steam. 2. Gas or steam turbine to generate electricity 3. Exhaust energy convert to steam, exported to a host facility	Fuel combustion (fossil fuels or biomass)
Electricity Generation Facilities	Generating electrical power	Gas turbine: fuel combustion to generate electricity Boiler: to capture exhaust heat to make steam Steam turbine: to produce additional electricity	Fuel combustion (fossil fuels or biomass) Fugitive emissions
Hydrogen Plants	Producing hydrogen from feedstock for refineries, food industries, and fertilizer production	Steam methane reforming (SMR) method (for example): 1. Feedstock hydrogenation and sulfur removal 2. Reforming in the SMR 3. Shift conversion 4. Hydrogen purification	Fuel combustion Feedstock consumption ¹¹ All steps

¹¹ Produces mainly CO₂.

Sector	Activities	Processes	Main Processes Generating CO₂e and Air Toxics
Oil and Gas Production Facilities	Extraction of crude petroleum and natural gas from geological formations. May include well stimulation such as thermal (steam), waterflood, or gas injection techniques	1. Extraction of oil/water emulsion from the geological formation via a mechanical or submergible pump 2. Separation of emulsion into water, oil, and gas 3. Storage and transfer or oil and water; processing of natural gas for sale or use	Fuel combustion (frequently natural gas for steam generation) Fugitive emissions Flaring Dehydration processes
Refineries	Production of petroleum products, including transportation fuels (gasoline diesel), asphalt, and other products (kerosene, liquefied petroleum gas, feedstock for production of other materials)	Refineries can vary in the complexity of their processes. Topping refineries have small throughput, primarily separating crude oil into intermediates or simple products (e.g., asphalt). Hydro-skimming facilities include reforming and desulfurization process units as well as topping activity. More complex facilities produce transportation fuels and other products, and tend to use more energy, using processes including distillation, reforming, hydrocracking, catalytic cracking, coking, alkylation, blending, isomerization, amine treating, mercaptan oxidation. Many refineries have on-site hydrogen production, calciners, and sulfuric acid plants. Heavy crude oil inputs and production of lighter/cleaner products require more energy.	Combustion of refinery gas, syngas, and petroleum coke Fuel combustion for distillation Hydro-treating Catalytic reforming Sulfur removal Hydrogen generation
Other Combustion Sources	Multiple	Numerous industries are represented by facilities identified under the "other combustion source" sector. Facilities include those that manufacture nitrogenous fertilizer, alcoholic beverages, food and dairy products, paper and paperboard, gypsum products, soda ash, glass and glass containers, milling of iron and steel and rolled steel shapes, forging, lime, and mineral wool. Industrial activities can include canning, secondary smelting, and poultry processing. GHG emissions from colleges, universities, and professional schools are also included in this category.	Industry-dependent

Where Are GHG Facilities?

OEHHA has analyzed the location of 281 GHG facilities covered by the Cap-and-Trade Program for which street addresses could be geocoded from a 2014 inventory of facilities ¹². In this case, the distance from each GHG facility to the nearest SB 535 disadvantaged community was evaluated. Facilities were grouped by industrial sector to determine whether some sectors were more likely to be in or near disadvantaged communities. Facility locations are shown in Figure 2 below. The analysis of the percent of each sector's facilities in or within specific distances of disadvantaged communities is presented in Table 4 below. Since disadvantaged communities represent 25% of the census tracts in the state, Table 4 shows that GHG facilities are disproportionately located within disadvantaged communities for all sectors. Over 50% of facilities for all but the cogeneration sector fall within one-half mile of a disadvantaged community.

¹² Because oil and gas production facilities can cover large geographic areas, the proximity analysis to disadvantaged communities will require more in-depth spatial analysis. For this reason, 48 oil and gas production facilities with geocoded street addresses are not included in this analysis.

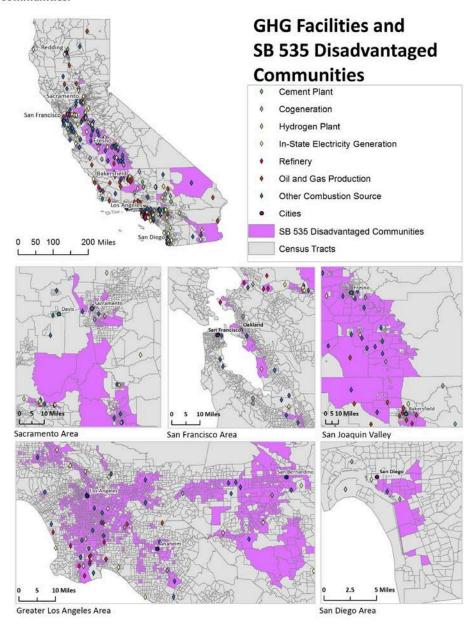


Figure 2. California Map Showing the Locations of GHG Facilities and SB 535 Disadvantaged Communities.

Table 4. Analysis of Proximity of GHG Facilities to SB 535 Disadvantaged Communities (Based on Geocoding by Facility Street Addresses).

	No. Facilities	% of Facilities in or near SB 535 DACs		
Sector		Within	<0.5 mi	<1.0 mi
Cement Plant	9	33	56	56
Cogeneration	59	29	41	42
Electricity Generation	76	41	51	58
Hydrogen Plant	7	43	71	86
Refinery	20	65	75	85
Other Combustion Source	110	56	65	66
Total	281	46	57	60

The SB 535 disadvantaged communities include about 15.5% of California's land area. With the additional 0.5 and 1.0 mile buffers, the land area represents 16.9 and 18.1% of California's land area, respectively. The total land area in California is estimated at 155,779 square miles. Greater buffer distances represent cumulative percent of facilities within a given distance. Facilities are treated here as points. Since many facilities cover large areas (footprint), the proximity to disadvantaged communities may be underestimated in this analysis.

In total, 46 percent of the GHG facilities covered by the Cap-and-Trade Program were located within SB 535 disadvantaged communities, 57 percent were in or within 0.5 miles of one, and 60 percent were in or within one mile of an SB 535 community. Generally, the sectors with the greatest likelihood of having a facility in or near an SB 535 disadvantaged community were from the sectors for refineries, hydrogen plants, and "other combustion source" sectors. Since the majority of GHG facilities are in close proximity to SB 535 disadvantaged communities, changes in emissions generally represent potential for differential increases or decreases in exposure in these communities.

These results are consistent with a recent report from academic researchers that examined the locations of many of the GHG facilities covered under the Cap-and-Trade Program. Cushing *et al.* (2016)¹³ describe a geographic analysis of 321 facilities that reported GHG emissions that were covered by the Cap-and-Trade Program during the 2013-2014 compliance period. And of these, 255 were within 2.5 miles of a resident population. Areas in proximity to these facilities

¹³ Cushing LJ, Wander M, Morello-Frosch R, Pastor M, Zhu A, Sadd J (2016). A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program. Research Brief – September 2016. UC, Berkeley, University of Southern California, San Francisco State University, and Occidental College. Available at URL: http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade.

were examined with respect to CalEnviroScreen 2.0 scores (highest 10 and 20% of scores) as well as the percentages of people of color and living in poverty.

The analysis found that census block groups within 2.5 miles of the GHG facilities had higher mean non-white populations, higher mean poverty levels, and a higher likelihood of being in a high-scoring CalEnviroScreen 2.0 census tract compared to block groups farther from GHG facilities. Many block groups are also within 2.5 miles of more than one facility. As the number of facilities near block groups increases, communities tend to have higher populations of color and higher rates of poverty.

IV Proposed Analytic Approach to Characterize Benefits and Impacts

Key Questions

The overall analysis of Cap-and-Trade facilities aims to answer the following key questions, in due course:

- How do emissions of GHGs relate to emissions of toxic air contaminants and criteria air
 pollutants from the same GHG facilities? Since the Cap-and-Trade Program aims to
 reduce aggregate GHG emissions, understanding how reductions or increases in GHG
 emissions may relate to changes in emissions of toxic air pollutants that could result in
 human exposure is critical to analyzing potential benefits and impacts.
- Are emissions disproportionately occurring in SB 535 disadvantaged communities? Do disadvantaged communities benefit from or are they negatively impacted by changes in emissions from GHG facilities subject to Cap-and-Trade? The SB 535 communities face burdens from multiple sources of pollution and population vulnerability factors. Equity analyses will address whether changes are occurring that may disproportionately affect these communities.
- Are the benefits and impacts due to the design of the Cap-and-Trade Program? The
 directive seeks to analyze benefits and impacts attributable to the AB 32 program.
 Therefore, an ultimate goal of the analyses will be to understand what changes in
 emissions can be attributed to responses to the program rather than external factors,
 such as economic conditions and drought.

Challenges in Evaluating the Benefits and Impacts of the Cap-and-Trade Program

The ability to examine relationships between Cap-and-Trade Program activities, outputs, and outcomes/impacts is complicated by a number of factors. These include:

The diversity of industries and facilities covered by the program. Uniformity is not
expected in how industries are able or likely to achieve compliance with the Cap-and-

Trade Program. The types and amounts of GHG and air toxics emissions that result from changes in industrial activities to comply with Cap-and-Trade are also expected to vary. Thus, the relationships between GHG and co-pollutant emissions vary across different industrial sectors (and even within facilities within a sector) with the differences in fuel types and sources, industrial processes and chemical feedstocks. For example, certain industrial processes may require fuels that burn at high temperatures. The emissions profile (specific chemicals emitted and levels at which they are emitted) typically varies with the temperature of combustion. Alternative fuels can also have different emissions profiles from conventional fuels.

• The limited availability of data about GHG program activities, associated emissions, and health and other outcomes. Some information regarding program activities is limited due to the need to protect confidential business information and market sensitivity of the information. This information could inform analyses of the relationship between GHG and co-pollutant emissions and facilities. Possible examples of such information include the mix and quantity of products made at specific facilities, and emissions produced per unit of product manufactured at a facility. However, such information may potentially provide economic advantage to competitors if made publicly available.

Other limitations in data are that information relevant to the analysis of outcomes — especially co-pollutants — has not to date been required to be co-reported with GHG emissions. As a result, these data must be obtained from sources resulting from other federal, state and local regulatory programs, such as permitting and reporting requirements and emissions monitoring by local air districts. Differences in reporting requirements across regulatory programs can complicate the analysis. Optimally, this analysis would have data reporting for co-pollutants and GHG emissions within the same time period, and over time. Changes in data collection practices can make it difficult to establish relationships between activities and outcomes over time.

- The flexibility of the Cap-and-Trade Program. The program has a number of
 components, including the aggregated nature of the GHG emissions cap and provisions
 to minimize "leakage" in which economic/industrial activity may move out of state.
 Facilities are also provided with numerous options for how compliance can be achieved,
 including "banking" of compliance instruments to provide flexibility while the program
 overall still meets the goals of GHG emission reductions. Also, the phase-in of different
 industrial sectors has occurred in different years.
- Confounding factors that affect emissions and related outcomes that are unrelated to
 the Cap-and-Trade Program. As one important example, industrial activity in California is
 affected by the overall economy and market factors, and may also be affected by other
 state, regional, or local regulatory activity. This can influence levels of GHG and air toxics

emissions. For example, the US and California experienced a severe economic recession from the late 2000s into the early 2010s, followed by an economic recovery, which occurred in the same period over which the Cap-and-Trade Program was launched and has developed. Another example includes the recent and persistent California drought. Because a large fraction of the state's electricity supply is derived from hydropower, the recent drought has necessitated additional generation of electricity from thermal power plants. Further, during the analysis period, the San Onofre Generating Station (a large nuclear power plant) was decommissioned. This resulted in more in-state emissions than would otherwise have occurred due to electricity generation from thermal power plants.

Practical Steps for Initial Analysis

Limitations to the readily available data place some constraints on the initial analysis described here. More public data are available to describe potential overall changes in pollutant emissions in disadvantaged communities than are available to specifically characterize Cap-and-Trade Program activities that may be influencing those emissions changes (see Section V below). For this reason, OEHHA is first examining the emissions data, and later intends to identify potential regulatory activities that may be contributing to changes in emissions, especially in disadvantaged communities. This report focuses on identifying and describing relevant data sources and how they can be used, gathers readily available data, and presents initial findings regarding those data.

Data Used to Characterize Emissions of GHG and Air Toxics Emissions from GHG Facilities

Various types of information are collected by state and federal agencies on emissions of GHGs and toxic air pollutants from facilities and other entities covered by the Cap-and-Trade Program. Below are the sources of information that provided emissions data for the analysis of impacts and benefits of California's Cap-and-Trade Program described in this report.

Mandatory Reporting of Greenhouse Gas Emissions

GHG emissions must be reported to ARB annually by many industrial sources, fuel suppliers, and electricity importers under the Mandatory Reporting Rule (MRR). ¹⁴ Of these

¹⁴ More detailed information on Mandatory Greenhouse Gas Emissions Reporting is available from ARB's website at URL: https://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.

facilities/entities, many are also subject to the Cap-and-Trade Program. For such facilities, the submitted emissions data are verified by an accredited third party. The table below describes some of the publicly available data through the MRR.

Table 5. Partial List of Information Available from Mandatory Greenhouse Gas Emissions Reporting.

Source of Information	Description of Available Data			
Facility Data	Facility name, ARB identification code, ZIP Code/city, industrial sector, industrial classification code (NAICS)			
Total Emissions	 Total CO₂e from combustion, process, vented, and supplier (in MTCO₂e); includes both fossil and biomass-derived fuels 			
Facility Reported GHG Data (in MTCO₂e)	 CO₂e from non-biogenic sources and CH₄ and N₂O from biogenic fuels ¹⁵ as emitters and fuel suppliers CO₂e from biogenic fuels as emitters and fuel suppliers Electricity importer CO₂e 			
ARB Calculated Covered Emissions (in MTCO₂e)	 Covered emissions as emitters, fuel suppliers, and electricity importers Total covered emissions (combined for entities with multiple) Total non-covered emissions 			

ARB has publicly provided information on GHG emissions for each year since 2008. However, emissions data for the years 2008 to 2010 are not directly comparable to later years. This is a result of changes in methodology to harmonize with U.S. EPA's GHG reporting regulation. An additional industrial sector has also been brought into the program since GHG reporting began, namely fuel distributors.

In 2015, GHG emissions data were reported for over 800 facilities, 724 of which reported GHG emissions greater than zero. The number of facilities in sectors expected to have on-site emissions was 589 (excluding electricity importers and suppliers of natural gas and transportation fuel). Not all facilities that report GHG emissions under the MRR are required to participate in the Cap-and-Trade Program.

¹⁵ Biomass fuels are derived from biomass products and byproducts, wastes, and residues from plants, animals, and microorganisms. Emissions from combustion of biomass fuels that meet certain criteria are considered biogenic and are exempt from a compliance obligation in the Cap-and-Trade regulations.

ARB also provides data related to how each entity covered by the Cap-and-Trade regulation meets it compliance obligation in terms of the total number of allowances and offsets surrendered each year. 16

Table 6. Information Available in the Annual Compliance Report for the Cap-and-Trade Program (ARB).

Type of Information	Description of Available Data		
Facility information	Facility name and ARB identification number		
Compliance Instrument Data	 2013-2014 triennial surrender obligation Total instruments surrendered Total allowances surrendered Offsets surrendered and the types of offset credits and specific offset projects those credits are from Compliance status ("fulfilled" or "unfulfilled") 		

The Cap-and-Trade Program has established definitions of "facility" that clarify the extent of facilities operations that are required to report as a single entity. These definitions are provided in Appendix A.

Air Toxics "Hot Spots" Emission Inventory

Information on emissions of toxic substances from facilities in California is available from the Air Toxics "Hot Spots" Emissions Inventory. Emissions inventory plans are intended to provide "a comprehensive characterization of the full range of hazardous materials that are released, or that may be released, to the surrounding air from the facility" and includes all continuous, intermittent, and predictable air releases (Health and Safety Code section 44340(c)(2)). The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code section 44300-44394, as amended) requires reporting of site-specific emissions of toxic substances based on criteria and guidelines adopted by ARB. ¹⁷ These guidelines outline:

The facilities that are subject to reporting. Generally, any facility¹⁸ or business in
California that emits more than 10 tons per year of organic gases, particulate pollution,
nitrogen oxides, or sulfur oxides, is subject to "Hot Spots" requirements. Certain smaller

¹⁶ This information is made available through ARB's website at URL: https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm (see Publicly Available Market Information).
¹⁷ AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation (Guidelines). The current regulation and a detailed description of the guidelines are available on ARB's website at https://www.arb.ca.gov/ab2588/2588guid.htm#current.

¹⁸ See Appendix A for definition of "facility" under this program.

facilities like gas stations, dry cleaners, and chrome platers are also subject to the requirements. Some "low level" facilities are exempt from further update reporting unless specified reinstatement criteria are met. Reductions in emissions from changes in activities or operations may also exempt some facilities from further reporting requirements. Facilities that have been exempted from compliance with this program may also be reinstated under certain conditions (for example, emissions of a newly listed substance, the establishment of a nearby sensitive receptor such as a school, or an increase in the potency of a substance that it emits).

- The groups of substances to be inventoried. Different chemical substances have different reporting requirements. Emissions must be quantified for over 500 specific substances.
 Production, use, or other presence must be reported for an additional ~200 substances.
 Facilities must report whether they manufacture an additional ~120 substances.
- When facilities are required to report. This is based on prioritization scores, risk
 assessment results, or de minimis thresholds. Emissions inventories developed under
 the "Hot Spots" Program are updated every four years.
- The information a facility operator must include in a facility's update to their emission inventory.
- Criteria by which "Hot Spots" reporting is integrated with other air district programs.
- The information that must be included in the air toxics emission inventory plan and report by a facility operator.
- The source testing requirements, acceptable emission estimation methods, and reporting formats.

Criteria Air Pollutant Emissions

Emissions data for criteria air pollutants from California facilities are collected by county or regional air districts as a result of both state and federal laws. The district data are then reported to ARB. Generally, large facilities report these emissions annually, though facilities with lower rates of emissions may only be required to report every three years.

Data on the emissions of criteria air pollutants for some facilities that are subject to the Capand-Trade regulation have recently been made available on ARB's Integrated Emissions Visualization Tool. ¹⁹ This includes data by facility for the years 2008 to 2014 on emissions of

¹⁹ Available at URL: https://www.arb.ca.gov/ei/tools/ievt/. For additional information comparing the reporting of GHG and criteria air pollutant emissions, see also URL: https://www.arb.ca.gov/ei/tools/ievt/doc/ievt_notes.pdf.

ozone-producing volatile organic compounds (VOCs), nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM 2.5 and PM10), and ammonia (NH₃).

Toxic Release Inventory (TRI; US Environmental Protection Agency)

Another source of emissions data for toxic substances is the US Environmental Protection Agency's (US EPA) Toxic Release Inventory (TRI).²⁰ Under this program, facilities²¹ in certain industrial categories with more than 10 full-time equivalent employees that manufacture, process, or otherwise use chemicals are required to report chemical emissions. Industries covered include certain electric power utilities, chemical manufacturing, mining, hazardous waste treatment, and federal facilities.

The list of chemicals for which reporting is required currently contains almost 600 individual chemicals, plus 31 chemical categories. Facilities are required to report emissions that manufacture or process more than 25,000 pounds, or otherwise use more than 10,000 pounds of any listed chemical in the course of a calendar year. Lower thresholds are in place for facilities that manufacture, process, or use certain persistent bioaccumulative toxic (PBT) chemicals.

For industries and facilities required to report, the minimum amounts that must be reported are on the order of 0.1 to 1 pounds per year. Reporting levels for PBT chemicals have no minimum levels. For qualifying facilities, reporting occurs annually.

General Limitations to the Use of Emissions Data as an Indicator of Benefits and Impacts

Emissions data are being used in this report as a proxy for potential exposures to air pollutants that arise from industrial sources, and do not directly correspond to health risks to individuals in communities near facilities. Health risks are typically estimated through health risk assessments of the facilities themselves. Such assessments can take into account a large number of factors, such as: the specific location of the emissions, the fate and transport of the substances emitted (in consideration of stack height, meteorology and terrain), the estimated concentrations of chemicals where people are, the duration of exposures, and the toxicity characteristics of the substances informed by health guidance values (such as cancer potencies and reference exposure levels). However, for an initial screen of potential concerns related to emissions of toxic air pollutants, emissions data provides information to use as a basis for

²⁰ Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA, or Title III of the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499). Additional information available through U.S. EPA's website at URL: https://www.epa.gov/toxics-release-inventory-tri-program.
²¹ See Appendix A for definition of "facility" under this program.

relative comparison (changes in emissions) and can illuminate the nature of potential hazards arising from facilities.

To address variations in the toxicity of the emitted chemicals, this report performs a toxicity weighting of the emitted chemicals. This weighting puts a greater emphasis on the more highly toxic emitted chemicals than on emitted chemicals with relatively low toxicity.

There are uncertainties associated with emissions data themselves. While the emissions reporting described below is required by law under different statutes, the amounts and types of emissions are self-reported by the regulated industries. This means they may be subject to some reporting errors. Different regulatory programs have different practices in place to verify submitted data, though there may be inaccuracies that are difficult to identify. Reporting requirements can change over time to include additional types of emissions and emission processes. Factors that are used to estimate emissions from specific processes can also be revised over time, leading to changes in the estimates.

VI Toxicity of GHGs and other Air Pollutants

Greenhouse Gases

There is generally low concern for human health from localized emissions of carbon dioxide (CO_2) , the primary GHG that is driving climate change. Only at very high concentrations does CO_2 affect human health. For this reason, emissions of CO_2 itself are not considered to be contributing to localized impacts from facilities where it is emitted.

Other GHGs are the "short-lived climate pollutants" including methane, fluorinated gases, and black carbon. Methane is more potent than CO₂ as a GHG, but is generally emitted at lower rates than CO₂. Sources of methane include agriculture, the oil and gas industry, and from the treatment of waste. Methane is generally not expected to have health effects from localized emissions due to its low toxicity.

Fluorinated gases include chlorofluorocarbons, hydrochlorofluorocarbons, and hydrofluorocarbons, many of which are being phased out of use because of their ozone-depleting potential. Most of the emissions of this class of compound arise from leakage of refrigeration systems. As such, they provide a relatively limited contribution to emissions from facilities regulated under the Cap-and-Trade Program. Similarly, sulfur hexafluoride has numerous uses, but is regulated from early actions outside of the Cap-and-Trade Program due to its very high global warming potential and increasing levels in recent years.

Black carbon is generally created as a product of incomplete combustion of organic fuels, including diesel fuels. Black carbon is a component of particulate pollution (including PM2.5,

see below) and diesel particulate matter, both of which have well-described human health toxicity concerns, including increasing risk of premature death and cancer. California has substantially reduced black carbon from diesel exhaust from many sources over the past 20 years, corresponding to a 13% reduction in the total annual CO_2 emissions in California.

Criteria Air Pollutants

The criteria air pollutants are common air pollutants for which federal standards are established under the Clean Air Act (42 U.S. Code Chapter 85). The six criteria air pollutants are ozone, particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. California has established more protective standards in some cases. The standards are established to protect even the most sensitive individuals, such as children and elderly. Some of the common sources of exposure and key health effects are described in Table 7 below.

Table 7. Sources of Exposure and Health Effects of Criteria Air Pollutants.

Criteria Air Pollutant	Sources of Exposure	Health Effects
Ozone	Generated from interaction of sunlight with volatile organic compounds (reactive organic gases), especially hydrocarbons, and nitrogen oxides; ozone formation may be distant from the source of these emissions. Sources include vehicles, industrial facilities, and consumer products, among others.	Damage to the respiratory tract; worsening of symptoms for respiratory diseases like asthma, bronchitis, and emphysema; reduction in lung function; increased susceptibility to infections. People who spend more time outdoors may be especially susceptible.
Particulate matter (PM)	Many sources of PM; generated by the combustion of most fuels, which produces most of fine PM (particles less than 2.5 microns in diameter, PM2.5); larger particles (PM10) can be generated by blowing dusts. Particles can vary greatly in their composition.	Worsening of heart and lung disease; decreases in lung function and respiratory symptoms, such as coughing or shortness of breath; increases in hospitalizations and deaths. People with heart and lung disease, as well as children and elderly, may be especially susceptible to the effects.

Criteria Air Pollutant	Sources of Exposure	Health Effects
Sulfur dioxide	Combustion of fuel containing sulfur. Industrial sources include certain petroleum refining processes. Other sources are locomotives, ships, and certain diesel equipment.	Respiratory effects include shortness of breath and wheezing. Increases in mortality have been observed from sulfur dioxide exposure. Children, elderly, asthmatics, and people with existing heart disease may be especially sensitive to the effects.
Nitrogen dioxide	Combustion of fuel by cars, trucks, and at power plants.	Damage to the respiratory tract. Asthmatics may be especially susceptible to the harmful effects of nitrogen dioxide exposures.
Carbon monoxide	Produced from the incomplete combustion of fuels from a variety of sources.	Dizziness and confusion at high levels of exposure, though unlikely outdoors. Individuals with heart or lung disease may be especially susceptible.
Lead	Multiple sources, especially processing of metals, waste incineration, battery manufacturing, and aircraft burning leaded aviation fuel.	Harmful to the nervous, cardiovascular, immune, reproductive and developmental systems. Children are especially sensitive to the effects of lead.

Toxic Air Contaminants

"Toxic air contaminants" are defined in California law as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health (Health and Safety Code section 39655). There are currently almost 200 substances or groups of substances identified as toxic air contaminants by ARB. ²² These substances show a wide range of toxicity characteristics and physical properties that could influence the likelihood of health effects if they are emitted to air. ²³

²² The current list can be found on the ARB website at URL: https://www.arb.ca.gov/toxics/quickref.htm#TAC.

²³ Information on the types of hazards for many identified toxic air contaminants is available at URL: https://www.arb.ca.gov/toxics/cattable.htm.

Some toxic air contaminants were listed because they were federally designated hazardous air pollutant (pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)). ARB designated others based on evaluations performed by OEHHA that meets specific criteria described in California law (Health and Safety Code section 39660).

VII Results

Toxicity-Weighted Emissions to Air

Most GHG facilities covered by the Cap-and-Trade Program emit a combination of GHGs, criteria air pollutants, and toxic air contaminants. While GHGs themselves tend to be relatively less toxic, co-pollutants that are emitted can vary significantly by facility with respect to their composition and potential toxicity. To provide additional information on how these facilities vary with respect to overall toxicity of emissions, OEHHA derived a "toxicity-weighted" emissions score for each of the facilities for which emissions data were available. The purpose of this analysis was to screen for higher-concern facilities with respect to emission levels and potential chemical toxicity.

The data were derived from the California Air Toxics "Hot Spots" Emissions Inventory for GHG facilities that could be matched across both the "Hot Spots" and Cap-and-Trade Programs. This matching was performed by investigators from UC Berkeley and San Francisco State University. The facility matching involved geocoding facility addresses that were available for each Cap-and-Trade Program GHG facility. The location information was then matched to location information for "Hot Spots" facilities that was made available by ARB. Facilities with close proximity to a listed address and similar facility names were presumed to match. Comparable identities were confirmed by visual inspection of satellite imagery and internet research. In developing this facility data set, some facility locations were adjusted so that they more closely spatially aligned with likely point sources of emissions.

There are several uncertainties associated with the matching of Cap-and-Trade and "Hot Spots" facilities due to the differences between the two regulatory programs. These uncertainties come from differences in how facilities are defined under each program. In some cases, facilities may have multiple operations that are combined for the purpose of reporting GHG emissions. However, these operations may be reported separately for air toxics and criteria air pollutant emissions.

Of the full set of Cap-and-Trade covered facilities from sectors that were expected to produce localized emissions, a subset of 374 facilities were tentatively identified as likely matches to "Hot Spots" facilities. Emissions information for 365 of these facilities was provided to OEHHA by ARB for the 2014 reporting year. These data included annual emissions amounts for

individual criteria air pollutants (or their precursors for those with ozone-forming potential) and individual chemicals for which reporting is required under the "Hot Spots" Program. A smaller subset of 77 facilities had risk assessments prepared under the "Hot Spots" Program. In these cases, emissions were modeled to identify potential risks in neighboring communities. Since these data were somewhat limited in availability across Cap-and-Trade Program covered facilities, they are not currently being used in the analysis described here.

Because facilities emit multiple chemicals and not all chemicals are equally toxic, OEHHA applied weighting factors to the air toxics emissions data for each facility. OEHHA calculated a toxicity-weighted emissions score for each of the 365 facilities using an approach comparable to that used to calculated toxicity-weighted emissions under US EPA's Toxic Release Inventory Program. To apply a comparable methodology here, US EPA's Inhalation Toxicity Scores for individual chemicals were matched and applied to the chemical emissions levels for air toxics (pounds emitted per year) from each facility. ²⁴ Some chemicals whose emissions are required to be reported in the "Hot Spots" Program did not have US EPA toxicity weights available. These compounds are currently excluded from the analysis. Toxicity weights may be established for these compounds in the future.

Toxicity weight is described by US EPA as follows: 25

"This weight is a proportional numerical weight applied to a chemical based on its toxicity. The toxicity of a chemical is assessed using EPA-established standard methodologies. For each exposure route, chemicals are weighted based on their single, most sensitive adverse chronic human health effects (cancer or the most sensitive noncancer effect). In the absence of data, the toxicity weight for one pathway is adopted for the other pathway. The range of toxicity weights is approximately 0.02 to 1,400,000,000."

This type of weighting was also used in characterizing air toxics emissions in the California Communities Environmental Health Screening Tool (CalEnviroScreen). Toxicity weights do not include the criteria air pollutants (NO_x, PM2.5, etc.). Those pollutants are evaluated separately below.

²⁴ OEHHA used US EPA values here because they were readily available. Since California-specific risk and toxicity data may be available for many chemicals, these values will be updated for future analyses. As an example, US EPA does not include a toxicity weight for diesel exhaust, which can be an important contributor to cancer risk from facilities.

²⁵ Further information is available on U.S. EPA's website at URL: https://www.epa.gov/trinationalanalysis/hazard-and-risk-tri-chemicals-2014-tri-national-analysis.

As discussed above, the toxicity weights themselves for each compound are not a measure of risk or likelihood of harm, but provide a way to screen overall emissions from facilities that allows comparisons and the identification of those emissions of highest overall concern.

The emissions characteristics of facilities differ by industry. Using the information on emissions reported by facilities, the most frequently reported specific chemical emissions are described in Table 8 below. Across sectors, numerous air toxics are reported to be emitted that are commonly created by fuel combustion. These include formaldehyde, benzene, toluene, xylenes, 1,3-butadiene, diesel particulate matter, and polycyclic aromatic hydrocarbons (PAHs). The composition of chemicals emitted from fuel combustion depends on the type of fuel burned (oil, coal, natural gas, biomass). Other emissions are likely to be associated with a type of industry. For example, nearly all cement plants report emissions of nickel, naphthalene, lead, formaldehyde, hexavalent chromium, cadmium, beryllium, benzene, and arsenic. (One cement plant in this data set reported very low activity in 2014 with respect to both GHG and air toxics emissions.) Oil and gas production facilities emit numerous organic chemicals: benzene, formaldehyde, naphthalene, toluene, xylenes, acetaldehyde, PAHs, acrolein, ethylbenzene, and 1,3-butadiene.

Toxicity-weighted emissions values were calculated for each of the facilities for which air toxics emissions data were available, as described above. The highest-scoring 25 facilities are presented in Table 9 below. While multiple sectors are represented in this group, some sectors appear more frequently among those with the highest toxicity-weighted emissions. The highest-scoring 25 facilities in the state include several cement plants (6), refineries (6), and facilities associated with oil and gas production (6).

Table 8. Frequency of Specific Chemical Emissions for Facilities with Reported Air Toxics Emissions by Cap-and-Trade Sector (Criteria Air Pollutants Excluded).

Sector	Facilities*	Chemicals most fro	ed (number of	
Cement Plants	9	Nickel (8) Naphthalene (8) Lead (8) Formaldehyde (8) Hexavalent chromium & compounds (8) Cadmium (8) Beryllium (8) Benzene (8) Arsenic (8) Selenium (7)	Copper (7) Zinc (6) Xylenes (mixed) (6) Toluene (6) Hydrochloric acid (6) Chromium (6) Benzo(a)pyrene (6) Acetaldehyde (6) 2,3,7,8-Tetrachlorodibenzopdioxin (6) 1,3-Butadiene (6)	Ethyl benzene (5) Dibenz(a,h)anthracene (5) Benzo(k)fluoranthene (5) Benzo(b)fluoranthene (5) Benz(a)anthracene (5) 2,3,7,8-Tetrachloro- dibenzofuran (5) 2,3,4,7,8-Pentachloro- dibenzofuran (5) 1,2,3,4,6,7,8-Heptachloro- dibenzo-p-dioxin (5)
		Mercury (7) Manganese (7)	Silica, crystalline (respirable) (5) Indeno(1,2,3-cd)pyrene (5)	1,2,3,4,6,7,8- Heptachlorodibenzofuran (5)

Sector	Facilities*	Chemicals most frequently reported emitted (number of occurrences) *			
Cogeneration Facilities	48	Formaldehyde (43) Benzene (43) Toluene (35)	Ammonia (34) Naphthalene (31) Acetaldehyde (29)	Xylenes (mixed) (27) Acrolein (26) 1,3-Butadiene (26)	
Electricity Generation Facilities	90	Formaldehyde (80) Benzene (80) Ammonia (71) Naphthalene (60)	1,3-Butadiene (50) Toluene (47) Arsenic (46) Nickel (45)	Lead (45) Cadmium (45) Hexavalent chromium & compounds (40) Xylenes (mixed) (39)	
Hydrogen Plants	6	Formaldehyde (6) Benzene (6)	Ammonia (5) PAHs, total (4)	Naphthalene (4)	
Oil and Gas Production Facilities	47	Benzene (40) Formaldehyde (38) Naphthalene (32)	Toluene (28) Xylenes (mixed) (25) Acetaldehyde (25)	PAHs, total (24) Acrolein (24)	
Refineries	20	Ammonia (19) Benzene (18) Formaldehyde (17) Nickel (16)	Lead (16) Hexavalent chromium & compounds (16) Cadmium (16) Naphthalene (15)	Arsenic (14) Beryllium (13) 1,3-Butadiene (13) PAHs, total (12)	

Sector	Facilities*	Chemicals most frequently reported emitted (number of occurrences) *				
Other	114	Numerous industrial activities are represented in the "Other Combustion Sources" category. A few examples are presented below.				
Combustion Sources		Fruit and Vegetable Canning Toluene (8) Formaldehyde (8) Benzene (8) Xylenes (mixed) (6) Propylene (6) Nitrous oxide (6) Naphthalene (6) Methane (6) Hexane (6) Ethyl benzene (6) Carbon dioxide (6) Acrolein (6) Acctaldehyde (6) PAHs, total (5) Ammonia (5) Diesel engine exhaust, particulate matter (Diesel PM) (4) Dry, Condensed, and Evaporated Dairy Product Manufacturing Diesel engine exhaust, particulate matter (Diesel PM) (5)	Propylene (4) PAHs, total (4) Nitrous oxide (4) Naphthalene (4) Methane (4) Hexane (4) Formaldehyde (4) Ethyl benzene (4) Carbon dioxide (4) Benzene (4) Acrolein (4) Acetaldehyde (4) Paperboard Mills Formaldehyde (3) Benzene (3) Toluene (2) Nickel (2) Naphthalene (2) Lead (2) Hexavalent chromium & compounds (2) Cadmium (2)	Arsenic (2) Ammonia (2) Acetaldehyde (2) Colleges, Universities, and Professional Schools Formaldehyde (8) Benzene (8) Nickel (7) Lead (7) Hexavalent chromium & compounds (7) Cadmium (7) Arsenic (7) Naphthalene (6) Mercury (6) Toluene (5) Methylene chloride (5) Manganese (5) 1,3-Butadiene (5) Xylenes (mixed) (4) Acrolein (4) Acetaldehyde (4)		
		Xylenes (mixed) (4) Toluene (4)				

^{*} Facility count is the number of facilities for which air toxics emissions data are available, but did not report emitter-covered GHG emissions in 2014.

Table 9. Twenty-Five Cap-and-Trade Facilities with the Highest Toxicity-Weighted Air Emissions.* Shaded Facilities Are In or Within ½ Mile of an SB 535 Census Tract.

Facility Name and Approximate Location	Sector	Tox-Weighted Air Emissions	CEIDARS ID	ARB ID
CalPortland Company, Mojave Plant, Mojave	Cement Plant	11,128,486,856	15_KER_9	101029
California Resources Elk Hills, LLC, 35R Gas Plant, Tupman	Oil & Gas Production, Supplier of NG/ NGL/ LPG	8,019,256,117	15_SJU_2234	104014
Riverside Cement Company, Oro Grande	Cement Plant	4,773,322,002	36_MOJ_1200003	100013
Cemex Construction Materials Pacific LLC, Victorville Plant	Cement Plant	3,981,635,547	36_MOJ_100005	101476
Lake Shore Mojave, LLC (Shutdown), Boron	Cogeneration	3,154,251,353	KER_593	100218
U.S. Borax, 93516, Boron	Other Combustion Source	3,154,251,353	15_KER_28	100300
PG&E Hinkley Compressor Station, Hinkley	Oil & Gas Production	2,695,090,703	36_MOJ_1500535	101290
Lehigh Southwest Cement Co., Tehachapi	Cement Plant	2,565,789,410	15_KER_20	101461
Mitsubishi Cement 2000, Lucerne Valley	Cement Plant	2,073,213,791	36_MOJ_11800001	101010
Shell Oil Products US, Martinez	Refinery, Hydrogen Plant	1,916,625,223	7_BA_11	100914
PG&E Topock Compressor Station, Needles	Oil & Gas Production	1,576,205,185	36_MOJ_1500039	101031
ExxonMobil Oil Corporation, Torrance Refinery Torrance	Refinery, Hydrogen Plant, CO ₂ Supplier	1,531,495,371	19_SC_800089	100217
Searles Valley Minerals Inc., Trona	Other Combustion Source	1,487,264,625	36_MOJ_900002	100011
Southern California Gas Co., South Needles Facility, Needles	Oil & Gas Production	1,401,623,408	36_MOJ_3100068	101346
Coso Power Developers (Navy II), Geothermal, Little Lake	In-State Electricity Generation	1,280,562,586	15_KER_328	101669
National Cement Company, Lebec	Cement Plant	1,151,169,990	15_KER_21	101314
Freeport-McMoRan Oil & Gas LLC, SJV Basin Facility, Fellows	Oil & Gas Production	1,090,450,784	15_SJU_1372	104081
Imerys Minerals California, Inc., Lompoc	Other Combustion Source	1,047,824,807	42_SB_12	101318
Grayson Power Plant, Glendale	In-State Electricity Generation	873,364,347	19_SC_800327	100181
Valero Refining Company, Refinery and Asphalt Plant, Benicia	Refinery, Hydrogen Plant, CO ₂ Supplier	830,573,455	48_BA_12626	100372
Tesoro Refining and Marketing Co., Martinez	Refinery, Hydrogen Plant, CO ₂ Supplier	786,966,781	7_BA_14628	101331
Southern California Gas Co - Aliso Canyon Facility, Northridge	Oil & Gas Production	716,224,953	19_SC_800128	101349
Spreckels Sugar Company, Inc., Brawley	Other Combustion Source	708,360,193	2014_13_IMP_10	101241
Chevron Products Company, El Segundo	Refinery, Hydrogen Plant, CO ₂ Supplier	697,864,142	2014_19_SC_800030	100138
Phillips 66 Company, Los Angeles Refinery, Wilmington	Refinery, Hydrogen Plant, CO ₂ Supplier	673,822,489	2014_19_SC_171107	100329

^{*}Top 25 of the 297 facilities for which scores could be calculated using 2014 emissions data.

Air Toxics and GHGs Emissions

Plotting data graphically for visual inspection and calculation of correlation coefficients are approaches to the evaluation of data that may be informative with respect to relationships between greenhouse gas emissions and toxic air contaminants.

The Pearson correlation coefficient is a measure of the linear dependence between two variables, in this case between GHG emissions and a number of different pollutant emission measures. A Pearson correlation coefficient is high when the relationship between two measures increases linearly in proportion to each other. Generally, high positive correlation produces a coefficient r-value of greater than 0.8, with moderately high correlation above 0.5, moderate when the measures are between 0.3 and 0.5, and low when below 0.3 to zero but statistically significant. Inversely correlated values are negative. The Pearson correlation is vulnerable to outlier data, especially when there is a large range of values represented in the analysis. For this reason, an additional correlation analysis was conducted using the Spearman correlation coefficient. In this analysis, the rank order of each of two sets of measures is compared. This coefficient is better able to identify data sets that may be related, but the relationship may be more complex than linear. Another method to address data over a larger range is to make logarithmic transformations. For several of the data sets here, logarithmically transforming the data strengthened the correlations.

Figure 3 shows a scatterplot of GHG emissions versus toxicity-weighted emissions from facilities for which both types of data are available. The GHG emissions used are emitter-covered emissions for the year 2014, excluding emissions by facilities that were not covered by the program (e.g., biomass) and emissions related to electricity imports that were not local. This analysis only included facilities with emitter-covered emissions for which 2014 air toxics data were available (n = 298). Overall, this correlation was moderate, positive and highly significant by both measures (Pearson coefficient, r = 0.32; Spearman coefficient, r = 0.44; both statistically significant, p<0.0001).

When facilities were subdivided by Cap-and-Trade Program industrial sectors, some sectors showed considerably higher positive relationships. The scatterplots and correlations are presented in Figure 4 and Table 10 below, respectively. Refineries overall showed high positive correlations ($r \cong 0.8$), followed by oil and gas production facilities, hydrogen plants, and cement plants, each of which were moderately correlated using the Pearson coefficient ($r \cong 0.5$). For refineries, GHG emissions were highly correlated with toxicity-weighted air toxics emissions, as indicated by both the Pearson (0.82) and Spearman (0.86) correlation coefficient ($p \le 0.0001$ for both coefficients). The Pearson correlations for hydrogen and cement plants were also supported by positive correlations using the Spearman coefficient. For the oil and gas production facilities, both measures showed positive correlation, but only the Pearson was

statistically significant, suggesting that outliers or extreme values may have contributed to the Pearson correlation. It is also likely that the nature of the relationship between emissions of GHGs and air toxics varies substantially across these types of facilities. Also, how these facilities are defined differs across the different regulatory programs (see Appendix A for the definitions). 26 For electricity generation facilities, GHG emissions and toxicity-weighted emissions also showed low correlation; however, emissions levels across facilities varied broadly and logarithmic transformation resulted in a moderate (Pearson r = 0.41) and a highly significant correlation (p<0.001).

²⁶ ARB provides additional information on the differences between oil and gas facilities under different programs. See URL: https://www.arb.ca.gov/ei/tools/ievt/doc/ievt_oil_gas_crosswalk.pdf. The crosswalk table described in this document was not used for the initial analysis performed by OEHHA in this report.

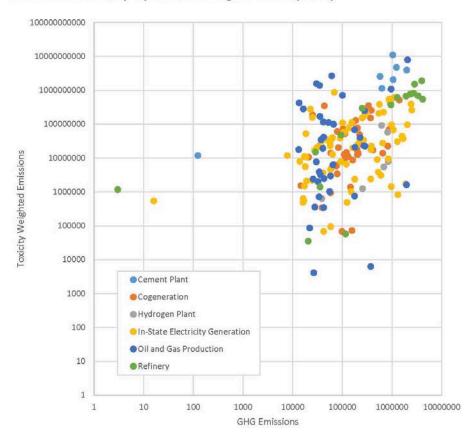


Figure 3. Scatterplot of Toxicity-Weighted Emissions vs GHG Emissions from GHG Facilities with Emissions Data, by Cap-and-Trade Program Sectors (n=201)*

^{*}The figure excludes "Other Combustion Sources" Category. GHG Emissions in MTCO $_2$ e. Plotted on a Logarithmic Scale).

Figure 4. Scatterplots of Toxicity-Weighted Emissions vs GHG Emissions (MTCO2e) by Capand-Trade Program Sectors (plotted on logarithmic scale).

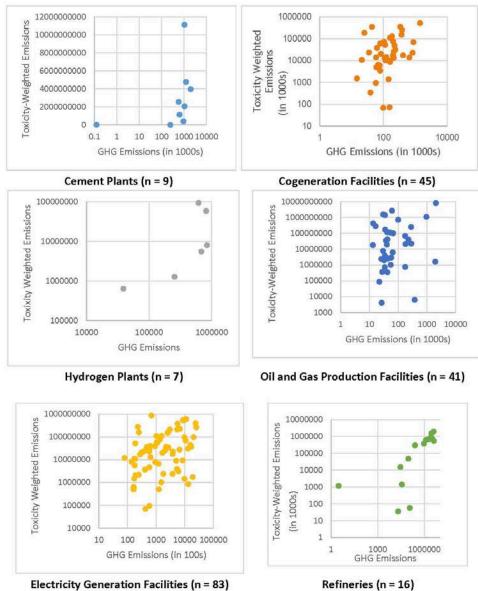


Table 10. Correlation for GHG Emissions vs. Toxicity-Weighted Air Toxics Emissions for Capand-Trade Facility by Sector (2014 Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05).

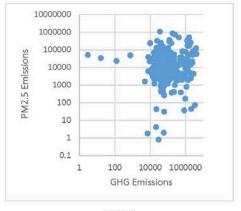
Sector	No.	Pearson	Stat. Sig.	Spearman	Stat. Sig.
		(r-value)	(p-value)	(r-value)	(p-value)
Cement Plants	9	0.474	0.198	0.733	0.025
Cogeneration	45	-0.004	0.979	0.243	0.108
Hydrogen Plants	7	0.481	0.274	0.714	0.071
Oil & Gas Production	41	0.555	0.0002	0.100	0.533
Electricity Generation	83	0.173	0.119	0.282	0.0098
Refineries	16	0.818	0.0001	0.862	<0.0001

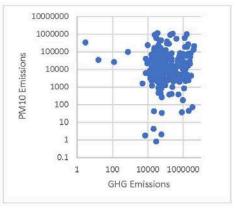
Criteria Air Pollutant and GHG Emissions

The relationships between GHG emissions and the emissions of specific criteria air pollutants from facilities were investigated in a manner similar to the analysis above using toxicity-weighted emissions. Figure 5 below show scatterplots of emissions of GHGs from facilities (as above) versus emissions of criteria air pollutants using data provided by ARB. Table 11 below shows the Pearson and Spearman correlation coefficients for each of the comparisons. This analysis includes facilities from all sectors for which data are available.

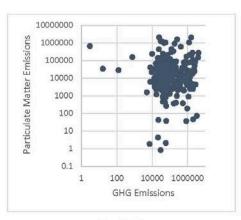
Because of the wide range of emissions of both GHGs and criteria air pollutants and the diverse nature of the industries analyzed here, the Spearman correlation likely provides more insight into probable relationships than the Pearson correlation. Here, Spearman correlations were moderately positive (r \cong 0.5) for total PM, PM10, PM2.5, SOx and NOx, individually. Correlations were poorer, though still positive, for organic and volatile gases (ozone-precursors), and carbon monoxide. Each of these correlations was statistically significant.

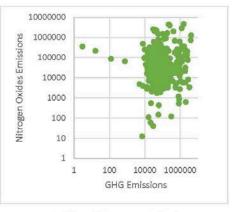
Figure 5. Scatterplots of Criteria Air Pollutant Emissions from All GHG Facilities with Emissions Data for the 2014 Reporting Year ($n \approx 316$; Criteria Air Pollutant Emissions vs. GHG Emitter-Covered Emissions in MTCO₂e).





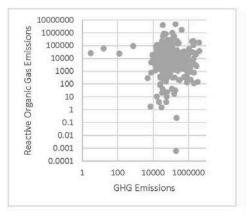
PM2.5 PM10

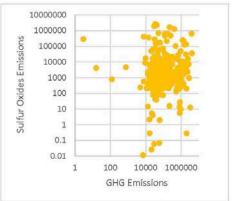




Total PM

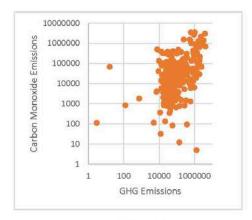
Oxides of Nitrogen (NOx)





Ozone-Generating Compounds (Reactive Organic Gases)

Oxides of Sulfur (SOx)



Carbon Monoxide

Table 11. Correlations between Emitter Covered GHG Emissions (in MTCO₂e) and Criteria Air Pollutant Emissions (in pounds) for All Cap-and-Trade Facilities with Emissions Data (2014 Data).

	Correlation	Correlation (r-value)*			
Pollutant	Pearson	Spearman			
со	0.451	0.394			
NOx	0.515	0.508			
SOx	0.460	0.564			
PM	0.467	0.455			
PM10	0.617	0.499			
PM2.5	0.718	0.554			
ROG	0.642	0.246			
TOG	0.693	0.389			
VOCs	0.652	0.246			

^{*} All correlation r-values for both tests were statistically significant (p<0.0001).

OEHHA also examined relationships between individual criteria air pollutants and GHG emissions by industrial sector. These correlations are presented in a table in the Appendix (p. A-3). For refineries and in-state electricity generation facilities, correlations were moderate to high. All were statistically significant (p<0.05). Other sectors with high correlations include cement plants (NOx, PM, PM10, and VOCs) and hydrogen plants (TOG, VOCs).

Case Study: Cement Plants

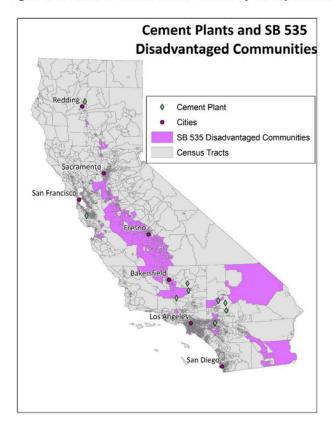
Cement manufacturing facilities were selected for a further analysis of the relationship between GHG emissions and emissions of toxic air contaminants. This sector was selected because (1) many of these facilities are among the highest scoring with respect to toxicity-weighted emissions to air (see Table 9) and (2) multi-year air toxics and criteria air pollutant emissions data are available from US EPA's Toxic Release Inventory (TRI) Program and ARB, respectively. While TRI data have not yet been broadly matched for each facility across all Capand-Trade facility sectors, TRI emissions data are available for the nine cement plants that are currently covered by the Cap-and-Trade Program. The nine facilities are listed in Table 12 below and shown on the map in Figure 6.

Table 12. California Cement Plants Evaluated for GHG and Air Toxics Emissions.

Facility Name	Approx. Location
CalPortland Co Colton Plant*	Colton
CalPortland Co Mojave Plant	Mojave
Cemex Construction Materials Pacific LLC	Victorville
Lehigh Southwest Cement Co Cupertino	Cupertino
Lehigh Southwest Cement Co Redding	Redding
Lehigh Southwest Cement Co Tehachapi	Tehachapi
Mitsubishi Cement Corp	Lucerne Valley
National Cement Co Of California Inc	Lebec
Riverside Cement Oro Grande Plant	Oro Grande

^{*}This facility ceased kilning operations in 2009; however, the plant retains grinding and distribution activities.

Figure 6. Location of Cement Plants Covered by the Cap-and-Trade Program.



The emissions data for these facilities were obtained for the years 2011-2014. GHG emissions were represented by those emissions that occurred locally and were covered by the Cap-and-Trade Program (emitter-covered emissions). TRI data obtained were toxicity-weighted emissions to air, as described above. Tsince US EPA provides a calculated toxicity-weighted score for each facility, it was not necessary to adapt any of the chemical-specific scores, as was done for the data that originated from California's "Hot Spots" Program. PM2.5 emissions data were obtained from ARB's CEIDARS (California Emission Inventory Development and Reporting System) data, which was downloaded from ARB's Integrated Emissions Visualization Tool.

Trends in emissions of both GHGs, air toxics, and PM2.5 are represented in Figure 7 below for each cement plant. One plant, CalPortland Colton, reported very low levels of GHGs and air toxics across all four years because it ceased kilning operations in 2009, though it continued to grind cement products. (This facility was excluded from the chart.) Across years within a given facility, there tended to be reasonable correlations in trends over time between GHG and toxicity-weighted emissions (for example, Cemex Construction Materials Pacific, Lehigh Southwest Cement Cupertino, Mitsubishi Cement, and Riverside Cement Oro Grande). Others showed poorer correlation (for example, CalPortland Mojave and National Cement). The pattern for National Cement is notable for a sudden increase in toxicity-weighted emissions in 2014. Further investigation of the specific chemical emissions data for this facility revealed that this increase was attributable to new reporting of chromium compound emissions in 2014, a departure from previous years. Since chromium emissions are generally consistently reported from cement plants, it is likely that the lack of chromium emissions for 2011-2013 is anomalous.

While year-over-year emissions at individual cement plants show some positive correlations, relative emissions of GHGs and toxicity-weighted air pollutants across facilities show fewer positive relationships. For example, Cemex Construction Materials Pacific had among the highest GHG emissions in this sector, while it was among the lower-scoring facilities for overall toxicity-weighted emissions, as reported to US EPA in their TRI program.

Although the observations from this specific industry are not directly applicable to other industries, this limited set of data suggests that year-over-year changes in GHGs within a facility are potentially meaningful in estimating changes in more toxic pollutants.

²⁷ TRI data were obtained through the TRI.NET tool available at URL: https://www.epa.gov/toxics-release-inventory-tri-program/download-trinet.

²⁸ Toxicity-weighted emissions from TRI are not directly comparable to those calculated from California "Hot Spots" emissions data. These are different regulatory programs with different reporting requirements.



Figure 7. Cement Plants: Emitter Covered Emissions of GHGs (MTCO2e, MRR Data) (Top), Toxicity-Weight Air Emissions (TRI Data) (Middle) and PM2.5 Emissions (in tons, CEIDARS Data) (Bottom) over the Years 2011-2014.

Pearson and Spearman correlation coefficients were calculated using 2014 data on emissions of GHGs, air toxics, and PM2.5 and are shown in Table 13. The 2014 data used to calculate the correlations is shown graphically in Figure 7. GHG emissions and toxicity-weighted air emissions (TRI data) were not found to be correlated. A significant relationship (Spearman $r \cong 0.786$, p-value = 0.0208) was observed between GHG emissions and PM2.5 emissions.

Table 13. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. Toxicity-Weighted Air Emissions (TRI Data) or PM2.5 Emissions (CEIDARS Data) for Eight Cement Plants

GHG Emissions vs	No.	Pearson (r-value)	Stat. Sig. (p-value)	Spearman (r-value)	Stat. Sig. (p-value)
Toxicity-weighted air emissions	8	0.097	0.82	0.405	0.32
PM2.5	8	0.593	0.122	0.786	0.0208

^{*2014} Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05

Case Study: Refineries

Refineries represent another industrial sector covered by the Cap-and-Trade Program for which both GHG emissions and air toxics emissions data are available. Facilities from this sector were also identified as having among the highest toxicity-weighted emissions (see Table 9 above). Table 14 below lists 19 refineries reporting covered emissions in 2014. Most of these facilities are within one-half mile of an SB 535 disadvantaged census tract. Facilities have been grouped here by additional activities performed by the facilities that are relevant to GHG emissions, namely hydrogen production (generally for use by the refinery) and CO₂ production for off-site distribution.

Table 14. California Refineries Evaluated for GHG and Air Toxics Emissions. Shaded Rows Indicate Facilities within One-Half Mile of an SB 535 Disadvantaged Census Tract.

	Approx.	
Facility Name	Location	Sectors*
Alon Bakersfield Refinery, Areas 1 & 2	Bakersfield	Refinery
Edgington Oil Company	Long Beach	Refinery
Kern Oil Refinery	Bakersfield	Refinery
Lunday-Thagard Company, DBA World Oil Refining	South Gate	Refinery
Paramount Petroleum Corporation Refinery	Paramount	Refinery
Phillips 66 Company, Santa Maria Refinery	Arroyo Grande	Refinery
Ultramar Inc, Valero Wilmington	Wilmington	Refinery
Phillips 66 Company, San Francisco Refinery	Rodeo	Refinery, H ₂
San Joaquin Refining Company	Bakersfield	Refinery, H ₂
Shell Oil Products US	Martinez	Refinery, H ₂
Chevron Products Company	El Segundo	Refinery, H ₂ , CO ₂
Chevron Products Company	Richmond	Refinery, H ₂ , CO ₂
ExxonMobil Oil Corporation	Torrance	Refinery, H ₂ , CO ₂
Phillips 66 Company, Los Angeles Refinery	Carson	Refinery, H ₂ , CO ₂
Phillips 66 Company, Los Angeles Refinery	Wilmington	Refinery, H ₂ , CO ₂
Tesoro Refining & Marketing Company LLC, Los	Carson	Refinery, H ₂ , CO ₂
Angeles Refinery		
Tesoro Refining and Marketing Company	Martinez	Refinery, H ₂ , CO ₂
Valero Refining Company, Refinery and Asphalt Plant	Benicia	Refinery, H ₂ , CO ₂

^{*} Refinery activities include production of hydrogen (H₂) on-site and production of CO₂ for distribution.

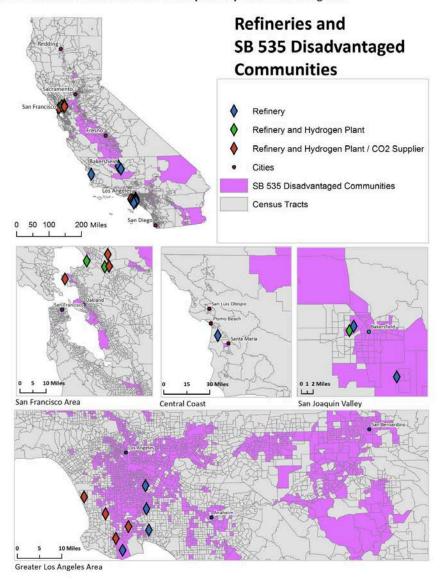


Figure 8. Location of Refineries Covered by the Cap-and-Trade Program.

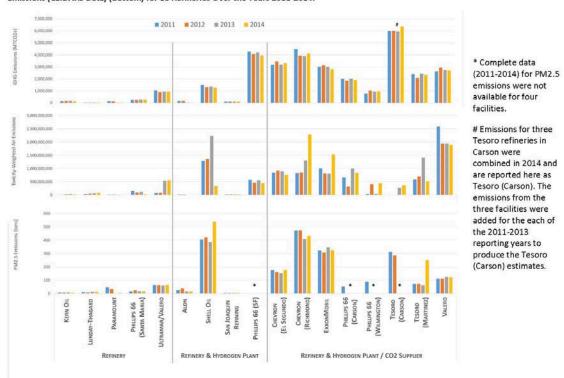


Figure 9. Refineries: Emitter Covered Emissions of GHGs (MRR Data) (Top), Toxicity-Weighted Air Emissions (TRI Data) (Middle), and PM2.5 Emissions (CEIDARS Data) (Bottom) for 18 Refineries Over the Years 2011-2014.

Charts showing the trends in GHG, air toxics, and PM2.5 emissions over the years 2011-2014 are shown in Figure 8. Edgington Oil Company was omitted from the chart because emissions levels were negligible over this reporting period.

Correlations between covered GHG emissions and toxicity-weighted air emissions from refineries were positive and statistically significant using this US EPA data set for air toxics emissions (Pearson r-value = 0.56; p = 0.015; Spearman r-value 0.81, p<0.0001); the correlations increased with logarithmic transformation (Pearson r-value = 0.87, p<0.00001). Visual inspection of the overall patterns also suggests facilities with higher emissions of GHGs tend to have higher emissions of both toxicity-weighted emissions and PM2.5.

In certain cases, the emission levels across these types of facilities did not correlate well. For example, the Shell Oil refinery and hydrogen plant (Martinez) produced moderate GHG emissions, but it was one of the highest sources of PM2.5 emissions across all facilities. Similarly, the Valero refinery, hydrogen plant, and CO₂ distributor (Benicia) also produced modest levels of GHGs, but it had among the highest rates of toxicity-weighted air emissions. Differences in relative emissions may correspond, for example, to the types of products that are made at different facilities.

Table 15. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. PM2.5 Emissions (CEIDARS Data) or Toxicity-Weighted Air Emissions (TRI Data) for Refineries*.

GHG Emissions vs	No.	Pearson (r-value)	Stat. Sig. (p-value)	Spearman (r-value)	Stat. Sig. (p-value)
Toxicity-weighted air emissions	18	0.563	0.0150	0.806	<0.0001
PM2.5	14	0.914	< 0.00001	0.916	< 0.00001

^{*2014} Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05

VIII Discussion & Conclusions

This initial analysis is intended to inform future investigation of potential benefits and impacts to disadvantaged communities from emissions of toxic air pollutants, especially to the extent they are influenced by the greenhouse gas limits put in place through activities pursuant to AB 32. However, there are not enough emissions data available at this time to allow for a comprehensive and conclusive analysis. This report makes some preliminary findings that OEHHA expects to build upon in future analyses as it acquires and evaluates more data, but does not provide definitive findings regarding the effects of the GHG limit on any individual community, or disadvantaged communities in general.

Still, at this point in time, the analysis shows that many SB 535 disadvantaged communities are likely to see benefits or impacts from changes in emissions from the facilities covered under the Cap-and-Trade Program. This is because a disproportionate number of these facilities are located in or very close to these communities, and 2014 data show that overall GHG emissions appear to be positively correlated with criteria air pollutants and toxic air contaminants, although within specific industrial sectors not all correlations are statistically significant. In addition, some of the most highly polluting of these facilities are more likely to be located in these communities.

The relationship between greenhouse gas and toxic air pollutant emissions is complex. Fuel combustion is a primary source of GHG emissions across many of the industrial sectors that are currently covered by the Cap-and-Trade Program. Fuel combustion is also likely to produce a number of toxic air pollutants. For this reason, responses by facilities to the Cap-and-Trade Program that result in reductions in fuel use or increases in fuel efficiency are likely to have benefits from reductions of toxic pollutants at similar levels of production. Toxic air pollutants from activities other than fuel combustion are likely to vary widely by industrial processes. Additional investigation is warranted to understand how industrial facilities will comply with the Cap-and-Trade Program's requirements over time and how this may affect the release of air toxics.

For calendar year 2014 data, there are positive correlations between GHG, PM2.5 and toxic air pollutant emissions. The correlation between GHG and toxic emissions is especially notable in this initial analysis for refineries, hydrogen plants, and cement plants, although the total number of facilities in each of these sectors is relatively small. Further analysis by industrial sector and by specific chemical pollutants may reveal additional important relationships.

Future Data Collection and Analysis

The key challenge in analyzing the benefits and impacts of climate-change programs on disadvantaged communities is acquiring adequate data. As discussed in this report, data on emissions of GHGs, criteria air pollutants and toxic air pollutants are collected by multiple entities under different programs and statutory mandates. To date, there is no co-reporting of GHG and toxic emissions, and differences in reporting requirements across regulatory programs can complicate data analysis. In addition, toxic emissions data for many facilities are only updated every four years, further limiting conclusions that can be reached. Co-reporting of criteria, air-toxic and GHG emissions for the facilities subject to the Cap-and-Trade Program would aid investigation of emissions impacts. OEHHA will continue to acquire and analyze data for future reports, which will build upon the initial findings presented in this report.

Also, the Cap-and-Trade Program is still new, making it difficult to discern trends in how the program over time may be affecting emissions of criteria air pollutants and toxic air

contaminants. As the program continues to generate data over the next several years, it will be easier to detect and evaluate any such trends. It will also be important to evaluate the Cap-and-Trade Program in concert with other climate policies to evaluate the entire climate change program in aggregate.

In the near-term, OEHHA intends to obtain pre-2014 toxic air pollutant data to investigate how such data can be used to analyze impacts in SB 535 disadvantaged communities. OEHHA will also explore how Cap-and-Trade Program data may be helpful to understanding the drivers of changes in toxic pollutant emissions.

OEHHA also intends to further examine relationships between the emissions of GHGs and toxic air pollutants in specific industrial sectors in order to gain a better understanding of likely benefits or impacts that may result from changes in GHG emissions, even if air toxics emissions data are not available.

Lastly, OEHHA will explore opportunities to examine potential benefits and impacts in disadvantaged communities for other AB 32 programs outside of the Cap-and-Trade Program. OEHHA will work with ARB in developing analyses to support implementation of the Cap-and-Trade Adaptive Management Program to identify and track any emissions increases that could be attributable to the Cap-and-Trade Program.

Appendix A

California's Cap-and-Trade Program, Air Toxics "Hot Spots" Program, and US EPA's Toxic Release Inventory Program each has slightly different definitions of "facility". Some of these differences may have implications for how emissions data are reported such that there may not be an exact one-to-one relationship.

The following definitions of "facilities" are from different programs:

Cap-and-Trade Program

- (144) (A) "Facility," unless otherwise specified in relation to natural gas distribution facilities and onshore petroleum and natural gas production facilities as defined in section 95802(a), means any physical property, plant, building, structure, source, or stationary equipment located on one or more contiguous or adjacent properties in actual physical contact or separated solely by a public roadway or other public right-of-way and under common ownership or common control, that emits or may emit any greenhouse gas. Operators of military installations may classify such installations as more than a single facility based on distinct and independent functional groupings within contiguous military properties.
- (B) "Facility," with respect to natural gas distribution for the purposes of sections 95150 through 95158 of MRR, means the collection of all distribution pipelines and metering-regulating stations that are operated by a Local Distribution Company (LDC) within the State of California that is regulated as a separate operating company by a public utility commission or that are operated as an independent municipally-owned distribution system.
- (C) "Facility," with respect to onshore petroleum and natural gas production for the purposes of sections 95150 through 95158 of MRR, means all petroleum and natural gas equipment on a well-pad, or associated with a well pad or to which emulsion is transferred and CO₂ EOR operations that are under common ownership or common control including leased, rented, or contracted activities by an onshore petroleum and natural gas production owner or operator and that are located in a single hydrocarbon basin as defined in section 95102(a) of MRR.

When a commonly owned cogeneration plant is within the basin, the cogeneration plant is only considered part of the onshore petroleum and natural gas production facility if the onshore petroleum and natural gas production facility operator or owner has a greater than fifty percent ownership share in the cogeneration plant. Where a person or entity owns or operates more than one well in a basin, then all onshore petroleum and natural gas production equipment associated with all wells that the person or entity owns or operates in the basin would be considered one facility.

Air Toxics 'Hot Spots' Program

Health and Safety Code, Section 44304 defines facility as "every structure, appurtenance, installation, and improvement on land which is associated with a source of air releases or potential air releases of a hazardous material." The Guidelines further state that: "[e]xcept for the oil production operations defined in section X.14(b), for purposes of this regulation, the phrase "every structure, appurtenance, installation" shall mean all equipment, buildings, and other stationary items, or aggregations thereof, (A) which are associated with a source of air emission or potential air emission of a listed substance; (B) which involve activities that belong to the same two-digit Standard Industrial Classification code, or are part of a common operation; (C) which are located on a single site or on contiguous or adjacent sites; and (D) which are under common ownership,

operation, or control, or which are owned or operated by entities which are under common ownership, operation, or control."

US EPA Toxic Release Inventory Program

Facility definition: "An entire facility means all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with such person). A facility may contain more than one establishment."

Table A1. Pearson (P) & Spearman (S) Correlation Coefficient R-Values for Criteria Air Pollutants and GHGs by Industrial Sector. Shaded Boxes Indicate Statistically Significant Correlations.

	Cement Plants		Cogeneration		Hydrogen Plants		Electricity Generation		Oil & Gas Production		Refineries		Other Combustion	
	P	S	P	S	P	S	P	S	P	S	P	S	P	S
co	0.094	0.050	-0.031	0.197	-0.072	0.464	0.262	0.465	0.519	0.073	0.802	0.918	0.318	0.186
NOx	0.877	0.883	0.128	0.363	0.612	0.786	0.472	0.728	-0.026	0.122	0.913	0.921	0.884	0.306
SOx	0.193	0.467	0.211	0.484	0.574	0.771	0.487	0.651	0.265	0.361	0.675	0.797	0.202	0.544
PM	0.785	0.867	0.025	0.220	0.538	0.500	0.699	0.648	0.259	0.184	0.883	0.906	0.414	0.442
PM10	0.748	0.833	0.095	0.294	0.574	0.679	0.711	0.655	0.260	0.190	0.898	0.944	0.509	0.499
PM2.5	0.645	0.817	0.137	0.377	0.608	0.786	0.713	0.663	0.261	0.189	0.908	0.944	0.616	0.598
ROG	0.604	0.467	0.267	0.108	0.547	0.643	0.441	0.439	0.155	0.207	0.833	0.965	-0.003	0.043
TOG	0.525	0.467	0.331	0.148	0.799	0.821	0.556	0.660	0.255	0.271	0.892	0.959	0.075	0.141
VOCs	0.698	0.667	0.267	0.152	0.765	0.714	0.505	0.480	0.155	0.207	0.845	0.956	0.006	0.044

Exhibit 5

The California Environmental Justice Advisory Committee's Declaration in Support of Carbon Pricing Reform in California

Approved by Environmental Justice Advisory Committee by majority vote (6-0, 3 abstained) February 15, 2017

- 1. Whereas, the climate system of the planet and the energy choices we make are inextricably linked to a looming ecological and social catastrophe; and
- 2. Whereas, the United States and all other countries of the world face a moment of great promise and great peril regarding our energy production and use, including: 1) our overdependence on fossil fuels such as oil, natural gas, and coal; 2) the production and use of bio-fuels with dubious sustainability attributes; and 3) the resurgence of domestic and international nuclear power development; and
- Whereas, Asian, Black, Latino, and Native American communities in the United States, as well as
 indigenous and poor people around the world, disproportionately bear the negative economic,
 environmental, and health impacts of the fossil fuel economy at every stage of its life cycle including its
 exploration, extraction, production, refining, distribution, consumption, and disposal of its waste; and
- 4. Whereas, global climate change caused by the entire life cycle of fossil fuels, resulting in the release of carbon dioxide, other greenhouse gases, and associated co-pollutants into our oceans, air, soil, and vegetation jeopardizes the planet's ability to maintain a livable climate and causes grave health problems in poor communities, communities of color, and indigenous communities around the world; and
- Whereas, the international scientific community predicts that climate change will cause great human suffering, the brunt of which will be borne by the world's poor, developing nations, disenfranchised indigenous communities, the infirm, and peoples of color that have been historically discriminated against at global, national, and local levels; and
- Whereas, the best available science indicates that the planet is warming more rapidly than we understood
 when the Kyoto Accord was ratified and that reductions in greenhouse gases must be undertaken more
 quickly and with greater urgency than previously recognized; and
- 7. Whereas, economic globalization steers international commodity markets to manufacture and privatize the "right" to dispose of greenhouse gases and their co-pollutants into the air, oceans, soil, vegetation and human bodies and is in direct conflict with the true human rights of people and respect for our planet; and
- 8. Whereas, his Holiness Pope Francis believes that the "strategy of buying and selling 'carbon credits' can lead to a new form of speculation which would not help reduce the emission of polluting gases worldwide . . [and] in no way does it allow for the radical change which present circumstances require"; and
- Whereas, carbon trading is undemocratic because it allows entrenched polluters, market designers, and commodity traders to determine whether and where to reduce greenhouse gases and co-pollutant emissions without allowing impacted communities or governments to participate in those decisions; and
- 10. Whereas, the political power of the major global polluters has resulted in a carbon trading scheme in California that prevents the public from access to essential facility-specific compliance data, allows gaming of the system by market participants through such practices as resource shuffling, allows for excessive use of out-of-state offsets, and lacks meaningful penalties for failure to comply; and
- 11. Whereas, a recent study of California cap and trade found that many industry sectors increased in-state emissions, environmental justice communities are disproportionately impacted by climate polluters, excessive use of offsets denies environmental justice communities the benefits of on-site reductions, and validates the concerns raised by the environmental justice community after the passage of Assembly Bill 32; and
- 12. Whereas, revenue from the auction of allowances has provided important funding for greenhouse gas emissions reduction projects, and the Environmental Justice Advisory Committee has secured a portion of that revenue to benefit low-income and disadvantaged communities throughout California; and
- 13. Whereas, the California Legislature passed Senate Bill 32 in 2016, which enacted the most stringent climate reduction mandate in the world, requiring a forty percent reduction from 1990 levels by 2030; and
- 14. Whereas, the California Legislature passed Assembly Bill 197 in 2016, which enacted substantial reform to benefit environmental justice communities, including a mandate to the Air Resources Board to prioritize direct emissions reductions in the strategy to achieve the 2030 target; and

- 15. Whereas, the California Air Resources Board has drafted a 2030 Target Scoping Plan that does not reflect best practices in research or serve the interests of poor communities, communities of color, and indigenous communities in California and around the world; and
- 16. Whereas, greenhouse gases from fossil fuels will be substantially reduced only through a transition to greater energy efficiency and sustainable energy technologies that do not rely on fossil fuels; and
- 17. Whereas, capturing energy from the wind, sun, ocean, and heat stored within the Earth's crust builds the health and self-reliance of people and our communities, protects the planet, creates jobs, and expands the global economy; and
- 18. Whereas, greenhouse gases from agricultural sources must be reduced substantially in order to achieve the 2030 target, especially methane emitted by liquefied manure at factory farms; and
- 19. Whereas, sustainable agricultural practices such as pasture-based carbon sequestration presents the opportunity to utilize regenerative farming practices which benefit the climate and rural environmental justice communities; and
- 20. Whereas, global energy transformation is the politically unifying and inclusive principle that affirms the rights of all people -- including the poor, women, rural and indigenous communities -- to have access to affordable and sustainable energy and the enhanced quality of life that such access affords; and
- 21. Whereas, placing an appropriate price on carbon provides further incentives to decrease greenhouse gas emissions while generating revenue.

The California Environmental Justice Advisory Committee DECLARES that the California Cap and Trade system is inequitable and does not reflect the principles of environmental justice; and

The California Environmental Justice Advisory Committee FURTHER DECLARES that we will oppose at every turn all efforts to extend the California Cap and Trade system in California beyond 2020; and

The California Environmental Justice Advisory Committee FURTHER DECLARES that our demands for real changes in the way we make and use energy will not be silenced by promises of money or token adjustments to the fundamentally flawed trading and offsets approach.

The California Environmental Justice Advisory Committee FURTHER DECLARES that it supports a carbon tax, used in combination with direct emissions reductions, as a policy to replace the revenue generating component of Cap and Trade and to benefit environmental justice communities, support clean energy development, fund a just workforce transition to clean energy, invest in communities' capacity and infrastructure to adapt to climate change, and return a substantial portion to the public so that Californians, especially low-income residents, receive financial support during the transition to a clean energy economy.

BE IT THEREFORE, RESOLVED, that the California Environmental Justice Advisory Committee stands with communities around the world in opposition to carbon trading and offset use and the continued over reliance on fossil fuels; and

BE IT FURTHER RESOLVED, that the California Environmental Justice Advisory Committee will support conservation, regulatory, and other measures to address greenhouse gases only if they directly and significantly reduce emissions, require the shift away from use of fossil fuels and nuclear power, and do not cause or exacerbate the pollution burden of poor communities of color in California, as well as in the United States and developing nations around the world; and

BE IT FURTHER RESOLVED, that the California Environmental Justice Advisory Committee will oppose efforts by our state government to extend Cap and Trade, because this program will not reduce greenhouse gas emissions at the pace called for by the international scientific community, it will not result in a shift to clean and sustainable energy sources, it will support and enrich the state's worst polluters, it will fail to address the existing and future inequitable burden of pollution, it will deprive communities of the ability to protect and enhance their communities, and because if our state joins regional or international trading schemes it will further create incentives for carbon offset programs that harm communities in California, the region, the country, and developing nations around the world.

THEREFORE We, the undersigned organizations and individuals, affirm our solidarity with the California Environmental Justice Advisory Committee, poor, and indigenous people around the world.



Targeted policies can reduce reliance on aging peaker plants

A Comment to the California Air Resources Board

Re: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target and Draft Environmental Analysis

Submitted via: https://www.arb.ca.gov/lispub/comm/bclist.php

Andrew Wilson, David Weiskopf (JD, MS)

NextGen Climate America

10 April 2017

SUMMARY

NextGen Climate America is grateful for the opportunity to comment on the scoping plan for California's 2030 Greenhouse Gas Target and its associated draft environmental analysis ("scoping plan").

167-1

Letter

167

We commend ARB for developing a detailed proposal that takes a comprehensive approach to meeting California's vital 2030 global warming pollution reduction target and for the open and inclusive process that ARB is following to refine the plan. We appreciate ARB's commitment to an integrated strategy that combines direct regulation of key sources with an efficient market-based mechanism to ensure that the overall target is achieved, while prioritizing redressing the burden of environmental pollution on disadvantaged communities.

This comment addresses the need for the scoping plan to fully consider the diversity of emissions sources across California. Based on our analysis, we recommend that ARB consider additional direct regulations and mechanisms in its scoping plan to reduce reliance on aging peaker plants, and more thoroughly analyze how approaches to meeting California's carbon pollution reduction targets during the 2020–2030 compliance period can prioritize displacing pollution from peakers as a means of maximizing health and equity co-benefits.

Four principal findings inform our recommendation:

- peaker plants have relatively high carbon and copollutant intensity per unit of power generated
- 2. peaker plants are disproportionately located in disadvantaged communities ("DACs")
- 3. peaker plants are used disproportionately on poor air quality days
- non-fossil alternatives to peakers will be increasingly available during the 2020-2030 compliance period.

ARB's proposed cap-and-trade policy does not adequately address the issue of peaker copollutant emissions. Further, given other elements of the scoping plan—such as a stricter Renewable Portfolio Standard ("RPS"), Mobile Source Strategy, and Freight Action Plan—demand for peaker generation is not expected to decline proportional to the declining GHG cap; it may even increase. Because of the equity and public health concerns prolonged reliance on fossil peakers presents, ARB should consider additional direct regulations to reduce peaker demand and how these measures can increase the overall effectiveness and health benefits of a cap and trade system, particularly for residents living in DACs.

1. The Role of Peakers' in the Electric Power System

The power system must dynamically adapt to serve fluctuations in energy supply and demand. Most fluctuations in demand originate in people's life patterns; most fluctuations in supply originate in the operational constraints of dedicated electricity generation resources, including renewables and traditional fossil fuel generation.

As existing plants undergo natural obsolescence and depreciation, marginal choices are made to permit and construct new generation facilities. Apart from relevant regulatory frameworks, the key economic measure driving these choices is the projected long-run average cost of the facility. Long-run average cost is calculated as the sum of the initial fixed cost of the facility and its marginal operation and maintenance costs divided by the number of hours the facility is expected to run during its useful life. More efficient and durable facilities (those with a lower marginal cost of generation) are in general more advanced and hence have a higher initial fixed cost of construction; less efficient facilities have in general lower fixed costs but higher variable costs. Some costs of the facilities have in general lower fixed costs but higher variable costs.

Importantly, total energy demand in California is unusually high on summer and winter afternoons when people return home from work and switch on heating and cooling appliances. Energy supply, as California expands its portfolio of renewables, is usually highest during the day, when insolation and wind speeds are higher. Critical mismatches between energy demand and energy supply occur only a handful of hours each year, though other needs of the power system are present daily, including ramping, voltage support, and frequency regulation.

When energy suppliers plan to meet peak demand, they aim to provide generation and ancillary needs at minimum long-run average cost: facilities like peakers that operate a relatively small number of hours each year⁴ achieve low long-run average cost when their fixed cost is low relative to their marginal cost of generation.⁵ Accordingly, peakers are generally simpler, higher-polluting, and less efficient than other types of generation facilities.

Though peakers have historically been arguably the economically efficient solution to a fundamental challenge of the power system—how to meet recurrent but short periods of very high demand and provide critical ancillary services—they have also had a disproportionate environmental impact. Fortunately, emerging storage and grid interactivity electronic technologies are beginning to offer lower-cost and low-polluting alternatives to legacy fossil peakers.

2. Peakers Have Disproportionately Large Environmental and Public Health Impacts

While emissions of greenhouse gases have a global impact, fossil fuel power plants also emit copollutants that have local environmental and public health impacts, including nitrogen

167-2

1

¹ This analysis uses primarily data on California natural gas power plants' qualities and emissions from 2014. Very few changes have been made to California's fleet of natural gas-fired plants since this time. A table of summary statistics for the observed power plants is included at the end of this comment.

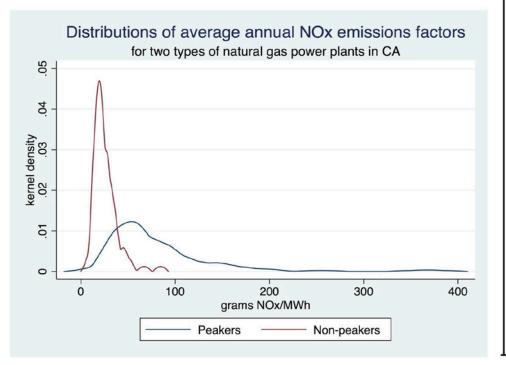
 $^{^2 \ \}text{http://www.eei.org/issuesandpolicy/stateregulation/Documents/ResourcePlanningProcurement.pdf}$

³ Drbal, Lawrence F., Patricia G. Boston, and Kayla L. Westra. Power Plant Engineering. 2005. p. 820

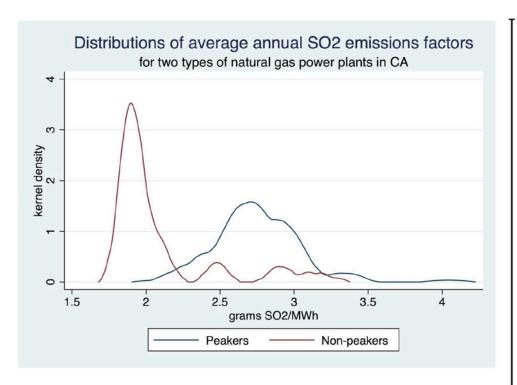
^{4 10.9%} of hours on average in 2014 (EIA)

When assessing a potential peaker installation, a capacity factor of 10–30 percent if typically assumed. See: http://instituteforenergyresearch.org/wp-content/uploads/2015/06/ier_lcoe_2015.pdf

oxides (NOx), sulfur dioxide (SO_2), and particulate matter. NOx also serves as a precursor for the formation of ozone and very fine particulate matter ($PM_{2.5}$). Peakers in particular emit high levels of NOx and SO_2 per unit of power generated, as shown Figures 1 and 2.



167-2 cont.



167-2 cont

The environmental and public health impact of peakers is disproportionately borne by disadvantaged communities. As Krieger et al. write in a recent article published in *Energy Policy*:

Short-term and chronic ozone exposure has been found to increase mortality rates, particularly respiratory and pulmonary deaths. High PM2.5 concentrations increase the rate of acute coronary events, particularly in those with underlying disease and the elderly. Some populations are more at risk to exposure than other groups: high 1-h NOx concentrations, 8-h ozone concentrations, and 24-h PM2.5 concentrations are associated with increased asthma-related hospital visits in children; 8-h ozone concentrations are also strongly correlated with negative health impacts on the elderly and those with low employment status, and weakly correlated with impacts on ethnic or racial minority populations, and populations with high poverty rates or low educational status.

While our analysis finds that peakers are located in communities that look in many ways demographically similar to the rest of the state, these communities are also significantly higher

3

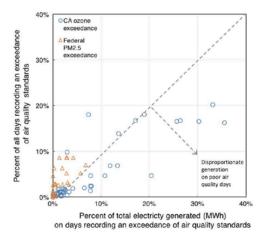
concentrations of Latino and Asian American residents and significantly lower concentrations of white residents. We also find that peakers are sited in communities that suffer unusually high environmental burdens. Specifically, California communities within 5 miles of peakers exhibit ambient PM_{25} concentrations roughly 56% higher than the state average, diesel PM six times the state average, toxic releases 11-times more frequent than the state average, and traffic levels four times the state average. In all, these communities have state environmental risk scores 22% higher than the average California community. In a separate but related analysis, we find that one's overall proximity to California's peakers is significantly predictive (p < 0.01) of a community's environmental quality.

167-2 cont

While we do not imply that peakers are solely responsible for the poor environmental quality of the communities in which they are sited, we note that, as a matter of equity, reductions in peaker pollution would, on average, provide important environmental benefits to communities that currently bear some of the heaviest environmental burdens and to many Californians of color.

Compounding these harms, peaker demand is disproportionately high on days with disproportionately poor air quality; at these times, the acute effects of peaker emissions are magnified. See Figure 3, reproduced from Krieger, et al. (cited above), demonstrating peakers' high levels of activity on ozone exceedance days:

4



167-2 cont

In addition to equity considerations, the potential health benefits of reducing our reliance on fossil peaker plants are substantial: in the 2015 Clean Power Plan, the U.S. EPA estimated the 2020 health benefit of reducing NOx emissions to be highest in California, at \$22,000–49,000/ton PM_{2.5} and \$14,000–59,000/ton ozone.

3. The Scoping Plan's Proposed Cap-And-Trade Implementation Insufficiently Incentivizes Reductions In Demand For Peakers—And May Even Increase Demand For Them

Senate Bill 350 (SB 350)⁷ requires the State to set GHG reduction planning targets both for the electricity sector as a whole and for individual utilities and other electricity providers (collectively known as load serving entities), which will develop strategies to reduce GHG emissions through Integrated Resource Planning. The bill also codifies an increase in the Renewables Portfolio Standard (RPS) to 50 percent by 2030. Most of this increased renewable generation (up from 33 percent by 2020) is expected to be solar and wind. While these resources are generally predictable in their output and allow for a certain degree of dispatchability, variations in power output will occur as a result of fluctuations in insolation and wind speed. These variations must be addressed in order to balance electric supply and demand, and to maximize the efficiency of the electric power system as a whole.

Grid operators currently use three main strategies to balance fluctuating generation throughout a day: curtailment, load shifting, and ramping dispatchable generation sources, including peakers.

The first, curtailment, involves operating renewables below their maximum power output. Though effective, this strategy involves forgoing zero or very low marginal cost and marginal

5

⁶ EPA, 2015. Regulatory impact analysis for the Clean Power Plan final rule. Tech. Rep. EPA 452-R-15–003, U.S. Environmental Protection Agency (August).

http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

De Leon, Chapter 547, Statutes of 2015.

emission generation, increasing costs to consumers and the overall carbon intensity of California's energy system. Further, customer-installed generation—spurred by load-modifying policies such as net energy metering, the California Solar Initiative, the Self-Generation Incentive Program, and the federal Production Tax Credit and Investment Tax Credit—is generally not-dispatchable (cannot be curtailed by CAISO).

The second strategy, load shifting, encompasses a number of tactics, including demand response programs and deploying battery storage arrays. The third strategy includes adjusting output at dispatchable renewable energy sources, such as hydroelectric facilities, but often the default approach of utilities and grid operators is to authorize the construction and use of natural gas plants—often peakers. Indeed, while meeting peak demand is still an important use case for peakers, the increasing flexibility, but relative geographic concentration of large-scale renewable resources has meant that other services provided by peakers—including ramping during non-peak times and ancillary power quality° services—have become relatively more important. As renewable generation patterns become increasingly predictable, and to some extent controllable, resources with moderate ramping times will be able to meet more of the need for additional generation when peak demand coincides with reduced output at wind and solar plants, but for outage events and unpredictable weather conditions, fast ramping resources will always be needed. Ancillary services are often needed in geographically-specific load pockets and transmission areas that may be far from large renewable and non-renewable generation sources. Small peakers often provide these services today. If they are replaced by generation or storage resources, these replacement resources must be similarly-sited.

In sum, the increase of renewables in the California power system is expected to increase demand for fast-ramping capability and localized ancillary services for grid stability. It would be a mistake, however, to conflate this need with a need for continued reliance on aging, expensive, and high-polluting peakers.

In addition to market and rate-design tools to incentivize demand response and better alignment of demand and peak supply, both distributed and utility-scale energy storage options offer a cleaner and safer alternative to continued reliance on peakers. Accordingly, ARB should prioritize approaches to Cap and Trade that will incentivize a transition away from these legacy polluters and towards cleaner alternatives.

California's **Mobile Source Strategy** aims to realize 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025 (with up to 4.2 million ZEVs by 2030), with an additional 100 percent of new urban buses and 10 percent of new delivery vehicles also zero-emission by 2030. Depending on the technology installed, these vehicles can reduce and beneficially shape total

Typically defined as load-following, regulation (up and down), contingency reserves (spin and non-spin), frequency response, reactive power (voltage support), and "black start." CAISO currently operates ancillary services markets for only regulation (up and down) and contingency reserves. CAISO is currently considering introducing markets for voltage support, frequency regulation, and a flexible ramping product. See www.caiso.com/informed/Pages/StakeholderProcesses/ReactivePowerRequirements-FinancialCompensation.aspx and

www.caiso.com/informed/Pages/StakeholderProcesses/FrequencyResponse.aspx.

⁹ Appendix P of the scoping plan notes: "... the variable nature of certain renewables, such as wind and solar, may lessen [the air quality improvements under the cap-and-trade program] and could contribute to localized impacts due to their variable nature and the need to back up the technologies with fossil generation to meet peak demand."

load by aligning charging times with times when renewable resources may otherwise be curtailed with time of use rates or remote dispatchable charging (and discharging).

California's **Sustainable Freight Action Plan** aims to see the deployment of over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030. Integrating this new source of flexible load can also help to reduce our reliance on peakers.

But, despite potential gains from the above policies, the mechanisms by which we will achieve grid benefits of distributed and vehicle-based storage are only beginning to emerge. If millions of EVs are added to our electric power system without smart approaches to how they can help shape load, our peak power ancillary services, and ramping needs may increase, rather than decrease, which could drive additional market pressures towards increased reliance on peakers. ARB should therefore consider both how these resources can best be integrated to maximize the benefits of our Cap and Trade system, and also how direct regulation and market conditions can reduce peaker pollution.

4. Better Alternatives to Legacy and New Fossil Peakers Exist

We identify six main technologies that can be deployed to reduce peaker demand: distributed solar with advanced inverters (DSAI), energy storage (ES; many types), synchronous condensers and clutch couplings, demand response (DR; interruptible load, direct load control, and behavioral load shaping), energy efficiency (EE), and advanced electric vehicles (AEVs).

A number of policies are in place to encourage the adoption of distributed solar power. However, most of the installed distributed solar generates energy naively: grid operators have no control over its contributions to overall levels of energy in the grid and the grid's power quality. **Advanced inverters** solve some of these challenges by enabling "more elaborate monitoring and communication of the grid status to the solar unit (and vice versa), the ability to receive operation instructions from a centralized location, and the capability to make autonomous decisions to improve grid stability, support power quality, and provide ancillary services." DSAI does not, however, enhance the power system's ability to meet peak demand beyond what distributed solar may provide in the absence of DSAI. ARB should evaluate how DSAI can help to reduce reliance on peakers and reduce peaker pollution to the extent that DSAI replaces peaker operation for certain ancillary services.

AB 2514 (and subsequent rulemaking by the CPUC, such as D. 13-10-040) established a 1.3 GW energy storage target for 2020. The storage target covers a number of diverse technologies, including compressed air storage, battery storage, and small pumped hydro operations (less than 50 MW in total capacity). Between 2020 and 2030, California can and should readily exceed this target many times over. In addition to the development of larger storage resources pursuant to AB 2514, additional EVs, distributed combined solar and storage systems, and improved grid interactivity for EVs as well as home and commercial electric appliances and water heaters are likely to continue to grow significantly in the next 13 years. ARB should accordingly evaluate how these resources can reduce our reliance on peakers for ramping,

National Renewable Energy Laboratory. 2014. Advanced Inverter Functions to Support High Levels of Distributed Solar Power. U.S. Department of Energy.

ancillary services, and meeting peak demand, in addition to reducing curtailment of high levels of renewable energy as we move towards meeting our 50% RPS.

Most peakers can be retrofitted with **synchronous condensers and clutch couplings**, technologies that allow them to be operated without generating solely for the purpose of providing ancillary services. These technologies draw power from the grid in order to power large machinery that feeds voltage into the grid and helps to regulate electric frequency on the grid in much the same manner conventional power plants do. Though a recent economic analysis seems to suggest that these technologies are not profitable additions to peakers as currently operated, they might prove cheaper and simpler to operate than other sources of ancillary services where significant sunk costs and geographic constraints create conditions that incentivize continued utilization of existing peaker pad sites for ancillary services, even where peakers are no longer regularly utilized for generation.

Demand response is a broad name for a collection of technologies that achieve load shifting/shaping by centralizing control over energy demand. Some demand response strategies significantly empower power system management authorities: interruptible load grants these authorities the ability to interrupt large sources of industrial or commercial demand; direct load control does the same for consumers. Other systems simply build pathways through which these authorities can send a signal to customers to voluntarily and temporarily reduce their energy use at times when the grid is most burdened. Finally, behavioral load shaping, although currently uncommon in the United States, dynamically delays energy demand of large appliances by small amounts of time to balance total system load in an automated manner. ARB should consider how demand response programs can function within the scoping plan to help reduce reliance on peakers.

Energy efficiency technologies reduce the total magnitude of demand at most times by reducing the amount of power needed to perform some function at the point the power is consumed. To the extent that efficiency measures target behaviors and technologies that contribute most to peak load, these technologies can have disproportionately large benefits for peak-shaving and reduced ramping needs. ARB should analyze how utilities increased and increasingly optimized efficiency programs can help to reduce our reliance on fossil peakers between 2020 and 2030.

Finally, advanced electric vehicles reduce peaker demand by intelligent scheduling charging or returning power to the grid when necessary (acting, essentially, as distributed energy storage resources). Advanced electric vehicle technology ranges from simple—charging is stopped during very critical periods each year—to complex—fully interactive vehicle batteries that are both charging and returning energy to the grid whenever ideal. More advanced technology, as one might expect, costs more; the rate of battery degradation also increases when batteries are bidirectional. In order to achieve the maximum benefit of two-way grid-interactive EVs (V2G), California should therefore help EV owners to obtain some of the significant financial benefit that two-way charging provides to the electrical system by reducing the need for what is often extraordinarily expensive peak power supplies. Because the development of V2G remains in

8

 $[\]label{lem:http://docketpublic.energy.ca.gov/PublicDocuments/15-AFC-01/TN210450_20160218T120232_Synchronous_Condenser_Analysis.pdf$

part contingent on policies that are difficult for ARB to anticipate, ARB should consider EV scenarios that include the potential for grid non-interactive EVs, EVs that function as dispatchable load, and V2G when evaluating how increased EV penetration can help to reduce reliance on legacy fossil peakers.

Non-Fossil Technologies Can Provide Technically and Economically Feasible Solutions for Peakers' Six Primary Functions

Peakers perform six primary functions for the power system: generating capacity, voltage regulation, frequency regulation, load following, operating reserves, and a 'black start' option. All functions can be provided by a combination of the non-fossil technologies described above.

Peakers provide high-need, flexible **generating capacity** during periods of especially high load. Energy storage technologies can directly provide a form of generating capacity, if charged, and demand response and energy efficiency technologies indirectly provide the equivalent of peak period capacity by reducing demand during these periods.

Power quality, both in the sense of **voltage support** and **frequency regulation**, can be feasibly provided by energy storage technologies and distributed solar with advanced inverters. Energy storage is particularly well-suited to the task, with a number of profitable storage projects already developed specifically to serve these needs.¹²

Demand response and energy storage are capable of load following.

Energy storage and demand response can be used to increase supply or reduce demand on the grid in place of central generators that would otherwise be used in case of contingencies. The same technologies can also provide both fast-response **operating reserves** (e.g., spinning reserves) and slower-response reserves (e.g., supplemental reserves).

Finally, energy storage alone is capable of powering a 'black start.' Many plants today have diesel backups to help with black start, which are tested on a weekly or monthly basis, have lower stacks and much higher emission rates. Batteries could replace these diesel gensets. The co-location of storage and a gas plant could help reduce emissions from ramping, as well.¹³

6. Policy Approaches to Spur Deployment of Non-fossil Replacements for Peakers

We identify five policy mechanisms that would decrease demand for peakers during high impact periods by encouraging reliance on the above alternatives: resource loading modification, dynamic emissions pricing, dynamic payment for cleaner generation and ancillary services, deeper integrations in resource planning, and time-of-use pricing. To the extent feasible in the scoping plan, ARB should consider how each of these policies may be

¹²

 $[\]label{lem:http://www.renewableenergyworld.com/articles/2016/02/fast-responding-energy-storage-digs-into-frequency-regulation-market.html$

http://www.utilitydive.com/news/aes-to-partially-replace-california-gas-plant-with-300-mw-of-battery-storag/423171/

implemented during the 2020–2030 compliance period. Where ARB does not have sole authority to implement a policy described here, the scoping plan hould describe a process by which ARB may consult with entities including but not limited to CAISO, the California Energy Commission, and the California Public Utilities Commission to further the development of these policies.

First, the **resource loading order** may be modified to prioritize technologies like demand response when demand is projected to cross a certain threshold. Recent research has suggested prioritizing this cleaner loading order on days of disproportionately poor air quality can dramatically improve air quality.^{14 15}

Second, CO₂ emissions associated with high levels of co-pollutants (such as the dirtier emissions of peakers), especially in environmentally stressed communities, could be priced in the carbon market in a manner that better reflects their full range of environmental and health burdens or otherwise requires additional demonstrations of environmental co-pollutant compliance before submitting carbon allowances. **Pricing adjustments** like these would reduce emissions-intensive operations over time and favor the development of cleaner generation technologies and the use of more efficient generation to charge grid-scale storage.

Third, resources that provide ancillary services from low- or zero-emissions technologies should receive **financial incentives for ancillary service provision** that better reflect both their grid benefits and their pollution benefits. This is especially pertinent as CAISO considers developing markets for frequency and voltage regulation.

Fourth, the three California power system management authorities should seek to eliminate silos between supply, demand, transmission, and generation planning, more **deeply integrating long-term resource planning**. The grid integration challenge requires that these authorities consider all potential resource types. ARB should evaluate the potential air pollution and health benefits of such coordination, and provide recommendations to the power system management authorities.

Fifth, California should seek to implement **full time-of-use pricing** and develop tariffs to benefit grid interactive distributed storage and EV technologies. By charging lower prices to consumers during off-peak times—or when renewables are available—California can use markets to encourage the adoption of more clean energy resources, relieving strain on the power grid during peak times. ARB should evaluate the potential air pollution and health benefits of such coordination, and provide recommendations to the power system management authorities.

In all, the proposed scoping plan should be intentional and specific about its plans for reducing

¹⁴ Krieger, et al. 2016.

¹⁵ http://www.sciencedirect.com/science/article/pii/S0301421513002346

demand for peakers. 16 Analysis by the UCS estimates that non-fossil solutions to grid flexibility can reduce curtailment by 77 percent, reduce emissions from electricity generation by 27 percent, and reduce the production cost of electricity by 25 percent compared to a 50 percent RPS base with flexibility provided by fossil fuel-driven sources of generation. 17 Our own analysis extends these findings to show that non-fossil grid flexibility would reduce NOx and SO_2 emissions, as well, with most of this reduction happening in environmentally stressed communities.

 ¹⁶ In addition to addressing the public health concerns discussed above, reduced use of peakers may also contribute to achieving SB 1383 (BAAQMD: Reg 11, Rule 18), which targets methane and black carbon.
 ¹⁷ Nelson, James H., and Laura M. Wisland. August 2015. "Achieving 50 Percent Renewable Electricity in California: The Role of Non-Fossil Flexibility in a Cleaner Electricity Grid." Union of Concerned Scientists.

Summary statistics for plants analyzed above

	(1)	(2)
	Non-peaker NG plants	Peakers
Operating hours/year	5799.52	955.95
	(2176.5)	(973.9)
MW generated/year	1.1e + 06	48334.08
	(615592.4)	(58832.2)
Capacity	180.01	49.78
	(77.08)	(27.35)
Year built	2005	2005
	(4.4)	(7.3)
N	77	113

mean coefficients; sd in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

California State Association of Counties®

April 10, 2017

Mary Nichols, Chairman California Air Resources Board Letter 172

1100 K Street Suite 101 Sacramento California 95814

916.327.7500

1001 "I" Street P.O. Box 2815 Sacramento, CA 95814

Re: 2017 Climate Change Scoping Plan Update: the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target and Draft Environmental Analysis

172-1

916.441.5507 Dear Chairman Nichols,

The California State Association of Counties (CSAC) appreciates the opportunity to provide comments on the California Air Resources Board (CARB) 2017 Climate Change Scoping Plan Update (Scoping Plan). CSAC recognizes the importance of assessing our current climate strategies, prioritizing goals that will help us meet our greenhouse gas (GHG) emissions reduction targets, evaluating how to align the state's GHG reduction strategies with other state policy priorities, and providing co-benefits, especially to disadvantaged communities.

State and Local Government Considerations

As noted in the Scoping Plan, counties and other local governments are taking action to reduce GHG emissions through local climate action plans, strategies to reduce energy use and promote renewable energy, land use plans and policies that reduce greenfield development and vehicle miles travelled (VMT), utilizing GHG-reducing techniques to maintain existing infrastructure, and other actions that directly contribute to statewide emissions reduction goals. CSAC supports the Plan's stated aim of helping to advance local efforts, while also recognizing the need to build on, and export this success to other regional and local governments through California and beyond. CSAC believes it is important for the state to recognize that realizing the aggressive goals for voluntary local action proposed in the Updated Scoping Plan will depend upon a robust and sustained effort by hundreds of individual cities, counties and special districts over many years. This sustained effort will require both direct state support and investment in programs at the local and regional level to reduce GHG emissions, and expanded support for effective statewide initiatives such as the Institute for Local Government (ILG) Beacon Program, which is rooted in local government and engages local community leaders, staff and stakeholders on an ongoing basis. ILG, the research and education affiliate of CSAC, the League of California Cities and the California Special Districts Association, works with local agencies and has invested significant staff and financial resources to pioneer a wide variety of best practices to reduce GHG emissions across a broad range of local functions. We believe that supporting this program and others like it will help local governments achieve greater GHG reductions in the long-term.

Waste Management

Counties recognize the potential for GHG emissions reductions from the waste sector and we appreciate the outline of the existing laws and mandates included in the Scoping Plan. Recently chaptered legislation, including SB 1383 (Lara, Chapter No. 395, Statutes of 2016) requires CARB by 2018 to adopt and implement a Short-Lived Climate Pollutant Strategy that will involve a 50 percent reduction in organic waste from our landfills from 2014 levels by 2020 and 75 percent by 2025. This

bill sets ambitious goals for the waste sector. CSAC recognizes and supports the need for a sustainable funding source and the development of additional waste infrastructure. However, we believe that the infrastructure to meet existing state goals and mandates is not expanding quickly enough to accommodate organics diversion targets and remains woefully inadequate. CSAC is committed to partnering with the state on this issue. However, we must stress that before any additional diversion requirements can be achieved from this sector, we must solve our critical funding and infrastructure needs.

Another challenge to building infrastructure is the lengthy timeline required for a composting or Anaerobic Digestion (AD) facility to be operational. "Siting and permitting" is terminology applied to the process by which additional infrastructure is established. For solid waste organics diversion infrastructure, this process is not just the formal process to apply for and issue permits but also includes other aspects which may overlap or be required prior to initiating the permitting process. These aspects include design, feasibility study for the new facility or expanded existing site, the Request for Proposal (RFP) process, establishing financing/rate structures and franchise agreements, identifying or expanding collection and processing/transfer capability, final design, and construction. Most importantly, siting and permitting does not move forward without local community support. To help local governments be successful in achieving our organic diversion goals, significant revisions to existing state requirements for siting and permitting organics processing/recycling facilities are necessary. In addition, there is a need for increases in market support for compost and renewable fuels (subsidies of bio-mass facilities much like wind and solar facilities).

Natural & Working Lands

Counties support the objective in the Natural and Working Lands section that outlines the goal of enhancing the resilience of and potential for carbon sequestration on (those) lands through management and restoration, and reducing GHG and black carbon emissions from wildfire and management activities. As you are aware, the Governor proclaimed a state of emergency in 2015 and articulated the need to protect life and property by mitigating the risk from falling trees and increased fire hazard by removing trees in the vicinity of critical infrastructure. CSAC, along with several of our member counties, is a member of the Governor's Task Force on this issue, and we are intimately aware of the risk posed by the nearly 100 million dead and dying trees throughout California. Continuing to address the tree mortality crisis in California through ongoing state agency coordination, dedicated resources, and state and local collaboration will be critical to mitigating the risk associated with wildfire emissions.

CSAC recognizes the tremendous effort required to update this comprehensive statewide plan to reduce GHG emissions, and we would like to commend CARB for its leadership on this important issue. Thank you for the continued opportunity to play an active role in this process. Should you have any questions or need additional information regarding our comments, please do not hesitate to contact Cara Martinson (916) 327-7500 ext. 504.

Sincerely,

Cara B. Martinson Legislative Representative

cc: Members, California Air Resources Board

Letter 175







April 10, 2017

Ms. Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

Submitted electronically via: https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

RE: California Air Resources Board's 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (January 20, 2017)

Dear Ms. Sahota:

Agricultural Council of California (Ag Council), California Farm Bureau Federation (Farm Bureau) and Dairy Cares appreciate the opportunity to submit comments on the California Air Resources Board's (ARB) 2017 Climate Change Scoping Plan Update (Proposed Plan), released on January 20, 2017. We thank ARB for the additional time to review the Proposed Plan and the efforts staff put into developing supplemental documents that flesh out the economic, environmental and AB 197 impacts. We also recognize the acknowledgement in Appendix E¹ that the economic analysis in ongoing and that additional information will be included in the final release of the 2030 Target Scoping Plan.

Our organizations strive to protect and improve the ability of farmers and ranchers engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of California's resources. California's natural and working lands can and do provide significant environmental and public health benefits and support state and local economies. As an essential part of California's farming heritage, our members understand the importance of protecting the land, water and air for their families, their communities and future generations.

2030 Strategy

The best path to achieve the state's climate change policies is through a comprehensive and flexible policy framework that will achieve cost-effective and technically feasible greenhouse gas (GHG) emissions reductions in all programs and sectors. Post-2020 emissions reductions will come at a much steeper level of decline and will be harder and more expensive to achieve. With

¹ https://www.arb.ca.gov/cc/scopingplan/app_e_economic_analysis_final.pdf (page 1)

the pursuit of the 2030 goal comes the responsibility to avoid stranded investments and negative local and state economic impacts. We believe the right mix of measures will safeguard jobs, protect consumers from higher energy costs and achieve the state's environmental goals.

Our organizations continue to have conversations with our members about what is the best scenario for how to achieve GHG reductions of 40 percent below 1990 levels by 2030. Based on the presentation from the March 28, 2017 workshop, the all cap-and-trade scenario provides the most cost-effective way to meet the compliance obligations imposed by AB 32, SB 32 and AB 197. However, staff indicated at the workshop that the all cap-and-trade scenario does not consider the directives from AB 197. We believe cap-and-trade and our known GHG commitments, including the Renewable Portfolio Standard and the Low Carbon Fuel Standard Program, drive direct emissions reductions at regulated facilities and can meet AB 197's intent. AB 197 does not change the primary purpose of AB and SB 32; it instead requires projects that also reduce criteria pollutants be prioritized. That can and should be accomplished without taking away from the state's existing climate change policies. The all cap-and-trade scenario ensures emissions reduction that are real, measurable and achievable while reducing the potential for both economic and emissions leakage.

While cap-and-trade seems to be the least harmful of the concepts described for how to reach our 2030 target, we continue to have important concerns that warrant further attention and review.

Post-2020 Framework & Potential Leakage

In the Executive Summary, staff describes the major elements of their Proposed Plan and design pieces of the post-2020 cap-and-trade program. Unfortunately, staff is still considering a redesign of the allocation strategy to reduce free allowances and decrease the offset usage limit.

The development of the post-2020 industry assistance factor calculations, based on the international and domestic leakage studies, is very problematic. Neither study looks at market demand when estimating leakage and they do not consider the uniqueness of producing food. We have found through our own independent analysis that there is a real possibility that as proposed cap-and-trade would increase emissions leakage. We urge ARB to reevaluate its assistance factor methodology and implement the cap-and-trade regulation in a way that more accurately portrays the international and domestic pressures on the California agricultural sector. Failure to minimize leakage will not just have direct consequences for California food processing, its employees, and the communities that it supports; it will have a negative impact on global GHG emissions. This outcome directly conflicts with ARB's original purpose of analyzing and minimizing leakage risk to the extent feasible.

Offsets Usage Limit

Staff is considering lowering the offset usage limit for post-2020. Offsets are a proven means of meeting AB 32 compliance obligations. They are also an effective method of achieving significant GHG emissions reductions here in California and globally, since carbon dioxide pollution knows no boundaries. ARB's original parameters that GHG reductions due to offsets meet the criteria of being real, additional, quantifiable, permanent, verifiable, and enforceable, have slowed growth of the program. For example, there are a limited number of approved protocols and the expense of verifying offsets can be cost prohibitive. As such, the program has not been as robust as it could be.

175-1

California is paving the way on climate change programs, and thus, is a global leader. However. Australia has 33 approved protocols. It would be interesting to learn from them how we can build a more successful program. We should not continue to restrain the ability of offsets to reduce emissions. There is a need to expand, expedite and develop additional protocols for activities such as, solid separation and conversion from flush to scrape or vacuum at dairies. It is critical that dairies are incentivized early to develop methane reduction projects consistent with SB 1383 and ARB's Short-Lived Climate Pollutant Plan.

AB 197 & Prescriptive Measures

AB 197 requires ARB to consider the social cost of carbon, to follow existing AB 32 requirements and to prioritize measures resulting in direct emission reductions. From the onset, AB 32 did not include prescriptive regulations and there are a multitude of comprehensive regulations already in place regulating criteria pollutants, their precursors, and air toxics. We believe these direct source rules are duplicative emission requirements and request that ARB conduct a thorough study of the current regulations to determine whether current federal, state and local regulations are adequate.

For example, California refineries are already the most efficient in the world, but now they must also implement fuel switching, boiler electrification and install more energy technologies on top of participating in the cap-and-trade program. If California refineries decide to stay in state, the costs of complying will be passed along to consumers, which include agriculture. We will have to absorb the increased costs of these changes. We see these costs play out in Table III-4 of the Proposed Plan under Estimate Cost of Prescriptive Measure. Based on the implementation of new direct facility mandates, the agricultural sector will see a total annual cost increase of \$800 million, which is the highest of any sector. The Proposed Plan attributes these increased costs to investments in efficient lighting, mitigation of agricultural methane and nitrogen oxide and increases in fuel costs due to higher electricity and liquid biofuel costs.

Farmers and food processors are subject to global commodity markets and cannot simply raise prices to cover costs. Many buyers of our products – big box, traditional grocery chains and restaurant chains – set the price they will pay our farmers. If California farmers cannot meet the price, the buyers can and do purchase agricultural products from other states and countries. These facts, along with increasing regulatory and labor costs, are driving family farmers out of business or out of the state and fueling a trend toward consolidation.

Peer Review

In the 2008 Scoping Plan, a peer review document was provided and gave valuable feedback when evaluating ARB's Initial Economic Analysis of the Scoping Plan. We urge ARB to include a similar level of review in the Proposed Plan that includes:

- · A cost of regulations in comparison to the cost of consumer goods
- · Impacts of increased energy costs
- Impacts on California's competitiveness
- · A cost-effective analysis
- Technology and commercial scalability

² https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf (page 68)

These environmental and economic points should be explored prior to the release of the final 2030 Target Scoping Plan.

Appendix D: PATHWAYS MODELING

Appendix D presents some of the ARB scenarios that have been taken and implemented by Energy and Environmental Economics, Inc. (E3) through the PATHWAYS model. Staff states that, "The modeling assumptions and results in this document are not intended to establish specific strategies or adopted targets for GHG emission reductions. Rather, the Scoping Plan shows the types of action the State must take in order to reach its GHG reductions goals." However, it seems that ARB is using this modeling to make the case for their proposed scoping plan scenario to achieve the 2030 goals. In the modeling of non-energy and non-CO2 GHGs, Appendix D4 lists a 65 percent reduce in manure methane emissions. This does not reflect Section 439730.7 (b)(1) of SB 13835 or the Short-Lived Climate Pollutants Strategy6 that has a goal to reduce dairy and livestock manure management methane emissions up to 40 percent.

Since it is stated that, "emission reduction categories in PATHWAYS do not correspond specifically to the sector targets outlined in SB 1383 and the SLCP Strategy," it would be helpful if an explanation could be provided as to why E3 used the 65 percent number and what the percentage is based on. These models appear to give a projection of what should happen or as stated, "one potential way to achieve the reductions," of 40 percent below 1990 levels by 2030. We ask for further discussion with stakeholders and that a 40 percent reduction assumption be used for modeling purposes.

Natural & Working Lands

In his January 2015 inaugural address, Governor Brown identified managing farms, rangelands, forests, and wetlands for carbon storage as one of five key climate change strategies. This policy objective was also codified through the passage of SB 1386 in 2016. The Proposed Plan focuses "renewed attention on California's natural and working lands and the contribution they make to meet the State's long-term goals for carbon sequestration, GHG reduction, and climate change adaptation." Increased emphasis on natural and working lands (NWL) is vital since they can provide critical carbon sinks.

We are highly encouraged to see the continued coordination that has been ongoing with ARB, USDA Natural Resource Conservation Service (NRCS), California Department of Food and Agriculture (CDFA) and other agencies. Going forward, more input data will be needed to get a clear baseline or target and that as policies are developed, it will be important to directly tie the GHG emissions reduction planning targets with funding and technical assistance availability.

Land Protection

³ https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf (page 1)

https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf (page 25)

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383

⁶ https://www.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf (page 63)

https://www.arb.ca.gov/cc/scopingplan/app_d_pathways.pdf (page 25)

⁸ https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf (page 107)

We agree with the addition of "protect" as one of three primary objectives in the NWL section. Avoiding the conversion of California's NWL both preserves the carbon sequestration potential of these lands and places an importance on restricting urban sprawl, which supports infill development and its benefits. These benefits are crosscutting, with the potential to reduce vehicle miles traveled as well.

On p. 107 of the Proposed Plan, we suggest that a *Potential Additional Action* be changed to read as follows: "Promoting stronger boundaries to suburban growth through enhanced support for sprawl containment mechanisms, including urban growth boundaries, and transfer of development rights programs, *and protection of natural and working lands.*"

Conclusion

We urge ARB to continue to add greater transparency and metrics into the final 2030 Target Scoping Plan. Additional tables that clearly express the cost-effectiveness, type of emissions reduction, benefit to disadvantaged communities and other factors would be extremely helpful. As written, the Proposed Plan does not provide a clear sense of priorities, timeliness, costs, funding needs, or benefits. It is also important that the Proposed Plan recognize the importance of reducing emissions with incentives while continually evaluating cost-effectiveness and feasibility. This is important for measuring accurate progress in meeting the state's goals as well as coordination between state agencies to avoid regulatory duplication. Please take into account the numerous other climate programs and mandates farmers are subject to, as this is just one piece of the larger climate narrative and farmers have made much progress related to on-farm conservation practices.

We look forward to continue to work with ARB staff to ensure California's climate change policy objectives are met, while maintaining and growing a robust food and agricultural economy. Should you have any questions or need anything further from us, please contact either Rachael O'Brien at (916) 443-4887 / Rachael@agcouncil.org, Cynthia Cory at (916) 446-4647 / ccory@cfbf.com or Michael Boccadoro at (916) 441-4383 / mboccadoro@westcoastadvisors.com.

Respectfully,

Emily Rooney

President

Agricultural Council of California

Guily Rooney

Cynthia L. Cory

Director, Environmental Affairs California Farm Bureau Federation

aprithe L. Cory

Michael Boccadoro
Executive Director

Dairy Cares



Letter 190

EXECUTIVE COMMITTEE

Bill Camarillo Agromin, Inc.

Greg Kelley Northern Recycling Compost

Eric Potashner

Greg Pryor Recology

Will Bakx

Sonoma Compost

Christy Pestoni Abreu UVR Compost

Michael Gross Z-Best Composting

LEGISLATIVE &
REGULATORY AFFAIRS

Neil Edgar, Executive Director Edgar & Associates, Inc.

Evan Edgar, Engineer Edgar & Associates

Justin Malan, Legislative Lobbyist EcoConsult

MEMBERS:

Agromin Atlas Disposal Burrtec Waste Industries Caglia Environmental California Wood Recycling CleanFleets net Clover Flat Compost Cold Canyon Compost Harvest Tulare Harvest Lathrop Marin Sanitary Service Mt. Diablo Recycling Napa Recycling Compost Northern Recycling Compost Organic Waste Solutions Phoenix Energy Quackenbush Mt. Compost Recology Blossom Valley Organics Recology Feather River Organics Recology Jepson Prairie Organics ReFuel Energy Partners Soiland Co., Inc. Sonoma Compost Tracy Delta Compos Upper Valley Recycling Vision Recycling Zanker Road Resource Management Z-Best Compost Facility Zero Waste Energy Development Zero Waste Energy, LLC

April 10, 2017

Mary Nichols, Chair California Air Resources Board 1001 "I" Street Sacramento, CA 95814

Re: Comments on the Draft Environmental Analysis for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target – Baseline Air Emissions from Covered Composting and Off-sets

Dear Ms. Nichols;

The California Compost Coalition (CCC) is a statewide organization representing operators of permitted facilities involved in the processing and composting of green and food waste materials throughout California. On behalf of these companies, we have already submitted comments on the December 2, 2016 Discussion Draft of the 2030 Target Scoping Plan Update and on the December 14, 2016 meeting on the Natural & Working Lands model. CCC supported SB 32 and SB 1383 and looks forward to the joint implementation of SB 1383 by CARB and CalRecycle in the regulatory process to divert 50% of all organics from landfill by 2020, and 75% of all organics by 2025.

CCC supports the overall vision and strategy set forth in the 2017 Climate Change Scoping Plan Update and the November 2016 draft of the Short-Lived Climate Pollutant Reduction Strategy, and appreciates that these plans have been linked. Both of these plans need to develop a sustained funding mechanism to develop the multibillion dollar infrastructure to develop over 100 facilities and to foster the use of compost on our working lands, with a focus on irrigated croplands. Composting and anaerobic digestion form the cement that binds the Governor's Five Pillars together. Eliminating organics from the landfills will mitigate methane generation as a shortlived climate pollutant to implement SB 1383 (Pillar 4), and instead, creates biomethane power at anaerobic digestion facilities to generate more renewable energy to achieve the goals of SB 350 (Pillar 2). Biomethane energy will also produce carbon negative fuel for the CNG fleets that collect the organics and implements the Low Carbon Fuel Standard to reduce petroleum use by 50% (Pillar 1) and transition from heavy-duty diesel trucks. The diverted food waste and digestate can be composted to sequester carbon and be integral to healthy soils (Pillar 5). Organic power and compost use have been deemed among the most cost-effective greenhouse gas (GHG) reduction strategies and bond all Five Pillars together. The California Legislative Analyst's Office determined the cost of composting and anaerobic digestion to be at just \$9/ton of GHG reduction while the overall average is \$57/ton.

1822 21st Street • Sacramento, CA 95811 • (916) 739-1200 • Fax: (916) 739-1216

Neil@californiacompostcoalition.org • www.californiacompostcoalition.org

The 2017 Annual Report on the Cap and Trade Dollars at Work show that the 100% of the grant dollars administrated by CalRecycle to develop the compost and AD infrastructure will benefit the disadvantaged communities. This is achieved by reducing methane, reducing emissions, and transitioning from heavy-duty vehicles to CNG trucks using renewable natural gas and near-zero low NOx engines.

Our comments below are in addition to the comments we posted on February 6, 2017, and will focus on covered compost facilities' emissions and baseline conditions with detailed data to support our comments. Our comments request that additional environmental analysis be conducted by CARB staff as part of this environmental review.

Comments on Section 3 Air Quality - ii. SLCP Measures

Operation of new green waste composting facilities could potentially increase VOC and PM emissions depending on the type of composting employed. These facilities could also cause other criteria pollutant emissions associated with the use of heavy equipment on-site (e.g., tractors, compost turners, and grinders) and from waste-haul truck traffic to and from the sites. Air quality impacts from the operation of digesters and associated equipment at composting facilities could potentially increase emissions. The quantity and type of emission increases would depend on the type of digester technology and the end use of the captured biogas and may include CO, PM, SOx, VOC, and NOx. Although there would be emissions associated with these sources at anaerobic digestion and composting facilities, the operation would divert organics out of landfills. As a result, there would be less mobile source at activity at landfills. Operation of digestion facilities could also help offset other emission sources by generating electricity or producing biogas as a substitute for fossil vehicle fuels.

The Environmental Analysis needs to recognize baseline conditions for organic waste management practices such as landfilling when assessing the emissions from composting and anaerobic digestion facilities. Page 62 (copied above) states that compost facilities could potentially increase VOC and PM emissions, but does not discuss the baseline conditions of these materials being landfilled, with methane and other associated landfill operations emissions. Since the SLCP measures are diverting food waste and green waste from landfilling, these baseline conditions need to be recognized where the net benefit of both greenhouse gas reductions and criteria pollutants can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities.

The Short-Lived Climate Pollutant Plan adopted by CARB on March 24, 2017, presents a scenario on page 126 on the number and type of facilities needed to divert 50% of the organics from landfilling by 2020, and 75% by 2025. CARB assumes that there will need to be 53 compost facilities by 2020 and 74 composting facility by 2025, with a throughput of 100,000 tons per year each — which is a reasonable assumption to conduct and environmental analysis. Keep in mind that the compost industry has moved beyond the existing windrow technology in place today, and that all new facilities will be covered aerated static pile facilities (CASP) using the best available control technology within the respective air district, and those emission factors should be used.

Baseline Landfill Emissions Conditions:

To assess the air quality impacts, these new CASP emissions from 53 to 74 new facilities can be compared to the landfilling baseline. Using standard industry practices, we have calculated that avoided landfill emissions of VOCs are 1.9 times greater that the VOCs emitted from CASP compost facilities. The net benefit of diverting organics from the landfill to CASP compost facilities is almost 2 times greater

190-1

than baseline conditions. The comments in the section copied above needed to reflect that only CASP composting will be utilized for new compost facilities, and that VOCs will not increase above baseline, but instead will be cut in half. Plus, the compost industry is in the midst of electrifying their off-road heavy-duty grinders and trommels, and that there will also be a new reduction in those emissions contrary to the statement copied above.

Landfill gas contains VOCs and NH3, which are emitted with fugitive landfill gas. The USEPA LandGem model is used to estimate landfill gas emissions and provides output including amounts of methane, carbon dioxide and NMOCs. This was used to derive the ratio of NMOCs to methane generation, which is 0.026 mass NMOCs/mass of methane at a concentration of 2,420 ppmv (AP-42, Chapter 2.4). Additionally, the fraction of NMOCs that is considered VOCs is 85% of the total NMOCs for co-disposal sites that accept residential and commercial/industrial waste. Therefore, the VOC content of landfill gas is (0.85)(0.026) = 0.0221 times the mass of methane.

Fugitive methane emissions can be estimated using the avoided landfill emission factor of 0.39 MTCO2e/ton organic feedstock for food waste and 0.21 for green waste (CARB, 2015) and multiplying the result by 16/44 and adjusting to short tons. Applying these factors results in avoided methane generation the resulting in avoided VOC emissions can be calculated. Using standard industry practices and an average of the composting emission that the local air district are using, we have calculated that avoided landfill emissions of VOCs are 1.9 times greater that the VOCs emitted from CASP compost facilities.

Compost Emissions Conditions Example in the SJVAPCD:

Each local air district has their specific compost emissions factors. Default VOC & ammonia emission factors are generally conservative and here we present a case study in the SJVAPCD, where ECS and others that do compost emission testing say that the real emission factors are much lower. It is possible to accept an Authority to Construct based on default emission factors with the understanding that emission testing after construction will be conducted, and based on those results the permit could be modified to allow more throughput.

Default VOC emission factors in the SJVAPCD are:

- 5.71 lb/ton of feedstock during composting and curing (uncontrolled emission factor)
- 0.2 lb/ton/day for feedstock storage
- It is assumed that 90% of VOCs are generated during active composting and that a finished compost layer will reduce emissions by 80%

A lower compost emission factor that is probably achievable is 2.5 lb/ton (this is uncontrolled).

VOCs from green waste composting has much lower ozone formation potential

VOCs from green waste composting are a diverse mixture, but comprise 80 - 95 percent low reactivity alcohols. The ozone formation potential of the total composting VOC mix is considered low, and is similar to other agricultural sources. The following phrase is from a peer reviewed journal article (A. Kumar et al. / Atmospheric Environment 45 (2011) 1841 - 1848). Overall, only around 10 % of the average VOC emissions were found to have medium to high potential for ozone formation.

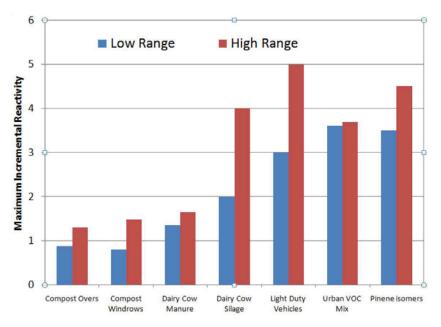
Full Citation: Volatile organic compound emissions from green waste composting:

190-1 cont Characterization and ozone formation Anuj Kumar a,1, Christopher P. Alaimo a, Robert Horowitz b, Frank M. Mitloehner c, Michael J. Kleeman a, Peter G. Green a,* Atmospheric Environment 45 (2011) 1841 - 1848

The following is from a report prepared by Professor Peter Green at UC Davis under contract with CalRecycle (December, 2010)

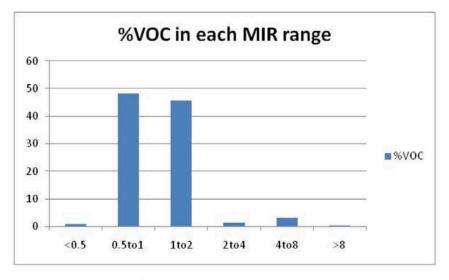
VOCs from green waste composting are a diverse mixture, but comprise 80 - 95 percent low reactivity alcohols. The ozone formation potential of the total composting VOC mix is considered low, and is similar to other agricultural sources. The Maximum Incremental Reactivity (MIR) scale is the most common scale used to compare the ozone formation potential of various compounds. Any compound or mixture with an MIR of less than 2 is considered to have low reactivity. The average MIR of all samples taken in Modesto was .95. The average MIR of all samples taken in Tulare was 1.13. The MIR of a typical urban VOC mixture is about 3.6.

Because the composting business model is based on low profit margin, high volume, and efficient production, strict air quality requirements could force some operators out of business. Losing organics processing facilities would undermine 20 years of work by CalRecycle and its predecessor agency to increase diversion of organic materials away from landfills and into more productive uses. Such a development would deprive farmers of affordable sources of compost, an important product for building soil health and ensuring food security. Compost is fundamental to organic crop production, and organic production is growing in terms of both acreage and total dollar value.



Average Maximum Incremental Reactivity (MIR) of various VOC sources.

190-1 cont.



190-1 cont.

Average contribution of VOC into the ozone formation according to their reactivity. (Urban VOC average is 3.6 to 3.7, depending on latest model revisions.)

Full citation:

An Investigation of the Potential for Ground-Level Ozone Formation Resulting from Compost Facility Emissions - December 2010, CalRecycle

Produced Under Contract By: Peter G. Green University of California, Davis School of Civil & Environmental Engineering

Comments on Section 3 Air Quality - ii. SLCP Measures

Because the implementation details of many of the methane measures identified in the SLCP Strategy depend substantially on the design of future incentive and regulatory programs, and upon local permitting decisions, long-term air quality impacts at this point are difficult to categorize with certainty. As described above, there are methods available to implement the identified measures that may have beneficial impacts on long-term air quality through the replacement of more-polluting emissions sources and fuels. Indeed, as a statutory matter, per SB 605, SB 1383, and AB 32, along with existing Health and Safety Code mandates for criteria pollutant planning, ARB will ultimately need to develop approaches to addressing these issues that ensure that air quality goals are achieved. However, for the conservative purposes of this programmatic analysis, ARB has also disclosed implementation choices that could substantially affect air quality.

190-2

CARB should prepare a Program EIR just for CASP Compost to unravel the mysteries and complexities expressed in the statement above. CARB will ultimately need to develop approaches, as each air district now has their own specific methodology, which are uncoordinated and stifling to the development of the CASP compost industry where 53 new facilities need to be developed by 2020, and 74 new facilities need to be developed by 2025. Instead, facilities may choose to quit composting due to complex and

expensive air permitting costs that do not recognize baseline conditions, and may revert to the baseline conditions of landfilling, which emit up to 1.9 times more VOCS than CASP composting.

190-2 cont.

Local Air Permitting:

Some local air districts are treating new covered aerated static pile (CASP) compost facilities, using the best available control technologies as a new source, as inferred in the statement above, where the cost of permitting and offsets can stop the development of the facility. This Environmental Analysis needs to recognize the net benefit of both greenhouse gas reductions and criteria pollutants can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities. The off-set costs for the typical 100,000 CASP compost TPY facility in each of the major air district are noted below based upon their emission factors and average cost per off-set.

BAAQMD			SCAQMD				SJVAPCD				
\$7,060 average off-set			I	\$22,246 average off-set				\$4,750 average off-set			
100,000 TPY			I	100,000 TPY				100,000 TPY			
\$473,161 costs			1	\$1,396,826				\$318,345			
l							ŀ				
Feedstock	VOCs	\$		Feedstock	VOCs	\$	l	Feedstock	VOCs	\$	
TPY	TPY	Offsets		TPY	TPY	Offsets	ı	TPY	TPY	Offsets	
12,950	10.00	0		6,000	4.00	0	l	12,950	10.00	0	
15,000	11.57	11,084		10,000	6.67	59,397	ı	15,000	11.57	7,458	
20,000	15.42	38,265		15,000	10.01	133,698	ı	20,000	15.42	25,745	
25,000	19.27	65,446		20,000	13.35	208,000	l	25,000	19.27	44,033	
30,000	23.12	92,627		25,000	16.69	282,302	l	30,000	23.12	62,320	
35,000	26.97	119,808		30,000	20.03	356,603	l	35,000	26.97	80,608	
40,000	30.82	146,989		35,000	23.37	430,905	l	40,000	30.82	98,895	
45,000	34.67	174,170		40,000	26.71	505,207	l	45,000	34.67	117,183	
50,000	38.52	201,351		45,000	30.05	579,508	l	50,000	38.52	135,470	
55,000	42.37	228,532		50,000	33.39	653,810	l	55,000	42.37	153,758	
60,000	46.22	255,713		55,000	36.73	728,112	ı	60,000	46.22	172,045	
65,000	50.07	282,894		60,000	40.07	802,413	l	65,000	50.07	190,333	
70,000	53.92	310,075		65,000	43.41	876,715	l	70,000	53.92	208,620	
75,000	57.77	337,256		70,000	46.75	951,017	l	75,000	57.77	226,908	
80,000	61.62	364,437		75,000	50.09	1,025,318		80,000	61.62	245,195	
85,000	65.47	391,618		80,000	53.43	1,099,620	l	85,000	65.47	263,483	
90,000	69.32	418,799		85,000	56.77	1,173,921		90,000	69.32	281,770	
95,000	73.17	445,980		90,000	60.11	1,248,223		95,000	73.17	300,058	
100,000	77.02	473,161		95,000	63.45	1,322,525		100,000	77.02	318,345	
				100,000	66.79	1,396,826					
			\perp				\perp				

190-3

190-3

cont.

BAAQMD \$475,000 in off-set costs per 100,000 TPY CASP compost facility
SCAQMD \$1,400,000 in off-set costs per 100,000 TPY CASP compost facility
SJVAPCD \$320,000 in off-set costs per 100,000 TPY CASP compost facility

A geographic siting of 53 new CASP composting facilities by 2020 in these 3 districts could costs about \$40 million in off-sets.

A geographic siting of 74 new CASP composting facilities by 2025 in these 3 districts could costs about \$54 million in off-sets.

To assess the air quality impacts, these new CASP emissions from 53 to 74 new facilities can be compared to the landfilling baseline and not be considered a new source, that could cost up to \$54 million in off-set costs while reducing VOCs by almost half from baseline conditions.

We appreciate the recognition of the beneficial impacts on long-term air quality mentioned in the statement above, but the analysis then notes there could be choices which substantially affect air quality. This Environmental Analysis needs to recognize the net reduction, with a macro analysis, that both greenhouse gas and criteria pollutants reductions can be demonstrated when diverting green waste and food waste from landfills to composting and/or anaerobic digestion facilities. With respect to criteria pollutants, the covered aerated static pile compost systems have been shown to reduce VOC emissions by over 80% with the use of biofilters, which should be compared to the baseline landfill system.

CCC supports the overall vision and strategy set forth in The 2017 Climate Change Scoping Plan Update and the November 2016 draft of the Short-Lived Climate Pollutant Reduction Strategy and appreciates that these plans have been linked. CCC respectfully requests that CARB further evaluate our recommendations to fully close the loop on recycling and composting with waste diversion to compost use in the one of the most recognized cost-effective GHG reduction measures available:

Should you have any questions, please contact me at (916) 739-1200.

Sincerely,

Evan W.R. Edgar Regulatory Affairs Engineer

wan MR YSR

cc: Scott Smithline, Director, CalRecycle



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

April 10, 2017

Letter 191

Clerk of the Board Air Resources Board 1001 | Street Sacramento, CA 95814

Filed Electronically

RE: TID Comments on 2017 Climate Change Scoping Plan Update

Turlock Irrigation District ("TID") submits the following comments on the 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target ("Draft Scoping Plan") and Draft Environmental Analysis ("EA").

191-1

Upon review of the *Draft Scoping Plan* and subsequent refinements conducted by the ARB Staff of the greenhouse gas ("GHG") and air quality, health impacts, and economic impacts analyses of the examined scenarios, TID supports adoption of the Proposed Scoping Plan Scenario ("Proposed Plan").¹ TID believes that the Proposed Plan's strategy to extend the current Capand-Trade Program post- 2020 and continue efforts to achieve the policy mandates for emissions reductions set forth in existing policies and programs is a cost effective means of achieving the goals of Senate Bill ("SB") 32. We also believe this strategy will minimize cost impacts on the disadvantage communities that TID serves. Further, TID encourages the ARB to continue to recognize that transportation electrification will be a critical component of attaining the 2030 emissions goal, and the role that Electrical Utilities play in that effort be considered. Also, TID encourages harmonization between the ARB, CPUC and CEC when setting the Electric Sector goals in regards to the SB 350 IRP process. There must be clarity, consistency and coordination in the development of GHG planning targets and the signals the cap-and-trade sends.

I. TID Background and Service Area

TID was organized as the first Irrigation District in California on June 6, 1887 and is beginning its 130th year of operation. TID currently serves a retail electric customer base of just over 100,000 customers and provides irrigation water to over 5,800 growers and nearly 150,000

¹ See, Draft Scoping Plan, Section II.



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

acres of farmland. Of the 11 communities that TID serves, seven are classified as Disadvantaged Communities pursuant to Senate Bill 535. TID is also one of only six Balancing Authorities in California, tasked with balancing retail demand, generation, and wholesale purchases and sales while providing adequate reserve capacity to maintain reliability.

TID's mission is to provide stable, reliable, and affordable water and power to its customer owners, be good stewards of our resources, and provide a high level of customer satisfaction. TID has a long history of environmental stewardship, beginning when the District was formed. TID is the majority owner and project manager of the Don Pedro Dam and powerhouse, providing irrigation water and 203 megawatts, or approximately 400,000 megawatt-hours of emissions free energy to our customers, while providing flood control and environmental benefits for the region. TID has also made considerable investments in Renewable Portfolio Standard ("RPS") eligible resources, and has balanced these investments with its North American Electric Reliability Corporation ("NERC") regulatory obligations by procuring a geographically diverse renewable generation portfolio. TID's status as a balancing authority creates operational and regulatory limitations on its ability to change the use of its fast-starting natural gas facilities and integrate intermittent renewable generation inside of its Balancing Authority.

II. Concerns with Identified Alternative Scenarios

TID appreciates ARB Staff's responsiveness to stakeholder concerns, particularly Staff's analysis of the GHG and air quality, health impacts, and economic impacts of the Proposed Plan and alternative scenarios. Since ARB's health impact analyses indicate that the estimated health impacts from the Proposed Plan and alternative scenarios are fairly similar,² these comments primarily focus on the potential economic impacts of the alternative scenarios. As noted above, we are particularly sensitive to the potential rate impacts the various alternatives may have on TID's ratepayers in disadvantaged communities.

Since the majority of TID's ratepayers are in disadvantaged communities, TID cannot easily isolate rate impacts from being borne by these communities in the same manner that other utilities can through low income programs (e.g., CARE). TID is concerned that a fundamental shift in policy—such as that contemplated by three of the four alternative scenarios — resulting

² See ARB Staff's March 28th Workshop Presentation on the 2017 Climate Change Scoping Plan Update ("March 28th Workshop Presentation"), Slide 18, available at https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf.



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

in detrimental economic impacts would severely impact these ratepayer owners. Ratepayers in disadvantaged communities tend to pay relatively more for electricity compared to higher income areas because electricity bills are a higher percentage of their total income. In other words, the ARB's analysis under Assembly Bill ("AB") 197 should not only include a consideration of emissions impacts, but also the programmatic cost impacts of climate change policies.

A. Alternative 1: No Cap-and-Trade

TID has three primary concerns with Alternative 1: No Cap-and-Trade ("Alternative 1"): an increased

Renewables Portfolio Standard ("RPS") requirement beyond 50 percent;³ high economic costs;⁴ and the lack of funds generated for the Greenhouse Gas Reduction Fund ("GGRF"),⁵ all of which may have a disproportionate financial impact on low income households and disadvantaged communities.

Due to operating its own balancing authority and needing to supply a balanced energy supply and demand within the balancing authority, TID faces unique challenges. A small balancing authority is unsuitable for high concentrations of intermittent renewable generation, such as that which might result from an increased RPS requirement beyond 50 percent. TID has therefore focused RPS investments outside of its balancing authority, which leads to transmission related costs for out-of-state resources or wheeling charges for resources located in the California Independent System Operator ("CAISO") balancing authority area. While TID is planning for a smooth transition to a 50% RPS, a new aggressive RPS target could lead to considerable rate impacts on TID's ratepayer owners. For this reason, Alternative 1 is not a cost-effective means of reducing GHG emissions when compared to the Proposed Plan.

191-1

The other potential negative impacts of Alternative 1 are demonstrated by the significant economic impacts of Alternative 1, particularly the high direct costs. Moreover, Alternative 1 will not produce any GGRF funds that can be used for programs to offset these direct costs and benefit Disadvantaged Communities. Currently, the communities served by TID are direct recipients of GGRF funds through the Low Carbon Transit Operations Program ("LCTOP"), which is administered by the California Department of Transportation in coordination with ARB and the State Controller's Office. The LCTOP provides funding assistance for projects that reduce

³ See, Draft Scoping Plan p. 49; also see March 28th Workshop Presentation, Slide 7.

⁴ March 28th Workshop Presentation, Slides 23, 26, and 30.

⁵ See, Draft Scoping Plan p. 50.

⁶ March 28th Workshop Presentation, Slides 13, and 30.

⁷ The designated recipient of LCTOP funds for the Stanislaus region is the Stanislaus Council of Government ("StanCOG"). For example, see *Staff Report* FY 2016/17 Low Carbon Transit Operations Program (LCTPO) Project Funding, p. 1, available at http://www.stancog.org/pdf/committees/tac-cpc/2017/mf-20170302-agenda.pdf.



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

GHG emissions, with a requirement that a minimum of 50% of total funding received must be used for projects that benefit disadvantaged communities. Such funds will no longer be available to benefit Disadvantaged Communities if Alternative 1 is selected. For these reasons, TID does not support Alternative 1.

191-1 cont.

B. Alternative 2: Carbon Tax

TID is concerned by the significant cost impacts that ARB Staff projects for Alternative 2. TID understands that for the purposes of Staff's economic impacts analyses, the modeling set the carbon tax at the US Environmental Protection Agency's social cost of carbon -- \$50 per metric ton in 2030.9 However, both the Draft Scoping Plan and Staff's March 28th Workshop Presentation acknowledge that setting the "right price" of the carbon tax is difficult.¹⁰ The Draft Scoping Plan further acknowledges that it is unclear how the tax would be applied—for example, whether the tax would be adjusted annually, be applicable to all sectors, or whether certain sectors would be exempted from the tax to address emissions leakage, trade exposure concerns, or minimizing costs of operating critical infrastructure (e.g., power plants needed to maintain system reliability).¹¹ TID is concerned with the potential impacts of such regulatory ambiguity on utility planning and the costs such high carbon costs would have on ratepayers. For example, TID must meet specific federal and state requirements for grid reliability within its Balancing Authority Area. To help meet these requirements, TID not only procures resources, both renewable and conventional fuel-fired resources, as needed, but also owns and operates its own generating facilities. Ambiguities in the yearly carbon tax will make long-term planning for the operational costs of those generating facilities very difficult. Further, carbon tax increases needed to realize emissions reduction goals would lead to further uncertainty for ratepayers. In short, TID is considered that Alternative 2 is not a cost-effective means of accomplishing the state's environmental goals when compared to the Proposed Plan. There is also no certainty that emissions reductions will actually occur with Alternative 2. Therefore, TID does not support Alternative 2.

191-2

C. Alternative 3: All Cap-and-Trade

In terms of potential economic impacts to ratepayers, Alternative 3 appears commensurate with the Proposed Plan, if not slightly better. At the March 28th Workshop, ARB Staff stated that Alternative 3 is not as responsive to AB 197. TID encourages the ARB to continue to rely on the Cap-and-Trade as the primary mechanism for meeting the SB 32 targets, and supports the Proposed Plan TID continues its commitment to working with ARB Staff to ensure that the Cap & Trade and Mandatory Reporting Regulations continue to provide meaningful emissions

191-3

⁸ See, for example, http://www.stancog.org/pdf/committees/tac-cpc/2017/cac-01-04-2017.pdf.

⁹ Note: in \$2007. See, March 28th Workshop Presentation, Slides 7, 27.

 $^{^{\}rm 10}$ See, Draft Scoping Plan p. 50; also see March 28 $^{\rm th}$ Workshop Presentation, Slide 7.

¹¹ See, Draft Scoping Plan p. 51.



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

reductions in the most *cost effective* manner. In addition, the ARB should consider program cost impacts as a key consideration of Alternative 3.

191-3 cont.

D. Alternative 4: Cap-and-Tax

TID has extensive concerns with the high direct costs of Alternative 4: Cap-and-Tax ("Alternative 4"). (See, March 28th Workshop Presentation on the 2017 Climate Change Scoping Plan Update, Slides 8, 29, & 30.¹²) As stated throughout these comments, the majority of TID's ratepayers are located in disadvantaged communities, and may be disproportionately affected by a fundamental shift in policy, such as a change to a Cap-and Tax program as contemplated by Alternative 4. The potential negative changes to employment figures and personal income estimated by ARB Staff from Alternative 4 are significant, and TID is concerned that such changes will disproportionately impact disadvantaged communities. Therefore, TID does not support Alternative 4.

191-4

III. Transportation Electrification

TID is encouraged that ARB recognizes transportation and industrial electrification as key components in meeting the ambitious 2030 emissions reductions goals in the Scoping Plan. Utilities will play an important role in realizing this transition. TID is concerned, however, that the ARB has not yet developed a methodology that will ensure that utility ratepayers aren't unduly burdened by the increased demand and commensurate emissions costs placed on electric utilities. A supplemental cap-and-trade allocation process based on individual, verified meter data is infeasible. TID recommends that the ARB work with the LCFS program staff to build on the load estimation modeling that the LCFS program uses. TID looks forward to working with the ARB staff and other utilities on a EV methodology in a future cap-and-trade rulemaking.

IV. GHG Goal setting, SB 350 harmonization

SB 350 directed the ARB to establish load serving entity specific GHG targets for the purposes of developing IRPs. 13 TID encourages the ARB to actively engage with the Energy Commission and

 $^{^{\}rm 12}$ March $\rm 28^{\rm th}$ Workshop Presentation, Slides 8, 29, and 30.

¹³ California Public Utilities Code §454.52(a)(1)(A) provides that load-serving entities must "meet greenhouse gas emissions reduction targets established by the State Air Resources Board, in coordination with the commission and the Energy Commission, for the electricity sector and each load-serving entity that reflect the electricity sector's percentage in achieving the economy-wide greenhouse gas emissions reductions of 40 percent from 1990 levels by 2030."



333 East Canal Drive • P O Box 949 • Turlock, CA 95381-0949

the Public Utilities Commission, as they have both opened proceedings in regards to establishing LSE specific targets for the IRP process. These "soft" targets must be consistent with the Electric Sector targets within the 2030 Scoping Plan, and TID recommends that there be a range built in to the targets that take into account the myriad efforts of utilities to reduce emissions (RPS, etc.), and the inherent variability that utilities plan for, but have no control over (e.g., load, hydro, wind, solar, etc.).

V. Conclusion

TID supports the state's greenhouse gas reduction goals. The policies set forth in the Scoping Plan must strike an appropriate balance between the state's environmental goals and economic impacts. TID appreciates the ARB's sensitivity to the utilities' responsibility to provide reliable power in a cost-effective and environmentally friendly manner. The Proposed Plan strikes an appropriate balance of costs and meeting policy objectives, which are not met by any of the alternative scenarios. TID supports adoption of the Proposed Plan, but believes that more work is needed to better understand and address the unique role the electricity sector will play in achieving the SB 32 emission reduction targets. In particular, the ARB should address the ARB's role in electrifying the transportation and industrial sectors in the context of a subsequent capand-trade rulemaking. In addition, the IRP planning targets must be carefully crafted to achieve a clear set of soft targets that are consistent with both the Scoping Plan process as well as the cap-and-trade. TID looks forward to continuing to work the ARB to help achieve the State's GHG targets in a way that minimizes costs for ratepayers.

Sincerely,

Dan B. Severson

Turlock Irrigation District

Letter 192

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY · DAVIS · IRVINE · LOS ANGELES · MERCED · RIVERSIDE · SAN DIEGO · SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

Barbara Haya, PhD Research Fellow Berkeley Energy & Climate Institute University of California, Berkeley 454 Sutardja Dai Hall Berkeley, CA 94720 bhaya@berkeley.edu

April 10, 2017

RE: Comments on Scoping Plan draft – In support of a smaller carbon offset program and not adopting a credit-based REDD program

Dear ARB staff and board,

Thank you for the multiple opportunities to comment on the draft scoping plan. Thank you also for your hard work and tenacity taking on substantial greenhouse gas emissions targets and the policies to achieve them. At this political moment I feel very lucky to live in California, in large part because of the strong policies California has adopted.

These comments focus on California's offset program and support ARB's decision to substantially shrink the size of the program.

If the 8% offsets limit were to continue through 2030, offsets would remain a substantial portion (around one third) of the state's efforts to reduce emissions toward its 2030 target and could make up all of the reductions that would occur directly by the cap-and-trade program.

These reductions from California's offset program are inherently uncertain; some amount of overcrediting is very likely, and it is possible that a large portion of credits generated do not represent real additional reductions. Most of ARB's offset protocols target project types that were being built to some extent without offset credits. Such business-as-usual (BAU) projects are non-additional but qualify to participate in ARB's protocols. The effects of many technology support programs, including utility efficiency programs, are assessed using net-to-gross ratio analysis, which is used to estimate the proportion of projects participating in an incentive program that were actually enabled by the incentive program. ARB, however, does not assess the proportion of offset projects that are additional. The failure to include such an analysis means that a non-zero but unknown portion of projects generating credits under the various protocols are non-additional. Further, it can be difficult to discern the effect of the incentive of the protocol on new project development from what would have happened without the incentive. Even when a net-to-gross ratio analysis is performed, an inherent challenge of offsets is that they allow a known quantity of emissions to be emitted above the cap in the capped sectors to be offset with an uncertain quantity of reductions outside of the cap.

1/13

A second challenge inherent to offsets is that they can create perverse incentives that can inadvertently lead to emissions increases. By paying for reductions, offsets create a new source of profits for facilities that emit greenhouse gasses. This can create an incentive to increase emissions in order to decrease them, such as by improving the economics of high emitting activities like coal mining, or by creating disincentives for other governments to regulate emissions. These perverse incentives mean that offsets can cause more harm than good.

The risk of over-crediting and harm is much greater with international REDD programs. These risks include displacement or dispossession of forest communities which has been widely documented with pilot REDD projects and programs, leakage of deforestation to areas outside of the REDD project, crediting business-as-usual reductions in deforestation rates, crediting incremental changes in deforestation rates that only postpone deforestation rather than address the long-term drivers of deforestation, double counting across multiple funding sources, creating a weak precedent for international cooperation under the Paris Agreement by allowing two obligations to be traded off of one another - reducing emissions and supporting emissions reductions in poorer countries, and increasing volatility in the state's carbon market. Policies that avoid these risks and meaningfully lead to long-term permanent carbon storage and positive outcomes on local communities are difficult to assess from far away. While supporting jurisdictions that meaningfully reduce tropical deforestation is tremendously important for carbon, biodiversity, and livelihood reasons, a program that trades reductions in the global North for an uncertain quantity of reductions in tropical deforestation weakens climate mitigation efforts and risks harm to forest communities. Instead, we need an agile funding program based on a deep understanding of what is happening on the ground and the ability to adapt the funding program to that understanding, combined with reducing the largely international drivers of deforestation, to make a positive difference in tropical deforestation and in global greenhouse gas emissions.

Offsets also weaken ARB's efforts to design a model climate policy in several other ways. So far, offsets have allowed the price of carbon created by California's cap-and-trade program to remain far below both the social cost of carbon and levels needed to drive meaningful reductions. California's expectation of a substantial use of offsets to meet the 2020 and 2030 targets have also weakened California's potential to demonstrate a vibrant, low-carbon economy on a solid path towards close-to-zero emissions that are needed in all areas of the world by 2050.

One possible alternative cost-containment mechanism that could replace offsets in full or part would be to make allowance credits available at a ceiling price level, expanding the existing containment reserve system. The funds generated could then be invested in a wide range of activities that reduce emissions, which could possibly include technologies and activities currently targeted by the offset program.

Below I expand on these points, drawing from previous comments submitted.

1 The 8% offset limit is a large proportion of reductions required in California

If the offset limit were to continue to equal 8% of emissions through 2030, the limit would equal around one third of cumulative reductions required in California during 2021 to 2030. It would be more than the total reductions expected to result from the price of carbon created by the cap-and-trade program itself.

The 8% offsets limit equals a large portion of total reductions expected through 2020, and would continue to be a large portion of reductions if extended through 2030. While "8% of compliance obligations" might not sound like a large quantity, it is important to remember that an emitter's compliance obligation equals its total emissions (not the required reductions) since each emitter has an obligation to hold allowance or offset credits equal to its total emissions.

For 2021 to 2030, ARB estimates that the total reduction needed in California as 680 million tonnes of CO₂-equivalent (MTCO₂e). If the maximum limit on the use of offsets continues to be 8% of compliance obligations, and if the cap were to cover 77% of California emissions (as is expected in 2020) and decline linearly from 2020 to 2030, then maximum offset use would equal almost a third of all California-wide reductions needed in that period. The quality of the credits generated under the offset program would play a large role in determining the success of California's efforts to reduce emissions.

Through 2030, ARB expects other core measures (complementary measures) to achieve 490 MT CO2e in cumulative reductions and the cap-and-trade program to achieve the remaining 191 MT.² An 8% maximum allowed use of offsets would equal more than the total reductions expected from the cap-and-trade program itself.

Similarly, during 2013 to 2020, assuming that no containment reserve credits are used, the 8% offset limit equals around half of total cumulative reductions, and more than the total reductions expected directly from the price of carbon created by the cap-and-trade program.³

2 The quantity of reductions resulting from California's offset program is uncertain and most likely higher than reductions achieved

Under the UN's offset program—the Clean Development Mechanism (CDM)—the majority of participating projects is understood to not represent real additional emissions reductions. While California has adopted a more promising approach to offsets, the challenges that so weakened the CDM are fundamental risks for any offset program, including California's. Offsets replace certain

January 2017 draft Scoping Plan

² Figure II-2 of the January 2017 draft Scoping Plan.

³ See Haya, B. 2013. California's carbon offsets program - the offsets limit explained, http://bhaya.berkeley.edu/docs/QuantityofAB32offsetscredits.xlsx, for detailed calculations.

reductions under the cap with an uncertain amount of reductions outside of the cap. The quantity of reductions resulting from an offset program is uncertain for two main reasons.

First is additionality. Under the CDM, the majority of projects generating credits are most likely non-additional (Haya 2009). Instead of reducing emissions in developing countries the majority of CDM offset funds paid project developers to build projects they were already building. While the CDM certainly did have some influence on project development, its effect on emissions was only a portion of the reductions claimed and credited (Haya 2009, He & Morse 2010, Wara 2008). This means that countries and companies exceeded their emissions limits, but without reducing equivalent emissions elsewhere, weakening countries' Kyoto Protocol targets.

ARB has decided to address additionality with a common practice test. Only project types that are not common practice are allowed to participate. Even if the project types are not common practice, most of the protocols ARB adopted credits activities that were already being built each year on their own before the offset program was implemented. Going forward, new projects that would have been built regardless of California's offset program can now generate credits.

To assess the effects of a program supporting the deployment of a technology, it is common for program evaluators to estimate the portion of total technology deployment due to the program, taking into account the amount of development that would likely have occurred without the support program. In utility-run efficiency programs this is called net-to-gross ratio assessment. ARB is not performing such an analysis, and instead assumes that all projects registered under its offset program would not have happened without the offset income (are additional), an assumption that is unrealistic since most project types were being built without offsets before California's offset program. ARB is therefore allowing the generation of credits from some portion of non-additional activities, an amount of over-crediting that has not yet been assessed.

California's Forest Projects, Livestock Projects, Mine Methane Capture Projects, Rice Cultivation Projects, and Urban Forest Projects protocols credit activity types that were already occurring to some extent without the offset program. The annual rate of implementation of livestock digesters in the United States decreased rather than increased since California's livestock protocol was adopted. Without assessment of the industry, the net effect of the program on project development is wildly uncertain. California's Forest protocol allows forest owners of forests holding more than the average for the forest type to generate offset credits. But approximately half of all US forest land holds more than the average already. One assessment of the Forest protocol suggest that the protocol is more likely to reward forest owners who are already managing their lands to hold more than average carbon rather than to change land management decisions (Kelly & Schmitz 2016).

Even if ARB were to perform a net-to-gross ratio assessment of the effect of the offset program on emissions, such an assessment is not very accurate. Inherently, offsets allow for a known quantity of emissions to be emitted above the cap in the capped sectors, in exchange for an uncertain amount of reductions outside of the capped sectors.

3 Offsets can create perverse incentives to increase emissions

A second risk posed by offsets is that providing a new source of profits for specific project types eligible for offset sales could create perverse incentives that lead ultimately to emissions increases. For example, due to the very high global warming potential of HFCs, the CDM created the incentive for refrigerant manufacturers to produce more refrigerants than they otherwise may have and in a less efficient manner, so they could maximize the amount of HFC byproduct they destroyed for large offset profits (Wara 2008, Schneider & Kollmuss 2015). Under California's offset program, there is a potential for California's offset program to create profits large enough to change business decisions in the facilities implementing the projects. When the underlying products, like coal and livestock, are more emissions intensive than their alternatives the offset program can thus lead to net increases in emissions. For example, the profits from the sale of offsets from the flaring of methane and the country's gassiest mines could potentially be large enough to allow a struggling mine to remain open longer than it otherwise would have (Haya et al. 2015). As another example, we understand that the U.S. Bureau of Land Management has been taking California's offset program into account in their decision whether and how to regulate or incentivize methane capture from coal mines on federal lands. Since regulation requiring such capture would prevent regulated mines from participating in California's mine methane capture protocol (a technology that is required by law can not be considered additional), California's protocol may result in a weakening of federal regulation compared to what would have happened without the offset program. These potential effects are inherent to offsets, could have a deleterious effect on emissions that can be hard to identify and

192-1

In sum, the reductions of any offset program are uncertaindue to uncertainty in the proportion of non-additional projects. In addition, offsets could risk generating profits large enough to increase production of high emitting products. These effects are hard to accurately assess and prevent. Allowing offsets to meet a large portion of California's reduction target puts into question whether California has met its target.

4 Carbon prices need to be higher to drive substantial reductions and to reflect the social cost of carbon

The main function of offsets is cost containment. But to drive reductions, allowance prices need to rise. A number of modeling studies predict that carbon prices could need to rise well above \$50 per tCO₂e for the carbon price itself to make a substantial contribution towards meeting California's 2030 target (Borenstein et al. 2014, Regional Economic Models Inc. (REMI) 2014, McCollum et al. 2012).

Also, the cost on society for each tonne of carbon dioxide-equivalent emitted (the social cost of carbon) is much greater than today's allowance prices. Three integrated assessment models have been used to estimate the global social cost of carbon. The average values they have generated, using

5/13

⁴ This statement was made during a public presentation: BLM update on Waste Mine Methane given by Mitch Leverette/Bill LaSage, Bureau of Land Management, at the 2014 U.S. Coal Mine Methane Conference, held by the US Environmental Protection Agency's Coalbed Methane Outreach Program, November 18-19, 2014, Pittsburgh, PA.

different discount rates, range from \$12 to \$128 per tCO2e (US Environmental Protection Agency 2013 (revised 2015)). The actual social cost of carbon in California should be higher than these values for two reasons. First, these values only include damages that were monetized by the models and leave out important damages that have not yet been monetized (effectively treating these damages has having zero cost). Examples of damages left out of the models are the effect of climate change on conflict and the effect of ocean acidification (Anthoff & Tol 2013). Second, the value of life and wellbeing of a poor person are considered by these models to be less than the value of a wealthy person's life. This is because sickness or mortality of a poor person has less absolute impact on global GDP than that of a wealthy person. The ethical challenge of treating different people's lives and wellbeing as having different value while assuming the cost per tonne CO2 they emit is the same can be remedied with an equity-weighted social cost of carbon. Under an equity-weighted model, the social cost of carbon would be higher for countries with greater per capita wealth, better reflecting the different value of money in different countries. One of the three models (FUND) was run with such equity weighting. Under this run, the social cost of carbon in the United States was two to eight times higher than the non-equity weighted estimate, depending on the equity principle used (Anthoff & Tol 2010).

5 California can play an important role globally as a wealthy advanced economy that reduces emissions substantially through 2030; a large offset program would weaken our policy's value as a model

Around the world, jurisdictions need to reduce emissions substantially and quickly. Putting our global warming law in the context of the international climate agreements, wealthy countries have a dual obligation to reduce their own emissions, and to support reductions in poorer countries. California has the potential to implement a model set of climate policies and demonstrate how a wealthy advanced economy can substantially reduce its emissions. If we meet a large portion of our reductions by buying offset credits that represent a questionable amount of reductions from out-of-state, the message we are sending to the rest of the world is that a low carbon economy reflecting the reductions needed to keep global temperatures in a range considered relatively safe is too expensive.

6 ARB should not consider adopting a credit-based REDD program

Overall, a credit-based REDD program as California proposes comes with high risk of generating credits without actual permanent reductions, of making California partially responsible for harm to forest communities, and of increasing volatility in the state's carbon market. Alternative methods of supporting reductions in tropical deforestation would likely be more effective and involve less risk.

POOR RESULTS FOR FOREST COMMUNITIES AND THE WEAKNESS OF SOCIAL & ENVIRONMENTAL SAFEGUARDS

REDD is being considered for implementation in forest areas where people live, following, in most forested areas of the tropics, a long history of contested extraction and displacement and

6/13

dispossession of communities living in the forests (Larson & Ribot 2007). When programs are implemented in the context of large imbalances in wealth and power, more likely than not, those who are better able to capture the program benefits will, at the expense of those less able to. So the outcomes of REDD projects and programs so far are not surprising.

Case studies from over the world have documented how REDD programs have lead to displacement and dispossession of forest communities, in Brazil, Cameroon, Ethiopia, Indonesia, Laos, Madagascar, Nigeria, Tanzania, Vietnam and elsewhere (e.g. Ingalls & Dwyer 2016, Corson 2011, Pokorny, Scholz & de Jong 2013, Kelly & Peluso 2015, Beymer-Farris & Bassett 2012, McElwee 2016, Asiyanbi 2015, Osborne, Bellante & Hedemann 2014). These studies and others document how REDD policies often do not address the main drivers of deforestation, like beef, soy, and timber harvesting, but instead target small holders, which is politically easier. This has led to restrictions of their traditional and livelihood uses of the forest, while REDD benefits go to larger players (e.g. Osborne et al. 2014, Ingalls & Dwyer 2016). Creating new conservation areas also often involves dispossession of forest communities (e.g. Kelly & Peluso 2015, Corson 2011). Even in Acre, indigenous communities have blamed the government for inadequate consultations, forced dispossession (restricted use of the forest for subsistence agriculture), and violence against those protesting the REDD program (Faustino & Furtado 2014).

Some of these studies describe jurisdictional REDD programs which involve multiple programs and government policy (Acre, Brazil; Cross River State, Nigeria) and some of these studies describe REDD projects of the type that are expected to be a part of an expanded jurisdiction-wide REDD strategy, like the establishment of conservation areas, or projects that pay farmers to change their land use practice. Therefore, the types of negative outcomes documented in these studies are relevant to California's proposed jurisdiction-scale REDD program.

Mandated social and environmental safeguards can improve program outcomes but often fail to avoid harm and achieve the listed requirements (prior and informed consent, etc.). This is due to the subjectivity involved in carrying out the policies and evaluating a project against the standards. The priorities and motivations of those carrying out the policies and evaluations have a larger influence on project outcomes than externally imposed standards. For example, the quality and outcomes of public consultations and prior and informed consent requirements have varied widely. It is easy to check the "public consultation" box by holding a publicly announced meeting, without effectively informing communities of what a project means to them, creating a meaningful discussion that airs and resolves differences, and incorporating stakeholder decisions into project decisions (World Bank 2000, Chambers). Poor-quality consultation is commonplace (e.g. McElwee 2016). The evaluation of social and environmental impacts, too, is often subjective, and it has been common for benefits to be exaggerated, and risks to be ignored in impact reports. This can partially be explained by the conflict of interest verifiers hired directly by project implementers have to provide a positive assessment to be hired again. Putting in place social and environmental safeguards is better than not doing so. Such safeguards give communities impacted by projects standards against which to protest projects. Though many safeguard standards have been insufficient to ensure that the standards are actually met.

LEAKAGE

ARB's two proposals for accounting for and avoiding leakage are mathematically logical and simple, but do not address the complexity of the factors determining the effects of deforestation-driving commodities on deforestation and the uncertainty in that effect. For example, ARB's methods of addressing leakage assume that intensification of production of deforestation-driving activities reduces leakage. Such intensification can reduce leakage, but has also led to increased leakage in some cases. In Brazil, intensification of soy production has increased leakage because soy producers have invested their greater profits in more soy production (Oliveira & Hecht 2016). This was made possible because soy consumption is relatively elastic.

REDD CREDITS DON'T MEET THE ADDITIONALITY REQUIREMENT IN AN OFFSETS SENSE

AB 32 defines additionality of an offset credit thus: "the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur." Offsets allow an emitter covered under an emissions cap to reduce emissions outside of the cap in lieu of reductions under the cap. The emitter must cause emissions to be reduced outside of the cap through the credit purchase for the resulting credits to "offset" emissions that otherwise would have been reduced under the cap.

A REDD program linkage is unlikely to meet the additionality requirement in the offsets sense of additionality because it would be very difficult to show that California's REDD program causes reductions in deforestation in the linked jurisdiction. First, too many factors affect deforestation rates. For example, in Brazil, reductions have been affected by the soy and beef moratoriums catalyzed by international NGOs, national Brazil policy, state-level policy and programs, and changes in global commodity prices (Nepstad et al. 2014). It is difficult to assess the extent to which deforestation rates were affected by any one of these factors. Second, the Brazilian government and Acre have decided to make forest protection a priority for a range of reasons, not just for the global climate benefits. Brazil has also committed to reducing its deforestation rate as a part of its commitments under the UN Paris climate accords (in their INDC). They are also receiving funds from governments internationally to help pay for these efforts, including from Norway as mentioned above. An effective REDD program is hard to carry out and requires substantial political will to be successful. The sale of REDD credits can help pay for, and provide legitimacy for, a government to carry out a program they wish to carry out. But if those payments are the main motivation for a REDD program, that REDD program is bound to fail; the political will would not likely be sufficient for an effective REDD program that preserves forests for the long run rather than just lowering emissions for a short period of time. For all of these reasons, REDD credits would not be considered additional as offset credits. Income from REDD credit sales would support state efforts, but the causal link between California's REDD program and the reductions achieved cannot confidently be made.

⁵ Cal. Health & Safety Code § 38562(d)(1)-(2)

EQUIVALENCE IN A LINKAGE SENSE

ARB's choice to link with Acre puts its REDD program in a linkage space rather than an offsets space. This is necessary because the program would not pass the additionality requirements for offsets credits, as described just above. There has never been a linkage between an industrialized and a developing jurisdiction (an Annex 1 jurisdiction and a non-Annex 1 in UNFCCC parlance). So California is forging ahead into new territory.

For evaluating *equivalence*, it helps to note some important characteristics of a linkage between economy-wide cap-and-trade programs like California's and Quebec's:

- California and Quebec both have legally binding caps; both jurisdictions are buying and selling credits, not just selling credits.
- Both targets are ambitious; net credit sales from one jurisdiction to the other will only occur if the ambitious reduction target is achieved and exceeded. Trading is viewed primarily as a way to facilitate joint achievement of the targets, rather than as a source of revenues for reductions below the target.
- Fundamentally, emissions reductions from any one jurisdiction do little to mitigate global climate change; jurisdictions adopt emissions targets to encourage other jurisdictions to accept comparable commitments.
- 4. California's and Quebec's targets and policies to meet those targets are expected to be permanent reductions in a progression towards the long-term deep reductions needed to keep global temperatures below a two degree increase. If either jurisdiction abandons their efforts and lets emissions rise again it would break from the fundamental purpose of the agreement long-term cooperative action towards the deep reductions needed to avoid a temperature increase above two degrees Celsius.

One important difference between the California-Quebec linkage and this proposed REDD linkage is that the REDD linkage is between two jurisdictions with substantially different levels of wealth and responsibility for causing climate change, (with "common but differentiated responsibilities and respective capabilities" in UNFCCC parlance). Distinctions between who should reduce and who should pay for those reductions have been a central point in discussions about equitable global climate change cooperation. 6 Common but differentiated responsibilities justify financial flows only in one direction (that California's cap is legally binding and Brazil is not). It also justifies that Acre should receive international support for some of the "own effort" part of its REDD program.

It is well accepted that Annex 1 jurisdictions have an obligation to both reduce their emissions AND support reductions in non-Annex 1 jurisdictions. A credit-generating REDD program creates a way for those two obligations to be traded-off for one another. Like with emissions trading, trading of two different obligations might make sense if sufficient targets are set for both. But under California's REDD program, California has only established a target for reducing its emissions, and not for providing REDD support.

If California cannot claim responsibility for causing Acre's reductions below the crediting baseline, what then justifies California avoiding reducing its emissions because Acre has reduced its deforestation rates below the baseline? In the linkage world, as discussed above, two jurisdictions

⁶ See the Greenhouse Gas Development Rights as one carefully thought through analysis of how obligations can be equitably distributed, http://gdrights.org/, accessed May 19, 2016

take on targets, and decide to work together to lower the costs of meeting those targets for both parties, on a path towards deep long term reductions.

I don't aim to provide a complete answer as to what equivalence means between an Annex 1 and non-Annex 1 jurisdiction. California is wading into territory that has not yet been agreed under international climate change negotiations. But I do highlight several things that are clear. ARB in assessing the equivalence of a jurisdictional REDD program should only link to a REDD program if the following is true:

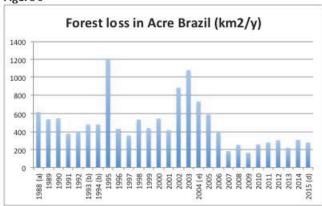
The REDD crediting baseline must be clearly below BAU and require substantial own effort to be achieved. With a linkage between Annex 1 and non-Annex 1 jurisdictions the non-Annex 1 jurisdiction would intend to reduce forest loss below the crediting baseline so that credits are generated, but the crediting baseline should be clearly and conservatively below BAU requiring own effort to be achieved. The efforts taken to reduce deforestation rates must move towards lasting changes that protect forests in the long run. They must address the main drivers of deforestation and not just the low hanging fruit that can slow deforestation temporarily. The jurisdiction must have demonstrated the capacity and motivation to reduce deforestation rates through the success of its existing REDD program. These should be criteria of the equivalence determination. Additionality in the offsets sense of the term (the purchaser reduces someone else's emissions instead of their own) is not confidently achieved with a jurisdictional REDD program. Equivalence in a linkage sense comes from the cooperative agreement to transform the economy towards ever deeper reductions in the sectors covered.

ACRE'S CREDITING BASELINE

Acre has proposed a crediting baseline of 496 km² of forest loss per year, the ten-year average deforestation rate during 2001-2010 (see Figure 3). This rate does not seem to be low enough to confidently avoid non-additional crediting. During the 28-year period from 1988 to 2015, major deforestation spikes occurred in four years—1995, 2002, 2003, and 2004. The 2001-2010 period proposed for the crediting period includes three of those four spike years. The proposed crediting baseline rate is higher than the average deforestation rates during 1988-2001 when the large spike in 1995 is excluded and six percent below that average including the large spike (see Figure 3). Future rates should be lower than past rates due to the influence of the Greenpeace led soy and beef moratoriums and lasting effects of federal policies already implemented. This implies that there is a reasonable chance that future BAU deforestation rates will be below 496 km²/y. Further, Norway has agreed to provide funds to Acre, Brazil, through 2021 as payment for reductions in deforestation rates achieve (results-based payments). Norway's funds should help pay for some of Acre's "own effort" to reduce deforestation and should not be double counted with California's payments.

Birdsall, N., W. Savedoff & F. Seymour. 2014. The Brazil-Norway Agreement with Performance-Based Payments for Forest Conservation: Successes, Challenges, and Lessons. CGD Climate and Forest Paper Series #4





Source: Brazilian PRODES data http://www.obt.inpe.br/prodes/index.php

CAPACITY AND RISK

The risks associated with a credit-based REDD program are large. They include causing harm to forest communities, crediting business-as-usual reductions in deforestation rates, crediting incremental changes in deforestation rates that only postpone deforestation rather than attack the drivers of deforestation in the long run, leakage, double counting with other sources of funding, and creating a weak precedent for international cooperation under the Paris Agreement by allowing two obligations to be traded off of one another – reducing emissions and supporting emissions reductions in poorer countries. I question whether ARB has the capacity to do the due diligence and build the relationships over time to run a jurisdiction-wide REDD program that avoids these risks, and whether it is worth making the success of California's global warming law dependent on ARB's success in doing this.

Supporting an effective REDD program requires understanding the history of forest policy and REDD efforts in the jurisdiction to assess whether there is an interest and capacity in adhering to the social and environmental safeguard principles, and to see if the program indeed addresses the major drivers of deforestation and reflects the changes to the land use sector necessary to slow down and bring an end to deforestation in a sustainable manner. Gaining this understanding involves collecting information from a range of sources including vocal opponents and supporters of REDD, individual researchers from think tanks, academia and NGOs who have done field research in the specific jurisdiction, individuals involved in REDD and forest policy from the state and local governments, local communities, and NGOs and to the individuals they recommend. So far, ARB has not done this, and it is unclear whether the agency has the capacity and ability to do the fieldwork necessary.

Sincerely,

Barbara Haya

11/13

References

- Anthoff, D. & R. S. J. Tol. 2010. On international equity weights and national decision making on climate change. *Journal of Environmental Economics and Management*, 60(1), 14-20.
- ---. 2013. The uncertainty about the social cost of carbon: A decomposition analysis using fund. Climatic Change, 117(3), 515-530.
- Asiyanbi, A. 2015. Mind the gap: global truths, local complexities in emergent green initiatives. In The International Handbook of Political Ecology, ed. R. L. Bryant. EE Elgar.
- Beymer-Farris, B. A. & T. J. Bassett. 2012. The REDD menace: Resurgent protectionism in Tanzania's mangrove forests. *Global Environmental Change*, 22(2), 332-341.
- Birdsall, N., W. Savedoff & F. Seymour. 2014. The Brazil-Norway Agreement with Performance-Based Payments for Forest Conservation: Successes, Challenges, and Lessons. CGD Climate and Forest Paper Series #4
- Borenstein, S., J. Bushnell, F. A. Wolak & M. Zaragoza-Watkins. 2014. Report of the Market Simulation Group on Competitive Supply/Demand Balance in the California Allowance Market and the Potential for Market Manipulation.
- Corson, C. 2011. Territorialization, enclosure and neoliberalism: non-state influence in struggles over Madagascar's forests. The Journal of Peasant Studies, 38(4), 703-726.
- Faustino, C. & F. Furtado. 2014. The Green Economy, Forest Peoples and Territories: Rights Violations in the State of Acre. Fact-finding and advocacy ission preliminary report. . http://www.foe.org/system/storage/877/2b/d/4991/Green Economy Forest Peoples and Territories Acre report.pdf.
- Haya, B. 2009. Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism. Energy and Resources Group Working Paper, ERG09-001. University of California, Berkeley
- He, G. & R. K. Morse. 2010. Making Carbon Offsets Work in the Developing World: Lessons from the Chinese Wind Controversy. Palo Alto. Program on Energy and Sustainable Development, Stanford University
- Ingalls, M. L. & M. B. Dwyer. 2016. Missing the forest for the trees? Navigating the trade-offs between mitigation and adaptation under REDD. Climatic Change, 136(2), 353-366.
- Kelly, A. B. & N. L. Peluso. 2015. Frontiers of Commodification: State Lands and Their Formalization. Society & Natural Resources: An International Journal, 28(5), 473-495.
- Kelly, E. C. & M. B. Schmitz. 2016. Forest offsets and the California compliance market: Bringing an abstract ecosystem good to market. *Geoforum*, 75, 99-109.
- Larson, A. & J. Ribot. 2007. The Poverty of Forestry Policy: Double Standards on an Uneven Playing Field. Sustainability Science, 2(2), 189-204.
- McCollum, D., C. Yang, S. Yeh & J. Ogden. 2012. Deep greenhouse gas reduction scenarios for California Strategic implications from the CA-TIMES energy-economic systems model. *Energy Strategy Reviews*, 1(1), 19-32.
- McElwee, P. 2016. CHAPTER 11: Doing REDD+ Work in Vietnam: Will the New Carbon Focus Bring Equity to Forest Management? In The Carbon Fix, eds. S. Paladino & S. Fiske. Left Coast Press.
- Nepstad, D., D. McGrath, C. Stickler, A. Alencar, A. Azevedo, B. Swette, T. Bezerra, M. DiGiano, J. Shimada, R. Seroa da Motta, E. Armijo, L. Castello, P. Brando, M. C. Hansen, M. McGrath-Horn, O. Carvalho & L. Hess. 2014. Slowing Amazon deforestation through public policy and interventions in beef and soy supply chains. Science, 344(6188), 1118-1123.
- Oliveira, G. & S. Hecht. 2016. Sacred groves, sacrifice zones and soy production: globalization, intensification and neo-nature in South America. The Journal of Peasant Studies 43(2).

- Osborne, T., L. Bellante & N. v. Hedemann. 2014. Indigenous Peoples and REDD+: A Critical Perspective. report of the Public Political Ecology Lab, University of Arizona
- Pokorny, B., I. Scholz & W. de Jong. 2013. REDD+ for the poor or the poor for REDD+? About the limitations of environmental policies in the Amazon and the potential of achieving environmental goals through pro-poor policies. *Ecology and Society*, 18(2).
- Regional Economic Models Inc. (REMI). 2014. Environmental Tax Reform in California: Economic and Climate Impact of a Carbon Tax Swap. Washington, DC
- US Environmental Protection Agency. 2013 (revised 2015). Technical Support Document:

 -Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis -Under Executive Order 12866. Washington, DC
- Wara, M. 2008. Measuring the Clean Development Mechanism's Performance and Potential. UCLA Law Review, 1759-1803.









April 10, 2017

Letter 202

The Honorable Mary Nichols Chair, California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: 2030 SCOPING PLAN UPDATE

Dear Chair Nichols and Board Members:

We would first like to thank the Air Resources Board for the opportunity to provide comments on the 2030 Scoping Plan Update. The undersigned organizations work directly with and support disadvantaged communities throughout the San Joaquin and East Coachella Valleys. We believe that in order for California to reach its climate goals and for communities to experience real benefits and improvements, we must consider and plan for the distinct challenges environmental justice communities are faced with. We provide the following comments to help strengthen the Scoping Plan document and ensure that these communities are a critical part of the strategy to achieve significant greenhouse gas reductions.

We believe ARB can better balance the concerns of environmental justice communities with the state's climate goals in three ways: (1) amending the current system to directly reduce emissions in disadvantaged communities, (2) ensuring equity through improved transit operations and land use planning, and (3) more closely coordinating with other state agencies to implement climate adaptation and mitigation programs.

A. Amending the Current System

Carbon offsets provide industry with compliance flexibility, but result in outsourced benefits and negative impacts on California's disadvantaged communities. According to a recent study, the Cap and Trade program has allowed in-state emissions to rise, with California's largest greenhouse gas (GHG) emitters reporting increases in their localized emissions since 2011¹. The report also found these high-emitting facilities more likely to use out-of-state offset projects to meet their emission reduction

202-1

http://dornsife.usc.edu/assets/sites/242/docs/Climate Equity Brief CA Cap and Trade Sept2016 FINA L2.pdf

¹ Lara J. Cushing, et al., A Preliminary Environmental Equity Assessment of California's Cap and Trade Program. 2016.

obligations - rather than directly reducing emissions. Because regulated GHG-emitting facilities, especially the highest-emitting sources, are more often located in neighborhoods with higher proportions of residents of color and residents living in poverty, the cap-and-trade program has allowed for increased harm to disadvantaged communities while outsourcing California's potential climate and health benefits.

202-1 cont.

For example, carbon dioxide (C02) emissions from the oil and gas producer Berry Petroleum operating in Kern county have consistently risen since 2011². The criteria pollutants PM2.5 and oxides of nitrate (NOx) have risen alongside CO2, increasing smog and particulate matter formation in nearby communities and in the entire air basin. For PM2.5, the San Joaquin Air basin is the most polluted region in the nation, with Bakersfield in Kern county ranked as the most polluted city in the country. Kern County and areas like it are exactly the communities that cannot endure further increases in pollution and should benefit, not lose, from California's climate programs.

The current system does little to protect the wellbeing of environmental justice communities, but rather furthers their vulnerability to climate change and threatens public health. Equity co-benefits of the program could be enhanced if direct emission reductions are prioritized and facilities are required to reduce on-site emissions instead of relying on the overuse of offsets.

B. Equitable Transportation and Land Use Planning

The Scoping Plan identifies electrification of vehicles as a critical strategy to achieving our climate goals. Currently, this widespread use of zero-emission vehicles (ZEVs) is more common in metropolitan, urban cities such as Sacramento, Los Angeles, and the San Francisco Bay Area. Electric vehicles have not infiltrated the San Joaquin Valley due largely in part to a) the lack of effective outreach to disadvantaged communities and rural communities about available funding opportunities and b) lack of investment in ZEV charging infrastructure. To promote widespread ownership of ZEVs in disadvantaged, low-income communities, much more must be done in terms of outreach to existing programs and opportunities such as ARB's Scrap and Replace and the Clean Vehicle Rebate Program (CVRP). New vehicles are highly unaffordable for most low-income families, and while programs such as CVRP exist to ease the cost burden of this investment, most residents are not aware of them. ARB must work with partner agencies and stakeholders to ensure that outreach is targeted to disadvantaged communities, and rural communities specifically, who could benefit from the greenhouse gas reductions that result from large-scale electrification of vehicles. Additionally, investment must be directed to these communities to fund infrastructure to support the demand for ZEVs, as currently the scarcity of charging stations deters buyers from purchasing electric cars.

Many communities in the San Joaquin Valley and the Eastern Coachella Valley, both rural and urban, are severely lacking in active transportation infrastructure. This includes, bike lanes, sidewalks, street lights, walk paths and trails. According to CARB's 2014 Greenhouse Gas Inventory, transportation

² California Air Resources Board, Integrated Emissions Visualization Tool. https://justtransit.org/wp-content/uploads/2017/03/Just-Transit-Release Final.pdf

contributes nearly 37% to California's total greenhouse gas emissions³, so robust investment in active transportation is critical to reducing emissions from this sector and creating meaningful transportation options for disadvantaged communities.

Land use planning in the San Joaquin Valley is largely centered on large, sprawling new developments in the outskirts of cities and counties rather than infill development in existing communities and highway expansion rather than local road improvements. In the Scoping Plan Draft, ARB identifies sprawl and highway expansion as an issue for regional and local governments to take action on collaboratively. The currently on-going SB 375 target update process is an opportunity for ARB to address this and urge MPOs to align their projects with state goals to reduce VMTs. We recommend that the role of SB 375 and regional targets and planning be more thoroughly considered in the Scoping Plan as a strategy to achieve California's climate goals. We would like to emphasize EJAC's recommendation to ARB that building new highways and expanding existing ones must not constitute as a greenhouse gas reduction strategy.

Many communities, such as the unincorporated rural community of Lanare in Fresno County, lack basic services like health clinics and grocery stores. Because of a lack of reliable, affordable public transit, residents are forced to drive their vehicle to access these services, thus increasing Vehicle Miles Traveled (VMTs). We suggest that reduced or waived transit passes for students, elderly, and youth be included as a strategy in the Scoping Plan as well as commitments from ARB to improve transit resources to expand routes, provide bus stops with shelters and lights, and increase frequency of buses.

Additionally, ARB must carefully consider the benefits of alternative modes of public transit, such as vanpool programs, to serve the needs of rural communities. For example, the community of Cantua Creek was recently awarded a grant to fund a community-lead vanpool project called *Van Y Vienen* that would provide zero emission vans to connect residents to nearby cities⁴. We recommend that ARB include community-driven programs such as this and use successful project examples as models to include in the Scoping Plan, as well how these projects could be successful in rural and urban areas.

We also believe that the transportation funding bill, SB 1, must align with state climate goals and incorporate equitable investment. This means that priority must be given to projects that will reduce emissions from transportation, including passenger vehicles through VMTs and emissions from the freight sector. Funds must be directed to active transportation, public transit, and road improvements in disadvantaged communities.

C. Inter-Agency Collaboration

The Scoping Plan currently makes virtually no reference to California Natural Resources Agency's Safeguarding California Plan, which outlines the state's strategy for building climate

³ California Air Resources Board, California Greenhouse Gas Emission Inventory. 2014 Total CA Emissions, Emissions by Economic Sector. https://www.arb.ca.gov/cc/inventory/data/data.htm
⁴ Just Transit, Just Transit Challenge Winners Announced. 2017. https://justtransit.org/wp-content/uploads/2017/03/Just-Transit-Release Final.pdf

adaptation. As stated in the 2009 Safeguarding California Plan, "many climate mitigation strategies, like promoting water and energy efficiency, are also climate adaptation strategies." The 2009 Plan also states that the adaptation strategy was built using the Scoping Plan and climate science as a framework, and therefore "closer coordination is needed" to implement the state's climate adaptation and mitigation strategies. We believe that the Scoping Plan's failure to integrate Safeguarding California demonstrates this lack of coordination and urge ARB to work more closely with the Natural Resources Agency, and other agencies, to foster more collaborative inter-agency relationships in the Scoping Plan.

SB 5 (De Leon) and AB 18 (Garcia), if passed, will provide bonds for climate adaptation programs to protect parks and water. To the extent that this legislation moves forward, the Scoping Plan must include these programs in a climate adaptation component.

Additionally, there are many climate mitigation and adaptation programs, within and outside of the Greenhouse Gas Reduction Fund. We suggest a streamlined "one-stop shop" for disadvantaged communities that brings together all funding and loan programs and assistance across all sectors. This ensures that environmental justice communities can be competitive when it comes to accessing funding for climate programs.

* *

Sincerely,

Nikita Daryanani Leadership Counsel for Justice and Accountability

Kevin Hamilton, RRT Central California Asthma Collaborative Medical Advocates for Healthy Air

Nayamin Martinez, MPH Central California Environmental Justice Network

⁵ California Natural Resources Agency, 2009 California Adaptation Strategy. http://resources.ca.gov/docs/climate/Statewide Adaptation Strategy.pdf

Letter 203





















Chair Mary Nichols and Members of the Air Resources Board California Air Resources Board 1001 I Street Sacramento, CA 95814

April 10th, 2017

Dear Chair Mary Nichols and Members of the Air Resources Board,

First, we want share our appreciation for your leadership and commitment to ensuring our state has a strong, coordinated plan in place to achieve our 2030 climate goals. The 2030 Scoping Plan will shape our state's future actions, and it is important that it provides a clear roadmap for all sectors to reduce greenhouse gas emissions and provide real benefits to all Californians.

Our coalition would like to make sure that the 2030 Scoping Plan includes a clear strategy to reduce greenhouse gas (GHG) emissions and vehicle miles traveled (VMT) from all sectors including the transportation sector.

As new data released this month from the UC Davis Institute of Transportation Studies and the National Center for Sustainable Transportation affirms, reducing vehicle miles traveled can result in a multitude of co-benefits, including increased physical activity, reduced costs, and improved air quality.¹

Below we offer our recommendations to strengthen the draft 2030 Scoping Plan's efforts to reduce GHG emissions.

¹ National Center for Sustainable Transportation. (2017). Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled. https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-White-Paper-VMT-CoBenefits-White-Paper-LP_EB_LI.PDF.pdf

- Pursue ambitious SB 375 targets that align with SB 32, maximize co-benefits, and benefit disadvantaged communities
- 2. Elevate reductions from VMT in the 2030 Scoping Plan by including:
 - a. Establish a 7.5 percent reduction as the target for VMT, and
 - b. Key statewide and regional strategies to reduce vehicle dependence.
- Encourage stronger coordination with the Legislature and state agencies including Caltrans, California State Transportation Agency (CalSTA), and the California Transportation Commission (CTC) to ensure all transportation and planning efforts achieve our 2030 climate goal.
- Evaluate the health impacts of Scoping Plan measures and scenarios in both the plan document and Environmental Impact Report (EIR).
- 5. Support implementation of SB 743.
- Advance recommendations put forth by the Environmental Justice Advisory Committee (EJAC) as related to reducing VMT.
- 7. Include a clear and quantifiable climate goal for natural and working lands.
- Set local percentage reduction goals commensurate with state targets; remove per capita goals.

Below we describe these recommendations in more detail.

1. Pursue ambitious SB 375 targets that align with SB 32, maximize co-benefits, and benefit disadvantaged communities.

While the state has set out ambitious goals for reducing greenhouse gas emissions, the 2030 emission reduction mandate is not well aligned with regional GHG reduction efforts under SB 375. The Scoping Plan must provide greater guidance and direction to support more ambitious targets. We recommend that the 2030 Scoping Plan include explicit language calling for higher SB 375 targets for MPOs. This language should emphasize that more ambitious SB 375 targets will help the state achieve its 2030 emission reduction mandate, as well as maximize co-benefits such as increased physical activity, improved air quality, reduced transportation costs, and preservation of natural and working lands. Finally, the language should recommend that the SB 375 targets also provide direct benefit to low-income / disadvantaged communities.

Without explicit direction in the 2030 Scoping Plan, we remain concerned that some regions may not seek out more ambitious land use and transportation strategies to transform their regions into more walkable, bikeable, transit-friendly communities that achieve significant greenhouse emission reductions. In addition, a failure to pursue higher regional SB 375 targets could conflict with and hinder achievement of strong climate action plans that many individual cities have

² ARB Workshop Presentation. March 9, 2017. https://arb.ca.gov/cc/sb375/sb 375 march workshop presentation sacramento.pdf

adopted or are considering adopting. ARB's own research suggests that we will need more ambitious SB 375 targets to achieve our state climate goals.

2. Elevate reductions from VMT in 2030 Scoping Plan by including both of the following:

A. Establish a 7.5 percent reduction as the target for VMT.

In ARB's March 2017 workshops, the Scoping Plan Scenario showed that additional VMT reductions above adopted SCS achievements are needed to meet our 2030 emission reduction mandate. ARB's own research shows that the state needs to reduce VMT by 7.5 percent by 2030 to achieve the emission reduction mandate. Numeric targets are incredibly helpful to track progress as well as ensure the state and regions achieve their goals. We recommend that the 2030 Scoping Plan include the 7.5 percent reduction from VMT as a numeric target to advance our first recommendation as well as provide a clear target for both the state and regions to meet.

B. Include key statewide and regional strategies to reduce vehicle dependence.

Since the draft Scoping Plan was released, a white paper prepared for the Strategic

Growth Council entitled "A Framework for Projecting the Potential Statewide VMT

Reduction from State-Level Strategies in California" has outlined key state-level

strategies to reduce VMT. Last year, ClimatePlan also released a report entitled,

"Leading the Way: Policies and Practices for Sustainable Communities Strategies." This
report highlights key land use and transportation strategies that reduce VMT and
maximize co-benefits.

If ARB finds that regional targets cannot rise to the level necessary to reach the state's climate goals, we recommend the 2030 Scoping Plan identify specific, realistic state strategies that can close this gap. These strategies should be as specific as possible, quantifying the climate benefits of particular strategies wherever possible and identifying the responsible state agencies who can take the lead on their implementation. We recommend the 2030 Scoping Plan include (but not limited itself to) the following strategies:

Promote transit oriented development that serves the needs of residents across the income spectrum: California needs stronger approaches to guide growth near transit and ensure that this growth serves the needs of low-income residents. In particular, the production and preservation of affordable housing and anti-displacement strategies in areas near transit can help ensure that low-income residents have access to transit. Focusing on strengthening the jobs-housing fit is

³ National Center for Sustainable Transportation. (2017). A Framework for Projecting Statewide Vehicle Miles Traveled (VMT) Reduction from State-Level Strategies in California. https://ncst.ucdavis.edu/wp-content/uploads/2017/03/State-Level-VMT-Strategies-White-Paper_LP_EB1.pdf

⁴ ClimatePlan. (2016). Leading the Way: Policies and Practices for Sustainable Communities Strategies. http://www.climateplan.org/wp-content/uploads/2016/10/Leading-the-Way-Full-Report.pdf

- another strategy to reduce VMT versus emphasizing a distributed mix of uses of land within a given geography.
- Guide investment to rural communities' land use and transportation policies:
 The 2030 Scoping Plan should recommend that rural communities shift their investments away from sprawl-oriented development and focus on strategies such as infill development in existing communities.
- Include performance metrics for transportation investments: Ensure that
 capital expenditures are in alignment with SB 375 targets by evaluating them
 according to their potential to contribute to VMT reductions. Projects that don't
 fit with the current-day planning paradigm should not receive public funding.
- Develop clear strategies to meet active transportation goals. We strongly support the draft plan's ambitious goals for active transportation. However, the draft plan does not include feasible strategies to achieve these goals and does not reflect the goals from other state plans such as the Caltrans Strategic Management Plan and new Statewide Pedestrian and Bicycle Plan. We recommend the 2030 Scoping Plan include stronger policy commitments with clear implementation actions for active transportation as well as greater coordination with other agencies such as Caltrans.

3. Encourage stronger coordination with the Legislature and state agencies including Caltrans, California State Transportation Agency (CalSTA), and the California Transportation Commission (CTC) to ensure all transportation and planning efforts achieve our 2030 climate goal.

Last week, the Legislature approved a ten-year \$5 billion/year (\$52 billion total) transportation funding package. To ensure expenditures from this package are aligned with state climate goals as stated by ARB board members last month and achieve our 2030 climate goals, we will need all state agencies to work together to ensure our transportation investments and planning efforts align with our climate target reductions. We recommend the 2030 Scoping Plan assign the agencies listed above with responsibility for key statewide VMT reduction strategies (as related to the agency's mission) and include a clear implementation timeline so these efforts are completed in a timeframe to meet the 2030 target. We also recommend that the 2030 Scoping Plan include language that encourages the state agencies listed above to regularly meet to discuss their efforts to reduce VMT and any funding packages / investments that may impact our climate goals.

4. Evaluate the health impacts of Scoping Plan measures and scenarios in both the plan document, and Environmental Impact Report (EIR).

We support the comments submitted by the Public Health Alliance of Southern California, the Public Health Institute and the American Lung Association in California calling for a greater analysis of the health impacts of the Scoping Plan. We are pleased that ARB included high-level

203-1

health and equity discussions in the 2030 Scoping Plan, and provided a general overview of the connections between health and the Scoping Plan. However, we remain concerned that this overview does not currently analyze the specific health impacts of the differing strategies and scenarios. We note that it is also missing an analysis on the relative contributions of both health benefits and impacts as they affect population sub-groups.

We recommend that ARB fund an independent consultant with experience in the comprehensive analysis of health impacts to conduct a health equity assessment of the strategies and alternatives in the Scoping Plan. This study should assess the expected magnitude and distribution of health costs and benefits for each strategy. It should also include projected changes to physical and mental health resulting from the strategies proposed in the Scoping Plan, including land use and transportation patterns, green infrastructure, energy efficiency, building design, and air quality. This analysis must assess the distributional impacts and benefits of strategies and scenarios in different sub-groups of California's population. This stronger health analysis is needed to fulfill AB 197 and CEQA requirements.

203-1 cont

5. Support implementation of SB 743.

The draft 2030 Scoping Plan and Appendix C mention Senate Bill 743 (Steinberg) several times. This law establishes VMT, rather than Level of Service (LOS), as the principal transportation metric for determining environmental impacts under CEQA, and will be a useful tool to help us achieve our 2030 climate goal. However, the state's SB 743 guidelines have been held up for over a year, resulting in many lost opportunities to improve land use and transportation decisionmaking in furtherance of our state climate goals. We recommend that ARB work with OPR to advance and accelerate the implementation of SB 743. We also recommend that the Scoping Plan explicitly call out SB 743 as a critical strategy to help us meet our climate goals.

6. Advance recommendations put forth by the Environmental Justice Advisory Committee (EJAC) as related to reducing VMT.

We are very supportive of the recommendations provided by the EJAC in relation to reducing VMT and advancing sustainable, equitable communities. We recommend that ARB continue to work with the EJAC to incorporate these recommendations into the Scoping Plan, especially those related to community engagement, transportation investments in disadvantaged communities, natural resources and public health impacts.

7. Include a clear and quantifiable climate goal for natural and working lands.

We recommend that CARB include a GHG reduction goal for natural and working lands to achieve at least 5 million metric tons of reductions in carbon dioxide equivalent (MMTCO2e) annually by 2030. Based on a preliminary analysis⁵, this would be a relatively conservative goal

⁵ The Nature Conservancy of California. Internal Analysis of GHG Reduction Potential for Natural and Working Lands. 2017

for this sector. This goal could be achieved through activities such as managing forests to increase carbon stocks, urban forestry, reforestation, wetland restoration, avoided conversion, and a variety of rangeland and agricultural land management activities, among others.

8. Set local percentage reduction goals commensurate with state targets; remove per capita goals.

In line with Climate Action Campaign's comments on the 2030 Scoping Plan, we recommend ARB to remove the per capita reduction targets from the draft 2030 Scoping Plan and replace them with goals that are consistent with our statewide emission reduction mandate.

In closing, thank you for your leadership on this issue, and your consideration of our recommendations. We look forward to continued work with you to ensure a sustainable and healthy future for our state.

Sincerely,

Nikita Daryanani, Policy Advocate Leadership Counsel for Justice and Accountability

Nicole Capretz, Executive Director Climate Action Campaign

Joshua Stark, Policy Director TransForm

Bonnie Holmes-Gen, Senior Policy Director, Air Quality and Climate Change American Lung Association in California

Michelle Passero, Senior Climate Policy Advisor The Nature Conservancy

Bill Sadler, Senior California Policy Manager Safe Routes to School National Partnership

Chuck Mills, Director of Public Policy and Grants California ReLeaf

Reverend Earl W. Koteen, Member, Coordinating Committee Sunflower Alliance Bryn Lindblad, Associate Director Climate Resolve

Linda Rudolph, Director Center for Climate Change and Health

Chanell Fletcher, Associate Director ClimatePlan

Matt Baker, Land Use and Conservation Policy Director Environmental Council of Sacramento























April 10, 2017

Via Electronic Filing on ARB Website

Richard Corey, Executive Officer California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: Comments on the 2017 Climate Change Scoping Plan Update

Dear Mr. Corey:

On behalf of the undersigned environmental justice, public health, and allied organizations, we submit these comments on the Proposed 2017 Climate Change Scoping Plan Update ("Proposed Plan"). The organizations, individuals, and groups listed below work directly with low-income residents and residents of color who are disproportionately impacted by industrial pollution, toxic air emissions, and climate change. Climate change solutions must protect all Californians, starting with those already overburdened by air pollution and climate change.

The Proposed Plan offers a five-scenario roadmap for achieving the 2030 target established by Senate Bill 32: (1) existing measures, a twenty percent reduction at refineries ("Refinery Rule"), and

¹The twenty or thirty percent reduction in refinery emissions in the three scenarios targeted by the Board are in all cases less than the required 40 percent target for 2030, disparately leaving refinery

Cap and Trade; (2) existing measures, a refinery rule with at thirty percent reduction, no Cap and Trade, and additional direct reduction measures; (3) existing measures, the Refinery Rule, and a carbon tax; (4) existing measures, no Refinery Rule, and more reliance on Cap and Trade; and (5) existing measures, the Refinery Rule, and a cap and tax. See Discussion Draft at 32-36, 49-53.

The Proposed Scoping Plan suffers from four major deficiencies and should be revised. First, the Plan identifies Cap and Trade, existing measures, and the Refinery Rule as the Proposed Scoping Plan Scenario. Cap and Trade harms communities of color and low-income communities, with in-state emissions going up in several sectors, while out-of-state emissions reductions through divestment (resource shuffling) and out-of-state offsets provide the primary emissions reductions attributed to the program. Cap and Trade inflicts a racially disparate adverse impact on communities of color by allowing pollution trading and excessive offsets usage, which both condone pollution increases and deny the benefits of pollution reductions. Approval of a Plan that includes Cap and Trade would thus violate Government Code section 11135. Furthermore, the Board does not have the legal authority to implement Cap and Trade beyond 2020, and should thus revise the Scoping Plan accordingly.

Second, the Proposed Plan violates Assembly Bill 197, which directs the Board to prioritize direct emissions reductions when adopting rules and regulations to meet the 2030 target. The Plan only offers a twenty percent reduction at refineries as a potential direct reduction measures, and does not prioritize direct reductions at other stationary and mobile sources. The Board *shall* prioritize direct emissions reduction strategies for <u>all</u> the sources identified by Assembly Bill 197.

Third, the Proposed Plan inadequately analyzes the carbon tax alternative which, like Cap and Trade, would generate revenue and be subject to a Proposition 26 super-majority vote in the Legislature. The Plan fails to adequately analyze this alternative by constructing straw man carbon tax alternatives which fails to discuss and consider important, unique characteristics of California's current climate laws. The Board should thus revise the Draft to meaningfully consider a cap and tax as an alternative to Cap and Trade.

Fourth, the Environmental Analysis fails to adequately analyze and mitigate the Cap and Trade air quality impacts on public health.

- Cap and Trade is an Inappropriate Strategy and Should not be Part of the Scoping Plan to Meet the 2030 Target.
 - A. Implementation Data Indicate Communities of Color are Adversely and Disproportionately Affected.

In September 2016, leading researchers released a report assessing the inequalities in the location of greenhouse gas-emitting facilities and the amount of greenhouse gases and particulate matter

communities behind. The apparent proposal to measure the Refinery Rule based on a refinery's product output rather than its crude input reduces the transparency of future compliance for these same communities, exhibiting both of the major flaws in the agency's past approach discussed herein.

("PM10") emitted by facilities regulated under Cap and Trade.² The report also provides a preliminary evaluation of changes in localized greenhouse gas emissions from large stationary sources since the advent of the program. The report found:

- On average, neighborhoods with a facility within 2.5 miles have a 22 percent higher proportion
 of residents of color and 21 percent higher proportion of residents living in poverty than
 neighborhoods that are not within 2.5 miles of a facility.
- These communities are home to a higher proportion of residents of color and people living in poverty than communities with no or few facilities nearby. Indeed, the higher the number of proximate facilities, the larger the share of low-income residents and communities of color.
- 3. The neighborhoods within 2.5 miles of the 66 largest greenhouse gas and PM10 emitters have a 16% higher proportion of residents of color and 11% higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility.
- 4. The first compliance period reporting data (2013-2014) show that the cement, in-state electricity generation, oil & gas production or supplier, and hydrogen plant sectors have increased greenhouse gas emissions over the baseline period (2011-2012).
- The amount of emissions "offset" credits exceed the reduction in allowable greenhouse gas
 emissions (the "cap") between 2013 and 2014 and were mostly linked to projects outside of
 California.

The Proposed Plan fails to discuss this report, its supporting data, or its conclusions, despite comments on prior iterations of the Plan raising this specific issue. The report raises significant concerns and discloses new data that should foreclose the Air Board from extending the Cap and Trade program. The report demonstrates three fundamental points that environmental justice advocates have raised for years: (1) Cap and Trade disparately affects communities of color; (2) Cap and Trade denies communities the benefits of on-site reductions; and (3) greenhouse gas reductions attributed to Cap and Trade occur primarily outside of California.³ It concludes:

Preliminary analysis of the equity and emissions impacts of California's cap-and-trade program indicates that regulated GHG emission facilities tend to be located in neighborhoods with higher proportions of residents of color and those living in poverty. There is a correlation between GHG emissions and particulate matter levels, suggesting a disparate pattern of localized emissions by race/ethnicity and poverty rate. In addition, facilities that emit the highest levels of both GHGs and particulate matter are similarly more likely to be located in communities with higher proportions of residents of color and those living in poverty. This suggests that public health and environmental equity co-benefits could be enhanced if there were more GHG reductions among the larger emitting facilities that are located in disadvantaged communities. Currently, there is little in the design of cap-and-trade to insure this set of localized results. Moreover, while the

² Lara J. Cushing, et al., A Preliminary Environmental Equity Assessment of California's Cap and Trade Program, attached as Exhibit 1.

³ Claimed reductions from imported electricity generation remain suspect given the Board's creation of safe harbor exemptions from the resource shuffling prohibition, which allow greenhouse gas emissions to continue in fact as leakage. *See* Danny Cullenward, BULLETIN OF THE ATOMIC SCIENTISTS, 2014, Vol. 70(5) 35–44, attached as Exhibit 2.

cap-and-trade program has been in effect for a relatively short time period, preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were located outside of California. Large emitters that might be of most public health concern were most likely to use offset projects to meet their obligations under the cap-and-trade program.⁴

The Board has taken no final action to assess or prevent these impacts, and instead has consistently demonstrated its intent to prevent the public from accessing facility-specific compliance data and delayed implementation of its Adaptive Management Plan. The Board has taken the position that the public may not access critical Cap and Trade compliance and trading data, claiming that compliance with Cap and Trade constitutes "confidential business information." When promulgating the Cap and Trade regulations in 2011, the Board claimed that it would assess and prevent adverse impacts through an Adaptive Management Plan. The Initial Statement of Reasons ("ISOR") for the recently proposed Cap and Trade extension admits that the Board has not finalized or implemented the Adaptive Management Plan. IsoR at 302. Collectively, these two issues show how the Board withholds important information from the public regarding sources' compliance and has not prevented Cap and Trade inequities.

More recently, the Office of Environmental Health Hazard Assessment (OEHHA) released a report that analyzed the emissions data from Cap and Trade facilities. It found strong correlations between greenhouse gas emissions and PM2.5 at all facilities, and strong correlations between greenhouse gas emissions and toxics at refineries. The OEHHA Report concluded that "these analyses suggest that reductions in greenhouse gas emissions are likely to result in lower pollutant exposures in disadvantaged communities, based overall on the positive correlations observed for the 2014 data." Because of the correlations identified, when the Air Resources Board decides to allow pollution trading rather than direct reductions, it pursues a policy that denies communities living near Cap and Trade facilities the health benefits from direct reductions.

B. Approval of a Scoping Plan that Includes Cap and Trade will Violate Government Code Section 11135.

The Board has a duty under California civil rights law to ensure that its programs or policies do not inflict racially disparate treatment or result in racially disparate effects. Gov. Code § 11135. The Board will violate section 11135 if it adopts a Scoping Plan which includes Cap and Trade because, as set forth above in section I.A, Cap and Trade results in racially disparate and adverse impacts when it

⁴ Lara J. Cushing, et al., A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP AND TRADE PROGRAM at 7-9, attached as Exhibit 1.

⁵ See, e.g. Email from Edie Chang to Brent Newell, dated August 19, 2015, attached as Exhibit 3. ⁶ Even if the Board had finalized the Adaptive Management Plan, as currently proposed it would not address the section 11135 issues. The Adaptive Management Plan only proposes to take action at the Board's sole discretion when cap and trade causes an emissions increase, and does not resolve the denial of benefits issue or negate the Board's deliberate indifference.

⁷ Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities: Initial Report, attached as Exhibit 4.

denies communities the benefits of direct reductions and allows sources to increase emissions through pollution trading and offsets usage. The Board has the authority to adopt alternatives to Cap and Trade, has actual knowledge of the racially disparate and adverse impacts from the denial of benefits and localized emissions increases, yet does not adequately prevent racial discrimination prohibited by Government Code section 11135.

C. The Board should Remove Cap and Trade from the Draft Scoping Plan because the Board has no Authority to Extend Cap and Trade after 2020.

The Board lacks authority to include Cap and Trade in the Scoping Plan for reductions to achieve the 2030 target. A fundamental principle of administrative law dictates that agencies only have those powers delegated by the Legislature. The Board's authority to implement the Cap and Trade program expires on December 31, 2020 and the Board has no authority to extend the program beyond that date. Health & Safety Code §§ 38562(c), 38570.

ARB staff have claimed that AB 32 authorizes these regulations because of language in Part 3 of AB 32 related to the statewide greenhouse gas limit (the level of emissions in 1990). "It is the intent of the Legislature that the statewide greenhouse gas emissions limit continues in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020." Health & Safety Code § 38551(b). Grasping on to the words "continue reductions," the staff believe they can extend Cap and Trade to 2030 to achieve the reductions required by Senate Bill 32. Section 38551, however, must be understood in the context of the statutory scheme as a whole. The very next subsection of section 38551 directs the Board to make recommendations to the Governor and the Legislature on how to continue reductions, and does not give the Board the authority to take those actions *sua sponte*. "The state board shall make recommendations to the Governor and the Legislature on *how* to continue reductions of greenhouse gas emissions beyond 2020." Health & Safety Code § 38551(c) (emphasis added).

Nor has the Legislature acted to extend the Board's authority. During the 2015 legislative session, the version of Assembly Bill 1288 (Atkins) containing an extension of the Board's authority to implement Cap and Trade beyond December 31, 2020 did not become law. Instead, the Legislature amended Assembly Bill 1288 to add two environmental justice seats to the Board, demonstrating a legislative intent to prioritize environmental justice, not Cap and Trade. During the 2016 legislative session, Senate Bill 32 became law and requires the Board to achieve a 40 percent reduction in greenhouse gas emissions below the statewide greenhouse gas limit (1990 levels) by 2030. Stats. 2016, ch. 249, § 2, p. 88 (codified as Health & Safety Code § 38566). No provision of Senate Bill 32 amended section 38562(c) or otherwise authorized the Board to implement Cap and Trade after the year 2020. Accordingly, the Board lacks the authority to include Cap and Trade as part of the Scoping Plan.

II. The Board Must Prioritize Direct Emissions Reductions at Stationary and Mobile Sources.

Assembly Bill 197 (Garcia) expressly directs the Board to prioritize direct emissions reductions at large stationary sources, mobile sources, and all other sources. The Board has no authority to disregard direct emissions reduction strategies for the purposes of meeting the additional reductions required by Senate Bill 32. Rather, the Board must prioritize "emissions reduction rules and regulations that result in direct emission reductions at large stationary sources of greenhouse gas emissions and

direct emissions reductions from mobile sources." Stats. 2016, ch. 250, § 5, subdivision (a), p. 92 (codified as Health & Safety Code § 38562.5(a)).

Except for the Refinery Rule, which calls for efficiency increases to achieve a twenty percent reduction, the Proposed Plan fails to include any other direct reduction strategies at stationary or mobile sources to comply with Assembly Bill 197. Especially problematic are the Plan's failure to require direct reduction measures for the cement plant, power plant, oil and gas, and glass factory sectors, which all emit substantial greenhouse gas and co-pollutant emissions.

The Plan itself acknowledges that the cost effectiveness of the Refinery Rule is the same or higher than other identified direct reduction measures not included in the Proposed Plan. The cost effectiveness of the refinery rule 30 percent reduction measure, the industry measure, and the oil and gas measure are all the same as the Refinery Rule (\$70 to \$200/metric ton).⁸ Direct measures for mobile sources (Mobile Source Strategy (CFT)) offer potential cost savings at the low end of the range with a high estimate no greater than the Refinery Rule (-\$150 to \$200/metric ton).⁹

The Plan thus violates AB 197 by prioritizing Cap and Trade as a reduction strategy when the plain language of the statute directs the Board to prioritize direct reduction measures. Even if the Board had discretion — which it does not — then the Plan still violates AB 197 because the Plan offers no cogent explanation for the proposal to prioritize direct measures at refineries, but not at other Cap and Trade sources.

III. The Proposed Plan Inadequately Analyzes Carbon Tax Alternatives.

Under CEQA, the Plan must include a description of alternatives to the proposed regulatory program that minimize the significant environmental impacts of the program. Pub. Res. Code § 21080.5(d)(3)(A). This requirement is necessary to further the State's goal of "avoiding significant adverse effects on the environment where feasible," and policy that public agencies shall not approve projects if feasible alternatives would substantially lessen the significant environmental effects of those projects. CEQA Guidelines § 15250; accord Pub. Res. Code § 21002. Lead agencies must examine a reasonable range of alternatives that feasibly meet most of the project's basic objectives while avoiding or substantially reducing the significant effects of the project, even if these alternatives "would impede to some degree the attainment of the project objectives, or would be more costly." CEQA Guidelines § 15126.6(a), (b).

204-2

While the level of detail in an alternatives analysis is not subject to any precise formulation, the examination of alternatives must "include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." CEQA Guidelines § 15126.6(d). Furthermore, "the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project's impact on the environment, the agency's approval of the proposed project followed meaningful consideration of alternatives and mitigation measures." *Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 134. By offering conclusory statements and cursory discussions in place of actual analyses, improperly arguing that analysis is

^{*}See Proposed Plan, Table III-3 at 65.

⁹ Id.

speculative, and deferring analyses of alternative regulatory programs to later rulemaking procedures, ARB failed to undertake any meaningful analysis of the alternatives. This lack of analysis renders it impossible to compare these choices to the preferred alternative, undermining CEQA's goal of "foster[ing] informed decision-making and public participation." CEQA Guidelines § 15126.6(a).

The Proposed Plan sets forth a carbon tax scenario which it then strikes down as failing to meet several criteria. Proposed Plan at 50-52. The Plan first paints a carbon tax as lacking the certainty to meet the 2030 target by not having limits at facilities individually or in the aggregate (the "cap" part of Cap and Trade), and then uses an example from British Columbia. What the Plan fails to consider or disclose are several unique characteristics in California that surround a carbon tax and provide emissions certainty. First, Assembly Bill 197 prioritizes direct emissions reductions beyond the Refinery Rule which the Draft excludes from the scenario. Additional direct reductions that apply and occur before a carbon tax provide certainty while the carbon tax places further downward pressure on emissions.

Second, the Plan ignores the Board's on-going authority to update the Scoping Plan on a five-year interval and its authority to promulgate direct reductions to address any carbon tax-related shortfalls. The Board has the overall duty to ensure that California meets the 2030 target, and the authority to make that happen through direct emissions reductions as provided in Assembly Bill 32 and Senate Bill 32. The Plan does not recognize this authority in the scenario, nor does such authority exist in the misleading British Columbia example. The Board claims a carbon tax has "no mechanism to limit the actual amount of GHG emissions either at a single source or in the aggregate" (Plan at 50) but ignores the Board's statutory authority to institute those limits. In other words, if a carbon tax underperforms, the Board could adopt the additional measures such as those identified in the No Cap and Trade Scenario, including a more stringent Refinery Rule that achieves a thirty percent (or more) reduction.

204-2 cont.

Third, the Plan states that a carbon tax forgoes existing linkages with the current Cap and Trade program and questions whether a carbon tax would comply with the Clean Power Plan. Proposed Plan at 51. The alternatives analysis should not reject an alternative as infeasible simply because it would not link with one or more Canadian province's cap and trade systems. Linking with other jurisdictions and using Cap and Trade in the Clean Power Plan are not identified as project objectives (EA at 175-177), so rejecting an alternative on these grounds would not comport with CEQA. The Plan implies that other U.S. states in the Western Climate Initiative may adopt Cap and Trade programs, but that prospect has diminished to a near-zero probability with the 2016 Presidential election and the impending rescission of the Clean Power Plan. Finally, even if the Trump EPA retains the Clean Power Plan, the Clean Power Plan itself recognizes that a carbon tax would be a permissible state measures strategy, something the Draft fails to recognize. Proposed Plan at 51; 80 Fed. Reg. 64662, 64836 (Oct. 23, 2015).

Finally, the Draft's analysis reflects a pattern and practice at the Board of inadequate consideration of reasonable alternatives. The 2008 Scoping Plan failed to adequately analyze and consider a carbon tax when the Board opted to pursue Cap and Trade. As a result, the Superior Court held that the Board violated the California Environmental Quality Act. This Draft reflects the same bias

¹⁰ On March 28, 2017, President Trump signed an Executive Order calling for the repeal of the Clean Power Plan.

in favor of Cap and Trade. Instead of misrepresenting a carbon tax as a flawed strategy to bolster the problematic and inequitable Cap and Trade program, the Board should engage in a good faith and reasoned analysis of the benefits that a carbon tax offers.

The Environmental Analysis's evaluation of the carbon tax and cap and tax alternatives improperly finds that the alternative may not meet Objectives 1 and 2 (reduce emissions to meet the 2030 target). With respect to the carbon tax alternative, the EA states that "it is unclear if Alternative 3 would meet 2030 GHG emission reduction targets, because it would depend on market conditions and unforeseeable actions taken by covered entities." With respect to the cap and tax, the EA states "if other measures did not perform as expected, this alternative may not achieve the 2030 target as it would not scale across the industrial and energy sectors." As discussed above, the Board has the authority and duty to review the implementation of this scoping plan and adopt additional measures to ensure the 2030 target is achieved. Moreover, the Board also has the duty to prioritize direct emission reduction measures at stationary sources in the industrial and energy sectors under AB 197. The EA does not explain why the carbon tax or cap and tax alternatives – combined with this authority and duty – would not achieve Objectives 1 and 2. Furthermore, the EA questions both alternatives effectiveness at eliminating leakage in a short, conclusory fashion. The EA improperly dismisses Alternatives 3 and 5 because the EA and the Plan do not explain the factual bases for its conclusory statements and the rationale do not comport with the Board's authority and duty under AB 32, SB 32, and AB 197.

204-2 cont.

Furthermore, the analysis fails to analyze whether the cap and tax alternative would be the environmentally superior alternative. As discussed in section IV, *infra*, the EA does not adequately analyze cap and trade air quality impacts. Alternative 5 does not allow offsets or allowance trading, and includes an emissions cap to drive down reductions. Accordingly, communities would not be denied the benefits of direct emissions reductions under cap and trade and would experience better air quality outcomes as compared to the Proposed Plan.

IV. The Environmental Analysis Fails to Adequately Consider and Analyze Air Quality Impacts from Cap and Trade.

Under CEQA, the Board has an obligation to identify, analyze, and mitigate the environmental impacts of the Proposed Plan. Cal. Code Regs., tit. 14, § 15252; Cal. Code Regs., tit. 17, § 60005(b); California Sportfishing Protection Alliance v. State Water Resources Control Board (2008) 160 Cal. App.4th 1643-45 ("[w]hile the CEQA Guidelines do not directly apply to certified regulatory programs, the information disclosure provisions and broad policy goals of CEQA still apply.").

204-3

When considering the impacts of Cap and Trade on Air Quality, the Environmental Analysis (EA) devotes a cursory two-pages and concludes, without supporting evidence, that because "ARB has received so few years of reported data to date, ARB lacks sufficient information to conclude with

¹¹ Proposed Plan, Appendix F at 182, 184-185.

¹² Id. at 182.

¹³ Id. at 184.

¹⁴The EA finds that Alternative 5 would meet all of the other project objectives, and does not find that there would be increased environmental impacts from implementing Alternative 5. Proposed Plan, Appendix F at 184-185.

certainty that localized emissions increases have not occurred." Proposed Plan, Appendix F at 66. Both the Plan and the EA neither discuss, disclose, or consider the Cushing Report or the OEHHA Report discussed in Section I.A, *supra*. While ARB may or may not have complete implementation data, it has a duty to undertake a good faith analysis and make that analysis available to the public to meaningfully consider the impact of Cap and Trade. ARB also has the duty to analyze the impact of Cap and Trade and mitigate impacts or adopt project alternatives. As the Cushing Report and the OEHHA Report demonstrate, greenhouse gas emissions have increased in some sectors and communities are denied health benefits from direct reductions because co-pollutant increases/decreases are directly correlated to changes in greenhouse gas emissions. This evidence, combined with the Plan's failure to institute AB 197 direct measures impermissibly in favor of Cap and Trade, means that this project will have an impact on air quality and public health. The Plan violates CEQA by failing to analyze and mitigate that impact.

204-3 cont

V. Conclusion

We call on the Board to direct staff to amend the Proposed Plan to remove Cap and Trade as a strategy and to meaningfully incorporate the recommendations of the Environmental Justice Advisory Committee. Furthermore, the Board should support the EJAC's Declaration calling for carbon pricing reform by prioritizing direct emissions reductions and replacing Cap and Trade with a direct carbon pricing system.¹⁵

We look forward to a revised Proposed Plan and a climate policy that places environmental justice at its core. Thank you for your time and courtesy.

Sincerely,

Brent Newell

Center on Race, Poverty & the Environment

Amy Vanderwarker

California Environmental Justice Alliance

Mari Rose Taruc

AB 32 Environmental Justice Advisory Committee, Leadership Team

Tom Frantz

AB 32 Environmental Justice Advisory Committee, Leadership Team

¹⁵ See The California Environmental Justice Advisory Committee's Declaration in Support of Carbon Pricing Reform in California, attached as Exhibit 5.

Phoebe Seaton Leadership Counsel for Justice & Accountability

Martha Dina Argüello Physicians for Social Responsibility – Los Angeles

Tom Frantz Association of Irritated Residents

Tony Sirna Californians for a Carbon Tax

lauren Ornelas Food Empowerment Project

Todd Shuman Wasteful Unreasonable Methane Uprising

Ara Marderosian Sequoia ForestKeeper

Jan Dietrick Ventura County Climate Hub

Colin Bailey
The Environmental Justice Coalition for Water

Gary Hughes Friends of the Earth

Appendix A – Comment Letters

Exhibit 1

RESEARCH BRIEF - SEPTEMBER 2016





A PRELIMINARY ENVIRONMENTAL EQUITY ASSESSMENT OF CALIFORNIA'S CAP-AND-TRADE PROGRAM

By Lara J. Cushing^{1,5} Madeline Wander⁴ Rachel Morello-Frosch^{1,2} Manuel Pastor⁴ Allen Zhu³ James Sadd⁶

University of California, Berkeley

Department of Environmental Science, Policy, and Management

²School of Public Health

3 School of Engineering

"University of Southern California, Program for Environmental and Regional Equity (PERE)

⁵San Francisco State University, Department of Health Education

Occidental College, Department of Geology







OVERVIEW

California's cap-and-trade program is a key strategy for achieving reductions in greenhouse gas (GHG) emissions under AB32, the California Global Warming Solutions Act. For residents living near large industrial facilities, AB32 offered the possibility that along with reductions in GHGs, emissions of other harmful pollutants would also be decreased in their neighborhoods. Carbon dioxide (CO₂), the primary GHG, indirectly impacts health by causing climate change but is not directly harmful to health in the communities where it is emitted. However, GHG emissions are usually accompanied by releases of other pollutants such as particulate matter (PM₁₀) and air toxics that can directly harm the health of nearby residents.

In this brief, we assess inequalities in the location of GHG-emitting facilities and in the amount of GHGs and PM₁₀ emitted by facilities regulated under cap-and-trade. We also provide a preliminary evaluation of changes in localized GHG emissions from large point sources since the advent of the program in 2013. To do this, we combined pollutant emissions data from California's mandatory GHG and criteria pollutant reporting systems, ^{1,2} data on neighborhood demographics from the American Community Survey, cumulative environmental health impacts from the California Environmental Protection Agency's CalEnviroScreen tool, and information from the California Air Resources Board (CARB) about how regulated companies fulfilled their obligations under the first compliance period (2013-14) of the cap-and-trade program. Our methodology is described in greater detail in the appendix to this report.

In this analysis, we focus primarily on what are called "emitter covered emissions," which correspond to localized, in-state emissions (derived mostly from fossil fuels) from industries that are subject to regulation under cap-and-trade. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes).

We found that regulated GHG-emitting facilities are located in neighborhoods with higher proportions of residents of color and residents living in poverty. In addition, facilities that emit the highest levels of both GHGs and PM₁₀ are also more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity cobenefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged communities. In terms of GHG emission trends, in-state emissions have increased on average for several industry sectors since the advent of the cap-and-trade program, with many high emitting companies using offset projects located outside of California to meet their compliance obligations. Enhanced data collection and availability can strengthen efforts to track future changes in GHG and co-pollutant emissions and inform decision making in ways that incentivize deeper in-state reductions in GHGs and better maximize public health benefits and environmental equity goals.

FINDINGS

1. Facilities that emit localized GHGs are located in more disadvantaged communities.

On average, neighborhoods with a facility that emitted localized GHGs within 2.5 miles³ have a 22 percent higher proportion of residents of color and 21 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility. Neighborhoods within 2.5 miles of a facility are also more than twice as likely to be among the worst statewide in terms of their CalEnviroScreen score, a relative ranking of cumulative impact based on indicators of social and environmental stressors to health (Table 1⁴).

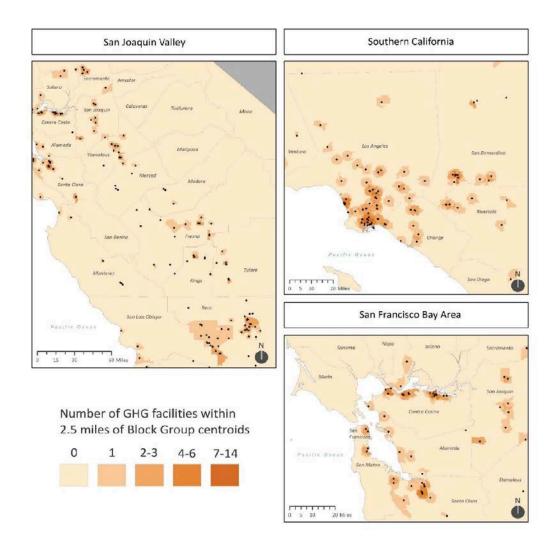
TABLE 1 Characteristics of Neighborhoods within 2.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 2.5 miles (N=6,397)	Block groups with no facilities within 2.5 miles (N=16,705)
Mean % People of Color	66%	54%
Mean % People Living Below Twice the Poverty Level	41%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	17%	7%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	31%	15%

2. Many of California's residential communities are within 2.5 miles of more than one GHG-emitting facility (Figure 1').

These communities are home to a higher proportion of residents of color and people living in poverty than communities with no or few facilities nearby. Indeed, the higher the number of proximate facilities, the larger the share of low-income residents and residents of color (Figure 2).

FIGURE 1
Residential Proximity to Facilities Reporting Emitter Covered GHG Emissions during the 2013-14
Compliance Period (N=321 facilities)



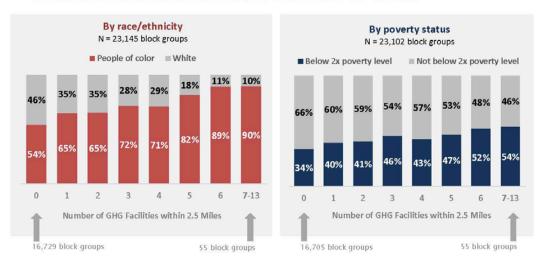
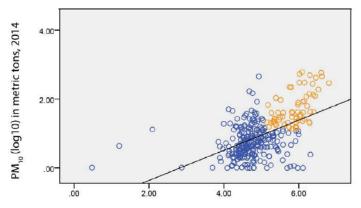


FIGURE 2
Demographics in Block Groups near GHG-emitting Facilities (N=255 facilities)

3. While GHG emissions do not generally have direct health impacts, co-pollutants such as particulate matter (PM₁₀) do. Such emissions are correlated (Figure 3°), with large GHG emitters reporting that they emit more particulate matter. The largest emitters of both GHGs and PM₁₀ also tend to be located near neighborhoods with higher proportions of disadvantaged residents (Table 27).

The neighborhoods within 2.5 miles of the 66 largest GHG and PM₁₀ emitters (defined as the top third in emissions of both PM₁₀ and GHGs and highlighted in orange in Figure 3) have a 16 percent higher proportion of residents of color and 11 percent higher proportion of residents living in poverty than neighborhoods that are not within 2.5 miles of such a facility (Table 2). Compared to other parts of the state, nearly twice as many neighborhoods within 2.5 miles of these highest-emitting facilities are also among the worst statewide in terms of their CalEnviroScreen score. We also found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6 in the Appendix).

FIGURE 3
Correlation between Emitter Covered GHG Emissions and Particulate Matter (N=317 facilities)



Emitter Covered GHG Emissions (log10) in metric tons, 2014

TABLE 2 Characteristics of Neighborhoods within 2.5 miles of the top GHG- and PM_{10} - Emitting Facilities (N=66 facilities)

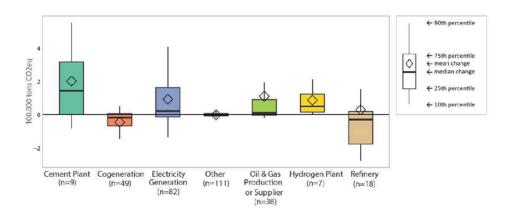
	Block groups within 2.5 miles of the largest GHG and PM ₁₀ emitters (N=1,290)	All other block groups (N=21,812)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	40%	36%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	18%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	35%	19%

4. While overall, GHG emissions in California have continued to drop from a peak in 2001, we find that, on average, many industry sectors covered under cap-and-trade report increases in localized in-state GHG emissions since the program came into effect in 2013.8

Only a portion of the state's total GHG emissions are regulated under the cap-and-trade system. For example, the industrial and electrical sectors accounted for about 41 percent of the state's estimated total GHGs emissions in 2014. (The remainder originated from sectors such as transportation, commercial and residential buildings, and agriculture.) As a result, overall emissions and emissions regulated under cap-and-trade can exhibit slightly different patterns. Moreover, not all emissions regulated under the cap-and-trade program occur in-state. For example, according to CARB's 2016 Edition of the California GHG Emission Inventory, emissions from electrical power decreased by 1.6 percent between 2013 and 2014. However, when these emissions are disaggregated, we see that it is the emissions associated with imported electricity that decreased, while emissions from in-state electrical power generation actually increased.

Figure 4 shows the distribution of the change in localized GHG emissions regulated under cap-and-trade for two time periods: the two years prior and the two years after the program came into effect. We present the range in emissions changes reported by individual facilities within seven industry sectors for 2013-14 versus 2011-12; this includes the median (50th percentile), mean (average), and 10th to 90th percentile of changes in emitter covered emissions for 314 GHG facilities. For example, six of the nine cement plants included in Figure 4 reported increases in emissions during 2013-14 relative to 2011-12. The median value corresponds to the 143,295-ton increase reported by the cement plant in the middle of the distribution (5th highest emitting facility out of the nine total). Similarly, the 25th and 75th percentiles correspond to the increases reported by the 3th and 7th highest emitting facilities. The facilities with the minimum and maximum emissions changes are not shown in this graph to make it more legible; for example, the Cemex Victorville cement plant reported an increase of over 843,000 tons, an amount that far exceeds the range portrayed in Figure 4.

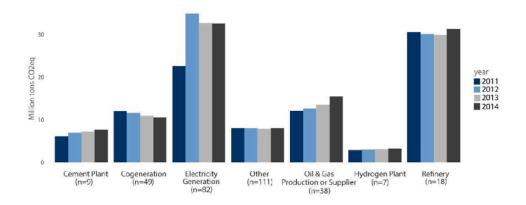
FIGURE 4
Change in Emitter Covered GHG Emissions by Industry Sector (N=314 facilities)



http://dornsife.usc.edu/PERE/enviro_equity_CA_cap_trade

Figure 5 shows temporal trends in total emitter covered emissions (the sum of emissions from all individual facilities) by industry sector for 2011-2014. The number of facilities can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report GHG emissions to CARB. In both Figure 4 and Figure 5, we included only those facilities that: 1) report to the inventory every year during the four-year period, and 2) report at least some emitter covered emissions during those same four years. Again, the upward trend in several sectors is notable.

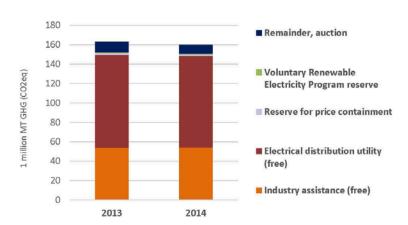
FIGURE 5
Temporal Changes in Total Emitter Covered GHG Emissions by Industry Sector



5. Between 2013 and 2014, more emissions "offset" credits were used than the total reduction in allowable GHG emissions (the "cap"). These offsets were primarily linked to projects outside of California, and large emitters of GHGs were more likely to use offset credits to meet their obligations under cap-and-trade.

The cap-and-trade program requires regulated companies to surrender one compliance instrument—in the form of an allowance or offset credit—for every ton of qualifying GHGs they emit during each compliance period. These instruments are bought and sold on the carbon market. The total number of allowances is set by the "cap," which decreases by roughly 3 percent per year in order to meet GHG reduction targets. In 2013 and 2014, most allowances were given to companies for free for leakage prevention, for transition assistance, and on behalf of ratepayers (Figure 6). Additional offset credits were generated from projects that ostensibly reduce GHGs in ways that may cost less than making changes at a regulated facility.

FIGURE 6
Allocation of Allowances



Regulated companies are allowed to "pay" for up to 8 percent of their GHG emissions using such offset credits. The majority of the offset credits (76 percent) used to date were generated by out-of-state projects (Figure 7). Figure 8 shows that most offset credits were generated from projects related to forestry (46 percent) of and the destruction of ozone-depleting substances (46 percent). Furthermore, over 15 percent of offset credits used during the first compliance period were generated by projects undertaken before final regulations for the cap-and-trade program were issued in 2011, calling into question whether these GHG reductions can be attributed to California's program, or whether they might have happened anyway.

FIGURE 7 Origin of Offset Credits

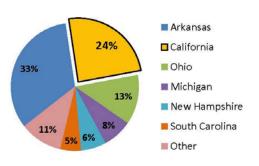
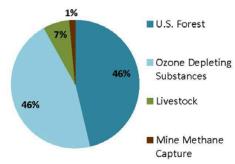


FIGURE 8
Offset Credits by Project Type

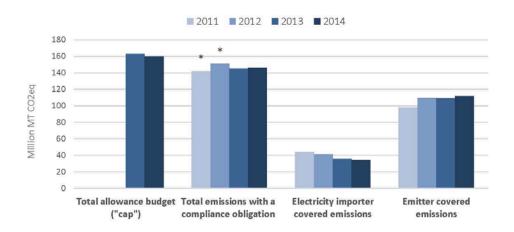


 $http://\ dornsife.usc.edu/PERE/enviro_equity_CA_cap_trade$

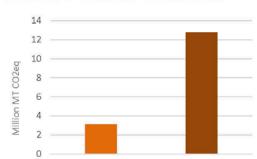
During the first compliance period of 2013-14, the total emissions that were subject to a compliance obligation (the second set of columns in Figure 9) were lower than the cap set by the allowance budget (left-most set of columns in Figure 9). This total includes both the emitter covered emissions that have been the focus of our analysis so far (right-most set of columns in Figure 9) and out-of-state emissions associated with imported electricity (which went down every year during the four-year period as shown by the third set of columns in Figure 9). Offset credits worth more than 12 million tons of CO₂₀₄ were utilized to meet these obligations. These offsets represent 4.4 percent of the total compliance obligation of all regulated companies and over four times the targeted reduction in GHG emissions from 2013 to 2014 as established by the cap (Figure 10).

We found that the majority of companies did not use offset credits to meet their compliance obligation; however, those companies that *did* use offsets tended to have larger quantities of GHG emissions. The top 10 users of offsets account for 36 percent of the total covered emissions and 65 percent of the offsets used. These top offset users included Chevron (1.66 million offsets), Calpine Energy Services (1.55 million offsets), Tesoro (1.39 million offsets), SoCal Edison (1.04 million offsets), Shell (0.62 million offsets), PG&E (0.44 million offsets), Valero (0.43 million offsets), La Paloma Generating Company (0.40 million offsets), San Diego Gas & Electric (0.39 million offsets), and NRG Power (0.33 million offsets).

FIGURE 9
Total GHG Budget



^{*} Only emissions during 2013 and 2014 were subject to a compliance obligation. Estimates of comparable emissions during 2011 and 2012 were derived by summing the "emitter covered" and "electricity importer covered" emissions reported by regulated facilities for those years.



allowance budget from 2013-14 compliance

Decrease in 2014

prior year

FIGURE 10
Offset Credits vs. Decrease in Allowance Cap

CONCLUSIONS

California's efforts to slow climate change by reducing GHG emissions can bring about additional significant co-benefits to health, particularly in disadvantaged communities. Preliminary analysis of the equity implications of California's cap-and-trade program indicates that regulated GHG-emitting facilities tend to be located in neighborhoods with higher proportions of residents of color and residents living in poverty. There is a correlation between emissions of GHGs and PM₁₀, and facilities that emit the highest levels of both GHGs and PM₁₀ are similarly more likely to be located in communities with higher proportions of residents of color and residents living in poverty. This suggests that the public health and environmental equity co-benefits of California's cap-and-trade program could be enhanced if there were more emissions reductions among the larger emitting facilities that are located in disadvantaged communities.

Offsets surrendered,

period

Currently, there is little in the design of cap-and-trade to ensure this set of localized results. Indeed, while the cap-and-trade program has been in effect for a relatively short time period, preliminary evidence suggests that in-state GHG emissions from regulated companies have increased on average for several industry sectors and that many emissions reductions associated with the program were linked to offset projects located outside of California. Large GHG emitters that might be of most public health concern were the most likely to use offset projects to meet their obligations under the cap-and-trade program.

Further research is needed before firm policy conclusions can be drawn from this preliminary analysis. As regulated industries adapt to future reductions in the emissions cap, California is likely to see more reductions in localized GHG and co-pollutant emissions. Thus far, the state has achieved overall emissions reductions in large part by using offsets and replacing more GHG-intensive imported electricity with cleaner, in-state generation. Steeper in-state GHG reductions can be expected going forward if the use of offsets were to be restricted and the opportunity to reduce emissions by replacing imported electricity with in-state generation becomes exhausted.

However, ongoing evaluation of temporal and spatial trends in emissions reductions will be critical to assessing the impact of the cap-and-trade program. Several recommendations would strengthen future analyses and facilitate better tracking of the public health and environmental equity aspects of the cap-and-trade program going forward.

These include:

- Building better linkages between state facility-level databases on GHG and co-pollutant emissions.
 To conduct this preliminary analysis, we had to do a series of matches between datasets with different facility ID codes (see Appendix for details). Harmonization of facility ID codes between relevant data sources could be built into facility emissions reporting requirements going forward in order to facilitate analysis of temporal and spatial GHG and co-pollutant emissions trends.
- · Publicly releasing data on facility- and company-specific allowance allocations.
- Tracking and making data available on facility- and company-specific allowance trading patterns.

Good quality, publicly accessible data and robust analysis will be critical to informing policy discussions and improving regulatory implementation of California's climate law in ways that incentivize deeper instate GHG reductions and that achieve both sustainability and environmental equity goals.

ACKNOWLEDGEMENTS

We thank USC PERE Data Manager Justin Scoggins, Graduate Research Assistant Melody Ng, and Communications Specialist Gladys Malibiran for their assistance in the production of this brief; the California Environmental Justice Alliance for helpful feedback on an early version of this brief; and the Energy Foundation (grant number G-1507-23494), the Institute for New Economic Thinking (grant number INO1500008), and the Resource Legacy Fund for their support of this work.

Cover image credits:

Creative Commons licensed (CC BY 2.0) via Flickr.com - by haymarketrebel - https://flic.kr/p/9mnYHQ Creative Commons licensed (CC BY 2.0) via Flickr.com - by Sharon Rong - https://flic.kr/p/nAnQ2

APPENDIX

This appendix includes a description of the methods used in our preliminary environmental equity assessment of California's cap-and-trade program. We also present supplemental analyses, including a comparison of neighborhood demographics near regulated GHG facilities using different buffer distances to define proximity.

Methods

GREENHOUSE GAS EMISSIONS

To start, we downloaded annual, facility-specific GHG emissions data for 2011-2014 from the Mandatory Reporting of Greenhouse Gas Emissions (MRR) program.¹ The MRR includes self-reported estimates of annual emissions of greenhouse gases (GHGs)—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated GHGs-from regulated industries that have been verified by an independent third party. Emissions are given in units of CO2-equivalents, a metric that combines the quantity of individual gases emitted with the potency of each gas in terms of its contribution to climate change over a 100-year time frame (also known as "global warming potential"). Our analysis focused on one class of emissions included in this database called "emitter covered emissions," which corresponds to localized, in-state emissions resulting from "the combustion of fossil fuels, chemical and physical processes, vented emissions...and emissions from suppliers of carbon dioxide"11 as well as emissions of GHGs other than CO. from biogenic fuel combustion. The term "covered" refers to the fact that these emissions are subject to a compliance obligation under the cap-and-trade program; releases of CO2 that result from the combustion of biogenic fuels, for example, are exempted. The cap-and-trade program also regulates out-of-state emissions associated with electricity imported into the state and, beginning in 2015, began regulating distributed emissions that result from the burning of fuels such as gasoline and natural gas in off-site locations (e.g., in the engines of vehicles and in homes); although we did not analyze distributed emissions in this report, this category of emissions will be a future research topic.

The number of facilities reporting to the MRR can change from year to year due to shutdowns, startups, and changes in emissions that affect whether facilities are required to report. In our analysis of trends in emissions across industry sectors, we excluded facilities that did not report to the emissions inventory every year during 2011-14, as well as facilities that reported no emitter covered emissions during the four-year period. Facilities were categorized according to the sector reported in the MRR with slight modifications to reduce the number of categories. Facilities described as a refinery alone or in combination with any of the following were categorized as a refinery: hydrogen plant, CO₂ supplier, or transportation fuel supplier. Facilities described as "other combustion source" or "other combustion source" were categorized as "other."

We determined or confirmed the geographic location of each facility using a variety of data sources and methods. Geographic point locations for some facilities were obtained directly from the California Air Resources Board (CARB), and facility addresses reported in CARB's online GHG visualization tool were geocoded. ¹² We located some sites using individual internet searches. All locations inside California were visually confirmed, and point locations were adjusted for accuracy using aerial imagery in Google Earth Pro.

CO-POLLUTANT DATA (PM10)

We obtained emissions of criteria air pollutants from the California Emission Inventory Development and Reporting Systems (CEIDARS) database for years 2011-14.² Reporting requirements, including the way in which facilities are defined, the numeric identifier attached to each facility, and the frequency of reporting, differ between CEIDARS and the MRR GHG database. This presents a challenge for combining emissions estimates from the two sources. In particular, criteria air pollutants are not required to be reported annually, and emissions estimates contained in the 2014 CEIDARS database may correspond to estimates from prior years. We joined data on PM₁₀ emissions from the 2014 CEIDARS with GHG emissions information from the MRR GHG database based on the facility name, city, and ZIP code. For some GHG facilities listed in the MRR GHG database, we obtained addresses from CARB's Facility GHG Emissions Visualization and Analysis Tool. ¹² Since the CEIDARS database also contains addresses, we were able to use the address field to confirm and find additional matches. When all variables (facility name, city, and ZIP code) did not match between the two data sources, matches were confirmed by hand through internet searches of company websites and online databases containing facility names and addresses.

NEIGHBORHOOD DEMOGRAPHICS AND CUMULATIVE IMPACT

We defined neighborhoods on the basis of 2010 vintage Census block group boundaries provided by the U.S. Census. ¹³ Block group centroids were created by using the point-to-polygon tool in ArcGIS and the distance between block group centroids and GHG facility locations was calculated using the point-distance tool in ArcGIS (ESRI, Redlands, CA).

Demographic information for each block group was obtained from the 2014 5-year American Community Survey estimates. White individuals were defined as those who self-identified as white but not Hispanic. People of color were defined as all other individuals, including those who identified as multiracial or of Hispanic ethnicity. Poverty was defined as twice the federal poverty level (FPL) to reflect increases in the cost of living since the FPL was established and California's high cost of living.

CalEnviroScreen is a state-level screening tool developed by the California Environmental Protection Agency that helps identify California communities that are disproportionately burdened by multiple sources of pollution. It includes indicators of proximity to environmental hazards and population vulnerability to derive a relative score of cumulative environmental health impact. We assigned block groups the most recent CalEnviroScreen score of their census tract in order to compare CalEnviroScreen rankings near GHG facilities to the rest of the state. Figure 11 summarizes the construction of our facility-level dataset.

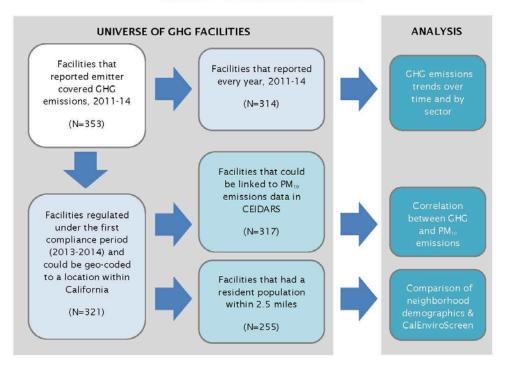


FIGURE 11 - Construction of the Dataset

ALLOWANCES AND OFFSETS

Unlike the emissions data, information on the allocation of allowances and ways in which regulated industries are complying with the cap-and-trade program is reported on an industry- and company-specific basis, rather than at the facility level. One company may own several regulated facilities. Information on the allocation of allowances was compiled from the California Code of Regulations (17 CA ADC § 95841 and 17 CCR § 95870) and CARB publications on the public allocation of allowances and estimates of state-owned allowances. We obtained the number of allowances and offsets surrendered by each company at the completion of the first compliance period from CARB's 2013-14 Compliance Report. Information on individual offset projects was compiled from CARB documents on offsets issued as of August 10, 2016 and individual project descriptions provided in the American Carbon Registry and Climate Action Reserve carbon offset registries.

Supplemental Analyses

Consistent with the findings presented in Table 1 in the main text, Table 3 shows that neighborhoods within 1.5 miles of a facility with localized GHG emissions have a 16 percent higher proportion of residents of color, a 26 percent higher proportion of residents living in poverty, and a higher likelihood of scoring among the worst statewide in terms of their CalEnviroScreen score than neighborhoods that are not within 1.5 miles of such a facility. Table 4 and Table 5 show similar trends when neighborhoods up to a larger distance of 3.5 and 6 miles away are considered. These results confirm that the findings presented in our main analysis were not sensitive to our choice of buffer distance.

TABLE 3
Characteristics of Neighborhoods within 1.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 1.5 miles (N=2,710)	Block groups with no facilities within 1.5 miles (N=20,392)
Mean % People of Color	66%	57%
Mean % People Living Below Twice the Poverty Level	44%	35%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	20%	9%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	36%	18%

TABLE 4
Characteristics of Neighborhoods within 3.5 miles of GHG-emitting Facilities (N=255 facilities)

	Block groups with at least one facility within 3.5 miles (N=9,991)	Block groups with no facilities within 3.5 miles (N=13,111)
Mean % People of Color	66%	51%
Mean % People Living Below Twice the Poverty Level	39%	33%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	15%	6%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	29%	13%

TABLE 5
Characteristics of Neighborhoods within 6 miles of GHG-emitting Facilities (N=255 facilities)

Block groups with at least one facility within 6 miles (N=16,365)	Block groups with no facilities within 6 miles (N=6,737)
65%	41%
37%	32%
13%	3%
25%	7%
	one facility within 6 miles (N=16,365) 65% 37%

In the main text, we defined the 66 largest GHG and PM_{10} emitting facilities as those that were within the top third in terms of their 2014 emissions of both PM_{10} and localized GHGs, and highlighted them in orange in Figure 2. We found that 40 (61 percent) of these high-emitting facilities reported increases in their localized GHG emissions in 2013-14 relative to 2011-12, versus 51 percent of facilities overall. Neighborhoods near the top-emitting facilities that increased emissions had higher proportions of people of color than neighborhoods near top-emitting facilities that decreased their emissions (Table 6).

TABLE 6
Characteristics of Neighborhoods near top GHG- and PM₁₀-Emitting Facilities that Increased and Decreased GHG Emissions (N=66 facilities¹⁹)

	Block groups within 2.5 miles of at least one top emitting facility that increased GHG emissions (N=675)	Block groups within 2.5 miles of at least one top emitting facility that decreased GHG emission: (N=669)
Mean % People of Color	74%	58%
Mean % People Living Below Twice the Poverty Level	46%	34%
% of Block Groups in a "Top 10%" CalEnviroScreen tract	25%	14%
% of Block Groups in a "Top 20%" CalEnviroScreen tract	46%	28%

ENDNOTES

- ¹ Mandatory Reporting of Greenhouse Gas Emissions (MRR), http://www.arb.ca.gov/cc/reporting/ghg-rep/reporteddata/ghg-reports.htm.
- CEIDARS, http://www.arb.ca.gov/ei/disclaim.htm; http://www.arb.ca.gov/ei/drei/maintain/dbstruct.htm.
- OHC facilities were limited to those that report emitter covered emissions during the first compliance period of capand-trade (2013-14), could be geo-coded in California, and had a resident population within 2.5 miles (N=255). We define neighborhoods using Census block groups. Residential proximity to a GHG facility was based on the distance between the facility location and each block group's centroid. We chose a 2.5 mile distance due to its common use in
- other environmental justice analyses. The Appendix gives results using alternative distance buffers.

 * For calculations in Table 1, we used the universe of block groups for which there are valid data (i.e., non-missing data) for all four measures shown. However, the results were the same when we included all block groups with valid data for each measure on an individual basis.
- ⁵ The map in Figure 1 shows 66 additional facilities that are not included in Table 1 and Figure 2 because they are not
- within 2.5 miles of a block group centroid with a resident population. See Figure 11 in the Appendix for details.

 Because there are several PM_{10} values that are between zero and one metric ton, in Figure 3 we added 1 to the PM_{10} value for all facilities prior to taking the log10 to avoid reporting negative values
- Similar to Table 1, for calculations in Table 2, we used the universe of block groups for which there are valid data (i.e., non-missing data) for all four measures shown. However, the results were the same when we include all block groups with valid data for each measure on an individual basis.
- ⁸ The results were qualitatively similar when we compared 2014 emissions to 2012 emissions. That is, the median and mean for each industry sector were in the same direction as shown in Figure 4 (above, near, or below zero), with one major exception: electricity generators on average decreased their emitter covered emissions in 2014 relative to 2012. California GHG Emission Inventory, 2016 Edition,

http://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

- ¹⁰ Some have critiqued the appropriateness of forestry projects for carbon offset purposes. For example, tree planting projects can take decades to reach maturity in terms of their ability to sequester carbon. Younger trees sequester less carbon and often take decades to fully mature. Moreover, it is challenging to measure and quantify the ability of forestry projects to sequester carbon over time. In particular, the permanence of forestry projects cannot be guaranteed as they remain susceptible to fire, disease, natural decay, clearing, or mismanagement. Forestry projects are also vulnerable to "leakage." This refers to the fact that, unless global demand for wood products goes down, a reduction in logging in one location can simply result in greater deforestation in another location.
- (See http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=0 and http://www.web.uvic.ca/~repa/publications/REPA%20working%20papers/WorkingPaper2007-02.pdf for overviews of these issues.)
- https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2014-ghg-emissions-2015-11-04.xlsx
- http://www.arb.ca.gov/ei/tools/qhg_visualization/ https://www.census.gov/geo/maps-data/data/cbf/cbf_blkgrp.html
- http://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20
- http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/publicallocation.htm;
- http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-ng-allowancedistribution/electricity-allocation.pdf; http://www.arb.ca.gov/cc/capandtrade/stateauction.htm
- http://www.arb.ca.gov/cc/capandtrade/2013-2014compliancereport.xlsx
- http://www.arb.ca.gov/cc/capandtrade/offsets/issuance/arb_offset_credit_issuance_table.pdf
- http://americancarbonregistry.org; http://www.climateactionreserve.org
- 66 GHG facilities fell in the top third in terms of both PM₁₀ and localized GHG emissions. We found that 40 of these facilities increased localized GHG emissions, 23 decreased emissions, and three did not report to the database all four years (2011-2014) so we could not determine an increase or decrease.

Appendix A – Comment Letters

Exhibit 2

Bulletin of the Atomic Scientists

IT IS 5 MINUTES TO MIDNIGHT



Feature

How California's carbon market actually works

Bulletin of the Atomic Scientists
2014, Vol. 70(5) 35–44
© The Author(s) 2014
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0096340214546834
http://thebulletin.sagepub.com



Danny Cullenward

Abstract

Almost 10 years ago, California's legislature passed Assembly Bill 32, the Global Warming Solutions Act of 2006. AB 32 set the most ambitious legally binding climate policy in the United States, requiring that California's greenhouse gas emissions return to 1990 levels by the year 2020. The centerpiece of the state's efforts—in rhetorical terms, if not practical ones—is a comprehensive carbon market, which California's leaders promote as a model policy for controlling carbon pollution. Over the course of the past 18 months, however, California quietly changed its approach to a critical rule affecting the carbon market's integrity. Under the new rule, utilities are rewarded for swapping contracts on the Western electricity grid, without actually reducing greenhouse gas emissions to the atmosphere. Now that the Environmental Protection Agency is preparing to regulate greenhouse gases from power plants, many are looking to the Golden State for best climate policy practices. On that score, California's experience offers cautionary insights into the challenges of using carbon markets to reduce greenhouse gas emissions.

Keywords

California, cap-and-trade, carbon market, climate policy, emissions, leakage, resource shuffling

or years, Southern California Edison imported electricity from the Four Corners Power Plant, a coal-fired facility in northwestern New Mexico. When California's groundbreaking carbon market took effect in 2013, Edison, like all other in-state utilities, became responsible for the climate pollution from its generating fleet. A few months later, the company sold its interest in the coal plant to an Arizona utility (APS, 2013). Whatever replacement supplies Edison selects will be cleaner than coal, the most carbonintensive fossil fuel, and Edison will

or years, Southern California report reduced emissions in California's Edison imported electricity from carbon market.

At first this sounds like a positive story: Policy puts price on carbon, pollution falls. But this transaction will not reduce net greenhouse gas emissions to the atmosphere. The coal plant will keep emitting pollution just as before—only now it serves customers in Arizona, not California.

As it has with many other environmental issues before, California aims to set an example for the United States on climate policy. The key to its success, according to state officials, is a comprehensive carbon mar-"good policy design, ket—featuring clear oversight and strong enforcement" (Nichols, 2014). Ironically, one of the most visible consequences of the market's first year is a rush to swap coal power imports for cleaner replacements, limiting the extent to which California's policy leadership actually helps the climate. Is this perverse outcome the unavoidable consequence of California acting without its neighbors' support, or could the state have done more to ensure that its market creates real environmental benefits?

An efficient theory

The slow birth of American climate policy coincides with a transition in the way our country manages its environmental problems. Most of our national environmental laws were drafted at a time when both political parties supported government regulation of the private sector. That was, of course, a different era. Since then, the center of national political opinion has shifted dramatically in favor of the free market. And that trend is visible in contemporary environmental policy, which, over the last few decades, has moved away from traditional regulatory approaches to controlling pollution. Flexible, market-based mechanisms are now the preferred route.

The thinking goes something like this: Rather than impose specific requirements on individual companies or industries, it is more efficient for the government to set economy-wide policy targets and let the private sector find the cheapest way to meet them. In theory, this not only increases the flexibility of regulated industries' compliance options but also reduces the policy's

administrative complexity. Thus, if done right, economic approaches to environmental policy should result in a win-win.

Enter a uniquely American invention, the carbon market—also known as emissions trading or cap-and-trade. The idea is simple, though the practice is not. Economic theory says that all a government needs to do is: set a quantitative cap on emissions; create and freely distribute or auction emissions permits, with the total number of permits equal to the cap; and require polluters to turn in a permit for each unit of pollution they emit. With this framework in place, the government steps back to let the private sector do what it does best: trade permits to minimize costs.

The most critical component of a carbon market is the cap. Typically, the cap is expressed as a maximum quantity of emissions allowed in any given year, with each year's limit declining toward a long-term goal. Think of it like a game of musical chairs—with carbon pollution as the players, and the chairs representing emissions permits. At the end of every year, the music stops and the players must seat themselves. When there are more people than chairs, market forces dictate who leaves the game and who can stay; the government's role in this analogy is only to set up the rules and remove the correct number of chairs at each stage. So long as the government counts the right number of chairs, everything should work out fine.

California's climate policy

After the United States withdrew from the Kyoto Protocol and elected George W. Bush, whose administration strongly opposed legally binding federal climate Cullenward 37

policy, momentum shifted to the states. California moved to claim its traditional role as an environmental policy leader by passing AB 32, the Global Warming Solutions Act of 2006. Most notably, this bill requires California's emissions to fall to 1990 levels by the year 2020. AB 32 also designated a primary regulator, the California Air Resources Board (CARB), making CARB responsible for developing specific policies and measures that would lead California to its 2020 target.

The key to understanding California's climate policy system lies in recognizing the overlapping structure of the instruments that CARB and other agencies eventually adopted. Arguably the state's best-known climate policy is its comprehensive carbon market, which CARB designed and implements. At the same time, California has a number of robust regulatory programs that apply to sectors that are also covered by the carbon market. For example, California has one of the strongest renewable portfolio standards (requiring utilities to purchase 33 percent of their electricity from renewable sources by 2020), as well as world-class energy efficiency programs and a clean transportation fuels policy.

Climate experts refer to these programs as "complementary policies"—a phrasing that suggests they exist to support the primary instrument, a carbon market. In practice, however, the complementary policies do most of the work. When CARB created its plan for meeting California's 2020 emissions target, it relied on complementary policies for approximately 80 percent of the reductions, leaving a mere 20 percent to "additional reductions" in the sectors covered by the state carbon market (CARB, 2008)—meaning that most of the emissions reductions being accomplished by individual policies, not driven by the comprehensive market price on carbon. As my colleague Michael Wara (2014) explains elsewhere in this issue, the complementary policies effectively hide the true cost of California's climate policy: Because most of the necessary emissions reductions are required by separate regulation, rather than left to the carbon market, the carbon price reflects only a fraction of the state's climate policy efforts.²

California's market design

California benefits from the experience of the emissions trading systems that came before it. By carefully observing the early years of the European Union's Emissions Trading Scheme (ETS), for example, CARB was able to avoid many of the hiccups that confronted its predecessors. These successes are all the more laudable because California has implemented the most comprehensive market to date. While the northeastern states' Regional Greenhouse Gas Initiative controls only emissions from power plants, California's market currently covers the power and industrial sectors (as does the European ETS), and will expand next year to include the transportation fuels and natural gas sectors. All told, this will encompass about 85 percent of the state's total emissions-a comprehensive policy by any standard.

On the other hand, California faces many new challenges that previous markets never had to address. In particular, the state must contend with the fact that it is only a small part of a regional electricity transmission grid stretching from the Pacific Ocean to the Rocky Mountains. The scale of the Western grid matters because California is a

significant net importer of electricity. Recognizing that the emissions profile of its electricity imports is part of California's carbon footprint, regulators rightly included electricity imports in the cap-and-trade program. But geography introduced new headaches. Because California is the only western state that prices its greenhouse gas emissions, utilities and power traders now face an incentive to swap their highemitting imports for cleaner replacements—a practice known as resource shuffling. (Recall the earlier example of Southern California Edison divesting its interest in a New Mexico-based coal power plant: Emissions reported in California go down, but emissions across the western United States do not change.)

If utilities are allowed to shuffle electric power imports, the emissions reductions they report in California's carbon market will not reflect reduced emissions to the atmosphere. Instead, the dirty resources California utilities divest will continue polluting the air under new, unregulated ownership. Given this dilemma, what should carbon market regulators do?³

A quiet coup

As it happens, the California Legislature anticipated these concerns. When the legislature delegated broad authority to CARB to create climate policy, it also issued guidelines that the regulator must incorporate in its policies. Specifically, state law requires that "to the extent feasible," climate regulations must "minimize leakage." California law defines leakage as "a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state." 5

In plain English, this requirement means that CARB should not give credit to actions that merely shift the responsibility for greenhouse gas emissions beyond state borders. Instead, AB 32 dictates that CARB should only recognize net reductions in emissions to the atmosphere. For a time, CARB followed this instruction. Its initial carbon market regulations banned resource shuffling, and went so far as to require companies' executives to attest that they were not engaged in this practice.⁶

But this approach proved controversial. In the months leading up to the beginning of the market's first compliance period, several stakeholders objected to the resource shuffling rules and began agitating for reforms. The first public proposal came from California's investor-owned utilities, which in September 2012 advocated a series of exemptions to the prohibition on resource shuffling (Joint Utilities Group, 2012). The following month, CARB directed its staff to develop modifications to the resource shuffling regulations, providing 13 fully developed "safe harbor" exemptions to the definition of resource shuffling (CARB, 2012a)—directly comparable to, if not more permissive than, the Joint Utilities Group proposal. A few weeks later, CARB staff released a new regulatory guidance document that incorporated these safe harbors, almost word for word (CARB, 2012b).

When a regulator issues a guidance document that publicly describes how to interpret its rules, that description provides a legal defense to any private party that reasonably relies upon it. After all, it would be extremely unfair if following the regulator's own advice could get one in legal trouble. But consider what this meant for the carbon

Cullenward 39

market. On the eve of the program's launch in January 2013, the regulator quietly rewrote its own rules through informal guidance documents. Formally, its regulations prohibited resource shuffling. Yet CARB's own guidance document indicated that this straightforward prohibition would not apply to 13 broad categories of transactions. Thus, when the market began operation in 2013, its practical function had already diverged from its formal legal rules.

The market springs a leak

My colleague David Weiskopf and I had been studying CARB's resource shuffling rules during this tumultuous time. We recognized that CARB faced an incredibly difficult task in writing effective and legally permissible cross-border accounting rules, yet we were surprised at the scope of CARB's informal guidance document. We believed that a compromise was possible, to give utilities clear and flexible rules without undermining the environmental integrity of the market.

Meanwhile, we were deeply concerned that the informal guidance document effectively revoked the prohibition on resource shuffling. We published our analysis of the safe harbors and the leakage risks they created in July 2013 (Cullenward and Weiskopf, 2013). Most important, we described how several of the safe harbors were broader than the underlying prohibition. In addition, we pointed out that two safe harbors explicitly allowed California utilities to divest their long-term contracts with out-of-state coal power plants.

As it happens, these coal power imports account for a significant portion of California's emissions. We calculated that if California utilities relied on the safe harbors to divest from just six coal power plants, they could cause between 108 and 187 million tons of carbon dioxide to leak out of California's market—a quantity that is roughly equivalent to the expected size of the market, after accounting for the likely impact of the complementary policies. Furthermore, we realized that our analysis was consistent with calculations from CARB's own economic advisory committee, called EMAC, which found that resource shuffling of all types could lead to leakage of between 120 and 360 million tons of carbon dioxide (Borenstein et al., 2013). (The EMAC report did not assess whether the safe harbors would enable leakage; it looked only at what the effects of resource shuffling would be if there were no prohibition against it.)

In addition to presenting our concerns, we also developed a complete regulatory text to implement an alternative approach to controlling resource shuffling. Even if our suggestions could have been helpful, they probably arrived too late. That same month, CARB hosted a workshop to consider draft regulatory amendments that would codify the safe harbors into law. As it became clear that CARB would proceed without any public acknowledgement of the leakage problem, I wrote an op-ed in the San Jose Mercury News raising the issues described here (Cullenward, 2013a), as well as two comment letters addressing the technical and legal questions in the formal administrative process (Cullenward, 2013b, 2014a).

Over the following months, three of the six coal power plants that Weiskopf and I identified became involved in resource-shuffling-related transactions, leaking between 30 and 60 million tons of carbon dioxide out of California's carbon market (Cullenward, 2014b). Two of these contracts have already left the regulatory system, while a thirdunder which the Los Angeles utility LADWP imports power from the coalfired Navajo Generating Station on tribal lands in Arizona-is on its way out. In a regulatory filing connected with its purchase of replacement power, LADWP even disclosed that a benefit of divestment from the Navajo Generating Station would be "relieving LADWP from having to purchase emission credits" in the carbon market (LADWP, 2013: 3). Yet, as I pointed out in my second comment letter to CARB (Cullenward, 2014a), there is little doubt that the utility's divestment plan fits squarely in one or more of the safe harbors, and therefore does not violate CARB's guidance. By the time CARB unanimously voted to approve its new regulations, it had substantial evidence that its safe harbors were facilitating significant leakage—despite AB 32's clear requirements to the contrary.

A weak cap

What does leakage mean for California's climate policy? First and foremost, it means the "cap" in cap-and-trade is much less than it seems.

Return for a minute to the analogy of carbon markets as a game of musical chairs. Earlier, I suggested that so long as the government sets out the right number of chairs (a shrinking supply of emissions permits), the game should run smoothly. But resource shuffling essentially allows players to leave the game—say, by offering them an open spot on a comfortable couch in a nearby room. If resource shuffling is allowed, counting the number of chairs no longer provides reliable information about the environmental performance of the system.

And that's the major flaw in California's system. Now that resource shuffling is happening, we know that California's supposed reductions reflect bad bookkeeping, because the market cap is no longer firm. If the remaining coal power imports leave the carbon market, or if utilities take full advantage of the other safe-harbor provisions, a significant majority of the market's apparent emissions reductions will be attributable to leakage, not progress.

Although the market is no longer producing the net emissions reductions for which it was designed, it does have other, positive impacts. Notably, it sets a minimum price, which was \$11.34 per metric ton of carbon dioxide in July 2014. The price had previously ranged from approximately \$13 to \$20 per ton, but began a steady decline in approximately July 2013. As this article went to press, it rested slightly above the price floor, as can be seen at the California Carbon Dashboard website (http://calcarbondash.org). These data show that an oversupply of emissions permits—caused in no small part by reduced demand due to resource shuffling-has crashed the market price down to its legal minimum.

Curiously, so long as these conditions persist, the market actually looks like a carbon tax. In other words, after years of complex negotiations, emissions trading, and hundreds of pages of market rules, California's market operates much like the carbon tax (or "fee") policies preferred by both moderate Republicans (Paulson, 2014; Shultz and Becker, 2013) and grassroots environmentalists (Citizens' Climate Lobby, 2014)—only without the transparency and accountability mechanisms that motivate many of these advocates' positions. Perhaps simplicity is a virtue in climate policy after all.

Cullenward 41

In all fairness, California has managed to create the highest price on carbon pollution in the United States. It also has robust energy policies that are encouraging the expanded use of clean and efficient resources. These are all significant accomplishments, but the carbon price is still too low to do much good. We know it is lower than the actual cost of California's clean energy policies—for example, CARB reports that California's clean fuels policy credits were trading between \$63 and \$79 per metric ton of carbon dioxide during the last three months of 2013 (CARB, 2014), well above the carbon market price-and therefore the carbon market is not driving compliance in those sectors. In any case, the market price is certainly lower than the levels needed for the long-term transformation of the energy system.

A cautionary tale

Can anything be done about the failure of California's flagship carbon market to live up to expectations? Yes, but the political challenges are far greater than the technical issues. At this point, there is only one solution that can preserve the market's integrity: CARB must observe the leakage that results from its permissive resource shuffling rules, then tighten the overall market cap accordingly. (In my musical chairs analogy, this means removing a chair for every person who leaves the game before the music stops.) But acknowledging and resolving the problem will likely increase the carbon market price, and hence political opposition.

Some stakeholders prefer to place hope in new developments in state and federal climate policy. They argue that resource shuffling will be less of a problem if enough of California's neighbors adopt their own climate regulations. For example, the leaders of California, Oregon, Washington, and British Columbia signed an agreement to harmonize their approach to climate policy (Center for Climate and Energy Solutions, 2013). There is little chance, however, of a similar agreement with southwestern states. where most of California's legacy coal power imports originate. Waiting for the Environmental Protection Agency to act isn't an option, either. Assuming that the EPA's proposed rules are finalized and survive intense litigation, they won't produce results until after 2020, the current end date for California's legally binding market. (Moreover, the proposed federal rules do not apply to tribal lands. yet two of the three coal-fired power plants that have already leaked from California's market are located in Navajo territory.) Thus, the prospects for California's neighbors to independently resolve this problem are dim.

Even if CARB fails to address the leakage issue, California's experience offers useful insights into the politics of climate policy-though the precise lessons depend on one's point of view. The optimistic perspective looks something like this: Perhaps the flaws in the current plan reflect realistic concessions on the road to deep, long-term emissions reductions. (State policy makers are currently discussing how to set a goal for 2030 and have a nonbinding aspirational target of reducing emissions 80 percent below 1990 levels by 2050.) Even the most proactive government officials have to navigate a maze of political obstacles, technically complex issues, and the constant threat of litigation—especially when working on controversial issues such as climate policy, which challenges powerful established interests.

Sometimes policy makers make mistakes, and sometimes they make compromises. Whatever the case here, the good news is that a state can only rely on leakage once: After the high-emitting resources are gone, there are no more opportunities for resource shuffling. Instead of fighting over complex market rules, climate policy makers should focus on raising the minimum market price in future reforms. Their critics should remember that the complementary policies are unaffected by a weak market cap.

Taking a less optimistic perspective, one might question the credibility of the market regulators. At the end of the day, CARB let the utilities write their own rules. Whether CARB intended to rely on leakage to artificially lower the market price, or simply didn't understand what its economic advisers were saying about the probable consequences of these reforms, it deferred to the industry it was charged with regulating. Political realists who worry about costs should also be concerned with the environmental performance of policy instruments designed to keep costs low; California will need these policies to work if it is to achieve long-term climate targets. Equally important is consistency with the rule of law, which will be necessary to strengthen climate policy over the coming decades. From this perspective, relying on questionable accounting tricks is hardly the mark of a strong regulator that is prepared to impose tough rules for 2030 and beyond.

If there is a broader lesson in California's experience, it is this: The political and technical challenges of implementing climate policy are greater than most people appreciate—even within the expert community, which tends to view

carbon markets as both eminently tractable (Newell et al., 2014) and politically expedient (Stavins, 2014). It is not enough to pass legislation or propose new regulations. Indeed, that is only the beginning.

Acknowledgements

Thanks to Jonathan Koomey, Michael Wara, and David Weiskopf for their feedback and insights. Any errors and all opinions are my own.

Funding

This research received no specific grant from any funding agency in the public, commercial, or notfor-profit sectors.

Notes

- I. Many people incorrectly think of the carbon market as a European invention because the European Union was the first to apply it to climate policy. Europe did create the world's largest carbon market, the EU Emissions Trading Scheme, as part of its Kyoto Protocol obligations (Ellerman et al., 2007). Nevertheless, emissions trading actually got its start in the United States. For example, the US Environmental Protection Agency developed capand-trade markets to control lead in gasoline in the 1980s (Stavins, 2014) and for sulfur dioxide pollution from power plants in the 1990s (Ellerman et al., 2000).
- 2. This is not to say that California's climate policy is too expensive. My point is merely that the apparent cost observed in the carbon market is significantly lower than the true cost.
- 3. This challenge is not unique to California; it applies to nearly all sub-national carbon markets, including the Regional Greenhouse Gas Initiative and the pilot programs in China (Cullenward and Wara, 2014). So long as the carbon market is smaller than the region's electricity market, cross-border accounting issues will be present.
- 4. See California Health and Safety Code (2014: §§ 35852(b), (b)(8)).

Cullenward 43

- 5. See Legislative Counsel of California (2014: § 38505(j)).
- See California Code of Regulations (2014: § 95852(b)(2)). The attestation requirement was suspended soon after adoption and recently repealed in its entirety.
- 7. Although advocates of these policies use different terminologies, they share the common goal of putting a price on emissions—for all practical purposes, a tax. But framing matters in politics. Citizens' Climate Lobby eschews "tax" and prefers "fee and dividend," returning all revenue back to households. Shultz and Becker promote a "revenue-neutral carbon tax," which they distinguish from other taxes by requiring that all revenues be returned to individual (and potentially corporate) taxpayers. Finally, others, like Paulson, refer simply to a carbon tax, without specifying how the revenue would be used.

References

- APS (2013) APS completes purchase at Four Corners Power Plant. December 31. Available at: www.aps. com/en/ourcompany/news/latestnews/Pages/ aps-completes-purchase-at-four-corners-powerplant.aspx.
- Borenstein S, Bushnell J, Wolak FA et al. (2013) Forecasting supply and demand balance in California's greenhouse gas cap and trade market. Emissions Market Assessment Committee draft, June 12. Available at: web.stanford.edu/group/fwolak/ cgi-bin/sites/default/files/files/POWERv8_june_ 2013.pdf.
- California Air Resources Board (CARB) (2008)
 Climate change scoping plan: A framework for change. December. Available at: www.arb.ca. gov/cc/scopingplan/document/scopingplan document.htm.
- California Air Resources Board (CARB) (2012a) California cap-and-trade program, Resolution 12-51, Attachment A. October 18. Available at: www.arb. ca.gov/cc/capandtrade/resolutions/resolutions. htm.
- California Air Resources Board (CARB) (2012b) Capand-trade regulation instructional guidance, Appendix A: What is resource shuffling? November. Available at: www.arb.ca.gov/cc/capand-trade/guidance/appendix_a.pdf.
- California Air Resources Board (CARB) (2014) 2013 LCFS reporting tool (LRT) quarterly data summary—

- Report no. 3. January 27. Available at: www.arb.ca.gov/fuels/lcfs/20140123_q3datasummary.pdf.
- California Code of Regulations (CCR) (2014) Title 17,
 Division 3, Chapter 1, Subchapter 10, Subarticle 7.
 Available at: http://govt.westlaw.com/calregs/
 Browse/Home/California/California CodeofRegulations?guid=I3984AFF1E67711E2960
 E9FD1BEAA332C.
- Center for Climate and Energy Solutions (2013) Pacific Coast pact ushers in climate policy alignment.

 Available at: www.c2es.org/us-states-regions/news/2013/pacific-coast-pact-ushers-climate-policy-alignment.
- Citizens' Climate Lobby (2014) Carbon fee and dividend FAQ. Available at: http://citizensclimatelobby.org/about-us/faq/.
- Cullenward D (2013a) Danny Cullenward: Don't let accounting tricks dominate the carbon market. San Jose Mercury News, October 21. Available at: www.mercurynews.com/opinion/ci_24354840/danny-cullenward-dont-let-accounting-tricks-dominate-carbon.
- Cullenward D (2013b) Proposed amendments to the California cap-and-trade program (September 4, proposed regulation order). Letter to the Air Resources Board, October 23. Available at: www.arb.ca.gov/lists/com-attach/4-acc2013-VDcAc1 wxAzwBYgZo.pdf.
- Cullenward D (2014a) Comments on proposed capand-trade regulations, 15-day changes, resource shuffling safe harbors—§ 95852(b). Letter to the Air Resources Board, April 4. Available at: www.arb.ca.gov/lists/com-attach/253-capandtrade13-ViVcNVY6UW9WNQln.pdf.
- Cullenward D (2014b) Leakage in California's carbon market: Preliminary trading is consistent with expected impacts of regulatory changes. University of California, Berkeley, working paper, June 21. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2458773.
- Cullenward D and Wara M (2014) Carbon markets: Effective policy? Science, June 27. Available at: www.sciencemag.org/content/344/6191/1460.2. full.
- Cullenward D and Weiskopf D (2013) Resource shuffling and the California carbon market. Stanford Law School ENRLP Program working paper, July 18. Available at: www.law.stanford.edu/publications/resource-shuffling-and-the-californiacarbon-market.
- Ellerman AD, Buchner BK, and Carraro C (2007)

 Allocation in the European Emissions Trading
 Scheme: Rights, Rents and Fairness. Cambridge:
 Cambridge University Press.

- Ellerman AD, Joskow PL, Schmalensee R et al. (2000) Markets for Clean Air: The U.S. Acid Rain Program. Cambridge: Cambridge University Press.
- Joint Utilities Group (2012) IOUs proposed remedies for outstanding concerns regarding resource shuffling language in the ARB's cap-and-trade regulation. Presentation at a public meeting of the Emissions Market Assessment Committee, September 24. Available at: www.arb.ca.gov/cc/capandtrade/emissionsmarketassessment/iouresource-shuffling-proposal-09-24-12.pdf.
- Legislative Counsel of California (2014) California Health and Safety Code. Available at: www.leginfo. ca.gov/cgi-bin/calawquery? codesection=hsc.
- Los Angeles Department of Water and Power (LADWP) (2013) Board approval letter, LADWP Apex Power Project power sales agreement no. BP 13-055, November 26. Available at: http://clkrep.lacity.org/onlinedocs/2013/13-1635_rpt_bwp_12-4-13.pdf.
- Newell RG, Pizer WA and Raimi D (2014) Carbon market lessons and global policy outlook. Science, March 21. Available at: www.sciencemag.org/content/343/6177/1316.summary.
- Nichols MD (2014) California is showing how it can work. New York Times, June 1. Available at: www.nytimes.com/roomfordebate/2014/06/01/canthe-market-stave-off-global-warming/california-is-showing-how-cap-and-trade-can-work.
- Paulson HM (2014) The coming climate crash. New York Times, June 21. Available at: www.nytimes. com/2014/06/22/opinion/sunday/lessons-for-climate-change-in-the-2008-recession.html.
- Shultz GP and Becker GS (2013) Why we support a revenue-neutral carbon tax. Wall Street Journal,

- April 7. Available at: http://online.wsj.com/news/articles/SB100014241278873236116045783 96401965799658.
- Stavins RN (2014) The only feasible way of cutting emissions. New York Times, June 2. Available at: www.nytimes.com/roomfordebate/2014/06/01/can-the-market-stave-off-global-warming/cap-and-trade-is-the-only-feasible-way-of-cutting-emissions.
- Wara M (2014) California's energy and climate policy: A full plate, but perhaps not a full model. *Bulletin of the Atomic Scientists* 70(5). DOI: 10.1177/0096340214546832.

Author biography

Danny Cullenward is the inaugural Philomathia Research Fellow at the Berkeley Energy and Climate Institute (BECI) at the University of California, Berkeley, USA. An energy economist and lawyer by training, his work focuses on the design and implementation of science-based climate policy. Cullenward has been working on carbon markets for 10 years. In 2013, he represented climate scientists before the Ninth Circuit, successfully defending the constitutionality of California's climate policy. He holds a PhD in Environment & Resources (E-IPER) from Stanford University and a JD from Stanford Law School.

Appendix A – Comment Letters

Exhibit 3

 From:
 Chang, Edie@ARB

 To:
 Brent Newell

 Subject:
 RE: C&T Adaptive Management Plan

 Date:
 Wednesday, August 19, 2015 6:08:21 PM

Hi Brent — we don't release information about transactions within the C&T program because that information is considered market sensitive. There is information posted on our website about allowance allocation

(http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/v2015allocation.pdf) and auction participation (http://www.arb.ca.gov/cc/capandtrade/auction/may-

2015/summary_results_report.pdf and http://www.arb.ca.gov/cc/capandtrade/auction/may-2015/ca_proceeds_report.pdf .

As I mentioned in my note, we're going to starting some outreach in the fall on AM. We've haven't taken actions on adaptive management to date.

Thanks

Edie

From: Brent Newell [mailto:bnewell@crpe-ej.org] Sent: Tuesday, August 18, 2015 5:28 AM

To: Chang, Edie@ARB

Subject: RE: C&T Adaptive Management Plan

Edie,

Please send me information (1) on where facilities obtained their allowances/offsets for the 2013 compliance event; and (2) any actions ARB has taken pursuant to the Adaptive Management Plan in response to the 2013 compliance event.

Thanks!

PLEASE NOTE OUR NEW ADDRESS

BRENT NEWELL LEGAL DIRECTOR CENTER ON RACE, POVERTY & THE ENVIRONMENT 1999 HARRISON STREET, SUITE 650 OAKLAND, CA 9461, 0415,1346,4179 x304 (415) 346,4723 FAX BNEWELL® CRPE-EJ, ORG

"True peace is not merely the absence of tension; it is the presence of justice." – Dr. Martin Luther King



PROVIDING LEGAL AND TECHNICAL ASSISTANCE TO THE GRASSROOTS MOVEMENT FOR ENVIRONMENTAL JUSTICE



PRIVILEGE AND CONFIDENTIALITY NOTICE
THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS
ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED. CONFIDENTIAL AND EXEMPT
FROM DISCLOSURE UNDER APPLICABLE LAW AS ATTORNEY CLIENT AND WORK-PRODUCT
CONFIDENTIAL OR OTHERWISE CONFIDENTIAL COMMUNICATIONS. IF THE READER OF THIS
MESSAGE IS NOT THE INTENDED RECIPIENT. YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION,
DISTRIBUTION, OR COPYING OF THIS COMMUNICATION OR OTHER USE OF A TRANSMISSION
RECEIVED IN ERROR IS STRICTLY PROHIBITED.

From: Chang, Edie@ARB [mailto:edie.chang@arb.ca.gov]

Sent: Friday, August 14, 2015 10:26 AM

To: Brent Newell

Subject: RE: C&T Adaptive Management Plan

HI Brent - I've attached links to the cap and trade data that is available.

Reported and verified GHG emissions data is available here. The latest data posted is 2013. We will be posting the 2014 data in November. We've been collecting data under the reporting reg since 2008 and I think it's available on that website. http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm

We have had one compliance event so far - in November of 2014. At that time, entities were required to submit allowances to cover 30% of their 2013 emissions. This is the report from that compliance event. You can see how many compliance instruments (allowances and offset) each entity submitted and also what offsets were used. Our next compliance event is November 2015 at which time allowances to cover the remaining 70% of 2013 emissions and 100% of 2014 emissions will be due. We will post a similar report after that compliance event. http://www.arb.ca.gov/cc/capandtrade/2013compliancereport.xlsx

This is a report that shows the total compliance instruments that have been issued. http://www.arb.ca.gov/cc/capandtrade/complianceinstrumentreport.xlsx

We're continuing to work on our adaptive management plan and will be starting some outreach in the fall. Let me know if you have any questions, Edie

From: Brent Newell [mailto:bnewell@crpe-ej.org]
Sent: Thursday, August 13, 2015 3:39 PM

To: Chang, Edie@ARB

Subject: C&T Adaptive Management Plan

Edie,

I hope all is well. On the CAA 111(d) call in July you mentioned that ARB had analyzed cap and trade program data for 2013 as part of the Adaptive Management Plan. I would like to receive that data,

especially data that shows how each source met its compliance obligation (e.g. through surrendering allowances, buying offsets, etc.). I'd also like to receive source specific emissions data to understand how each source has increased or decreased its emissions under cap and trade.

Please advise.

Thanks, Brent

PLEASE NOTE OUR NEW ADDRESS

BRENT NEWELL
LEGAL DIRECTOR
CENTER ON RACE POVERTY & THE ENVIRONMENT
CENTER ON RACE POVERTY & THE ENVIRONMENT
1899 HARRISON STREET, SUITE 650
(AKLAND, CA 94612
(415) 3464179 X304
(415) 3468723 FAX
BNEWELL @CRPE-ELLORG
WWW.CRPE-ELLORG

"True peace is not merely the absence of tension; it is the presence of justice." – Dr. Martin Luther King



PROVIDING LEGAL AND TECHNICAL ASSISTANCE TO THE GRASSROOTS MOVEMENT FOR ENVIRONMENTAL JUSTICE



PRIVILEGE AND CONFIDENTIALITY NOTICE
THIS MESSAGE IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS
ADDRESSED AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED, CONFIDENTIAL AND EXEMPT
FROM DISCLOSURE UNDER APPLICABLE LAW AS ATTORNEY CLIENT AND WORK-PRODUCT
CONFIDENTIAL OR OTHERWISE CONFIDENTIAL COMMUNICATIONS, IF THE READER OF THIS
MESSAGE IS NOT THE INTENDED RECIPIENT. YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION,
DISTRIBUTION, OR COPYING OF THIS COMMUNICATION OR OTHER USE OF A TRANSMISSION
RECEIVED IN ERROR IS STRICTLY PROHIBITED.

Exhibit 4

Tracking and Evaluation of Benefits and Impacts of Greenhouse Gas Limits in Disadvantaged Communities: Initial Report

Office of Environmental Health Hazard Assessment

California Environmental Protection Agency

February 2017



Preface

This report has been prepared in response to a directive issued by Governor Brown for an analysis of the state's response to climate change under the Global Warming Solutions Act of 2006 (AB 32). Specifically, the directive calls for the Office of Environmental Health Hazard Assessment (OEHHA) to prepare a report analyzing the benefits and impacts of the greenhouse gas emissions limits adopted by the California Air Resources Board (ARB) within disadvantaged communities. OEHHA is to update the report at least every three years.

The state's climate policies (e.g., Cap-and-Trade, zero emissions vehicles, renewable energy, low carbon fuel standard) are reducing greenhouse gas emissions statewide as well as contributing to reductions in other pollutants. This report is the first step in an investigation of whether the design and implementation of these climate policies are facilitating decreases or increases in pollutants of concern in disadvantaged communities.

OEHHA's mission is to protect and enhance public health and the environment of California through the evaluation of risks posed by hazardous substances. To carry out that mission, OEHHA provides scientific assistance to the state's other environmental and health agencies on projects involving hazard identification, exposure and toxicity assessment, and health and ecological risk assessment. The mission of ARB is to promote and protect public health, welfare and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the state.

The focus of this initial report is on large stationary sources in the Cap-and-Trade Program, one of the elements of the state's climate change programs that is aimed at gradually reducing greenhouse gas emissions from large industrial sources through a market-based mechanism. It is limited in scope, but aims to be a starting point for future analyses. Later reports will also address the benefits and impacts of other AB 32 programs to reduce greenhouse gas emissions. The report does not explore the benefits associated with investments of Cap-and-Trade auction revenue. Subsequent reports will investigate impacts such as changes in toxic air contaminants emitted by mobile sources.

This report is one of several efforts by researchers and government entities to address airquality impacts on disadvantaged communities. Cushing *et al.* (2016) investigated the locations and pollution from large stationary sources of greenhouse gas emissions in California that are covered under the Cap-and-Trade Program. ARB continues to implement its adaptive management program to identify and track emissions increases, if any, that are attributable to implementing the Cap-and-Trade Program. AB 197 (Garcia, Statutes of 2016) directs ARB to prioritize programs to achieve direct emissions reductions from large stationary sources and

OEHHA -ii- January 2017

mobile sources. AB 197 also requires ARB to graphically display data on the emissions of greenhouse gases, criteria pollutants, and toxic air contaminants on its website. These efforts over time will improve our knowledge of how California's climate change programs and older, more established regulatory programs affect emissions levels of criteria and toxic pollutants, and improve our understanding of emissions changes attributable to actions taken pursuant to AB 32.

In summary, OEHHA's work here complements other efforts underway to understand potential impacts from the state's various programs to reduce greenhouse gas emissions. There are also efforts to increase access to information on stationary-source emissions for a range of pollutants. This information is expected to inform future proposals to require further reductions in emissions of criteria, toxic, and greenhouse gases from industrial sources.

Table of Contents

Pre	face
Exe	cutive Summaryvi
I	Introduction
П	Scope of Analysis
	Benefits and Impacts
	Disadvantaged Communities
	Greenhouse Gas Emissions Limits Adopted by the State Air Resources Board
	Initial Focus of AB 32 Impact and Benefit Analysis: Cap-and-Trade Program
	The Cap-and-Trade Program
Ш	Facilities Subject to the Cap-and-Trade Program: Description and Proximity to
	Disadvantaged Communities
	What Are the GHG Facilities?
	What Are the Sources of Emissions from GHG Facilities Covered by the Cap-and-Trade Program?
	Where Are GHG Facilities?
IV	Proposed Analytic Approach to Characterize Benefits and Impacts
	Key Questions
	Challenges in Evaluating the Benefits and Impacts of the Cap-and-Trade Program
	Practical Steps for Initial Analysis
V	Data Used to Characterize Emissions of GHG and Air Toxics Emissions from GHG
	Facilities
	Mandatory Reporting of Greenhouse Gas Emissions
	Air Toxics "Hot Spots" Emission Inventory
	Criteria Air Pollutant Emissions
	Toxic Release Inventory (TRI; US Environmental Protection Agency)
	General Limitations to the Use of Emissions Data as an Indicator of Benefits and Impacts 2
VI	Toxicity of GHGs and other Air Pollutants
	Greenhouse Gases
	Criteria Air Pollutants

OEHHA

-iv-

January 2017

Appendix A – Comment Letters

	Toxic Air Contaminants	26
VII	Results	27
	Toxicity-Weighted Emissions to Air	27
	Air Toxics and GHGs Emissions	33
	Criteria Air Pollutant and GHG Emissions	37
	Case Study: Cement Plants	40
	Case Study: Refineries	44
VIII	Discussion & Conclusions	48
	Future Data Collection and Analysis	49
App	endix A	A-1

List of Figures

Figure 1.	Communities Identified as "Disadvantaged" under SB 535 (in Red) Using CalEnviroScreen Version 2.0 Results (October 2014)	5
Figure 2.	California Map Showing the Locations of GHG Facilities and SB 535 Disadvantaged Communities	15
Figure 3.	Scatterplot of Toxicity-Weighted Emissions vs GHG Emissions from GHG Facilities with Emissions Data, by Cap-and-Trade Program Sectors (n=201)*	35
Figure 4.	Scatterplots of Toxicity-Weighted Emissions vs GHG Emissions (MTCO ₂ e) by Capand-Trade Program Sectors (plotted on logarithmic scale)	36
Figure 5.	Scatterplots of Criteria Air Pollutant Emissions from All GHG Facilities with Emissions Data for the 2014 Reporting Year (n \approx 316; Criteria Air Pollutant Emissions vs. GHG Emitter-Covered Emissions in MTCO $_2$ e).	38
Figure 6.	Location of Cement Plants Covered by the Cap-and-Trade Program	11
Figure 7.	Cement Plants: Emitter Covered Emissions of GHGs (MTCO2e, MRR Data) (Top), Toxicity-Weight Air Emissions (TRI Data) (Middle) and PM2.5 Emissions (in tons, CEIDARS Data) (Bottom) over the Years 2011-2014	13
Figure 8.	Location of Refineries Covered by the Cap-and-Trade Program	16
Figure 9.	Refineries: Emitter Covered Emissions of GHGs (MRR Data) (Top), Toxicity-Weighted Air Emissions (TRI Data) (Middle), and PM2.5 Emissions (CEIDARS Data) (Bottom) for 18 Refineries Over the Years 2011-2014.	17
	List of Tables	
Table 1.	AB 32-Related Programs and Initiatives to Reduce GHG Emissions	6
Table 2.	GHG Emissions in 2014 by Cap-and-Trade Program Industry Sector for Facilities Reporting Emissions (Emitter-Covered Emissions in MTCO₂e)	11
Table 3.	GHG- and Air Toxic-Generating Activities and Processes in Primary Sectors of GHG Facilities Covered by the Cap-and-Trade Program (based on 2014 Inventory of Facilities)	12
Table 4.	Analysis of Proximity of GHG Facilities to SB 535 Disadvantaged Communities (Based on Geocoding by Facility Street Addresses)	16
Table 5.	Partial List of Information Available from Mandatory Greenhouse Gas Emissions Reporting	20
Table 6.	Information Available in the Annual Compliance Report for the Cap-and-Trade Program (ARB)	21
Table 7.	Sources of Exposure and Health Effects of Criteria Air Pollutants	25

Appendix A – Comment Letters

Emissions by Cap-and-Trade Sector (Criteria Air Pollutants Excluded)
Table 9. Twenty-Five Cap-and-Trade Facilities with the Highest Toxicity-Weighted Air Emissions.* Shaded Facilities Are In or Within ½ Mile of an SB 535 Census Tract 32
Table 10. Correlation for GHG Emissions vs. Toxicity-Weighted Air Toxics Emissions for Cap- and-Trade Facility by Sector (2014 Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05)
Table 11. Correlations between Emitter Covered GHG Emissions (in MTCO ₂ e) and Criteria Air Pollutant Emissions (in pounds) for All Cap-and-Trade Facilities with Emissions Data (2014 Data)
Table 12. California Cement Plants Evaluated for GHG and Air Toxics Emissions
Table 13. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. Toxicity- Weighted Air Emissions (TRI Data) or PM2.5 Emissions (CEIDARS Data) for Eight Cement Plants44
Table 14. California Refineries Evaluated for GHG and Air Toxics Emissions. Shaded Rows Indicate Facilities within One-Half Mile of an SB 535 Disadvantaged Census Tract 45
Table 15. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. PM2.5 Emissions (CEIDARS Data) or Toxicity-Weighted Air Emissions (TRI Data) for Refineries*

Executive Summary

In the ten years since the enactment of the California Global Warming Solutions Act of 2006 (also known as AB 32), concerns have been expressed that the state's trailblazing efforts to reduce greenhouse gas (GHG) emissions may unintentionally impact low-income communities that are already burdened by pollution from multiple sources. More specifically, the concerns are that the state's GHG-reduction programs could prompt regulated businesses to make decisions resulting in more air pollution from facilities in those communities than would otherwise be the case even while statewide GHG emissions decrease.

Conversely, California's climate-change programs also offer the potential to benefit these low-income industrial communities, to the extent that the programs prompt investments by regulated businesses that reduce emissions of both GHGs and conventional air pollutants in the communities where they operate.

In December 2015, Governor Brown directed the Office of Environmental Health Hazard Assessment (OEHHA) to analyze possible benefits and impacts to communities identified as disadvantaged under SB 535 (De León, Chapter 830, Statutes of 2012) from the GHG-emissions limit adopted by the California Air Resources Board. These benefits and impacts include changes in emissions of GHGs, toxic air contaminants, and criteria air pollutants.

This is an initial report that provides the starting point for future, more comprehensive analyses of the impacts on disadvantaged communities of GHG-emission limits. As discussed below and in the body of the report, the emissions data available at this time do not allow for a conclusive analysis. This report makes some preliminary findings that OEHHA expects to build upon in future analyses as it acquires and evaluates more data. It does not provide definitive findings regarding the effects of the GHG limit on any individual community, or disadvantaged communities in general.

The focus of this first report is on one specific AB 32 program, the state's Cap-and-Trade Program. This program regulates facilities that produce a significant fraction of the state's GHG emissions, as well as toxic co-pollutants. There are adequate data available from the Cap-and-Trade Program to begin an evaluation of potential benefits and impacts from changes in emissions. Other GHG reduction programs will be covered in later report as more data related to these programs become available.

In time, the analysis of the Cap-and-Trade Program aims to address the following key questions:

 How do emissions of GHGs relate to emissions of toxic air contaminants and criteria air pollutants from the same facility?

OEHHA -viii- January 2017

- Are emissions disproportionately occurring in SB 535 disadvantaged communities? Do disadvantaged communities benefit from or are they negatively impacted by changes in GHG emissions from facilities subject to Cap-and-Trade?
- Are the benefits and impacts due to the design of the Cap-and-Trade Program?

While challenges described in this report preclude definitive answers to these questions, OEHHA's initial analysis in this report makes the following findings:

- 1. A disproportionate number of facilities subject to the Cap-and-Trade Program are located in SB 535 disadvantaged communities. The Cap-and-Trade Program covers several hundred facilities from different industrial sectors that are located across the state. Of the 281 facilities with street addresses that could be geocoded, more than half (57 percent) are located in or within one-half mile of an SB 535 disadvantaged community¹. More specifically, 15 of 20 refineries (75 percent), 5 of 7 hydrogen plants (71 percent) and 72 of the 110 facilities classified by ARB as "other combustion source" facilities (65 percent) are located in or within one-half mile of a disadvantaged community. While people's actual exposures to toxic co-pollutants emitted from these facilities would depend on various factors such as meteorological conditions and smokestack heights, changes in co-pollutant emissions resulting from the Cap-and-Trade Program would nonetheless tend to have disproportionate benefits (if emissions decrease) or adverse impacts (if emissions increase) on disadvantaged communities because of their proximity to these facilities.
- 2. There were moderate correlations between GHG emissions and the emissions of criteria air pollutants. The strongest correlation was with fine particulate matter emissions (PM2.5). There was also moderate correlation between GHG and toxic chemical emissions across the entire set of Cap-and-Trade facilities with covered emissions. Some individual industrial sectors showed greater correlations between emissions of GHGs and toxic co-pollutants. Refineries overall showed a strong correlation, while cement plants showed a moderate correlation. Oil and gas production facilities also showed a moderate correlation, depending on the statistical measure used. Facilities in certain sectors with broad ranges in emissions levels (e.g. electricity generation facilities) showed increased correlation with a specific statistical analysis (logarithmic transformation). This report only looked at emissions from one recent year (2014), however, because this was the only year for which air toxics data could be obtained in time for this analysis.

OEHHA -ix- January 2017

¹ Identified in 2014. More on the identification of these communities can be found on CalEPA's website at the following URL: http://calepa.ca.gov/EnvJustice/GHGInvest/.

- 3. OEHHA also conducted a more detailed case study of nine cement plants and 19 refineries. These facilities have relatively high toxicity-weighted emissions, and data for the years 2011-2014 were available. The different plants showed varying levels of correlation among GHG, toxicity-weighted emissions, and PM2.5 emissions during the four-year period. Several cement facilities showed modest positive correlations between GHG and toxicity-weighted emissions, while two cement facilities showed poorer correlations. For refineries, there generally was a positive correlation between GHG and toxicity-weighted air emissions. Facilities with high levels of GHG emissions generally had higher PM2.5 and toxicity-weighted emissions. There were some differences among individual refineries in the relationships between GHGs, toxicity-weighted and PM2.5 emissions, perhaps reflecting differences in the kinds of products made at each of the refineries.
- 4. These results indicate that the relationship between GHGs and other pollutant emissions is complex. GHG facilities that emit higher levels of GHGs tend to have higher emissions of toxic air contaminants and criteria air pollutants. There is a need for additional investigation into the factors that drive emission changes, how GHG emission reductions are likely to be achieved in different industrial sectors, and what that may mean for concomitant changes in emissions of toxic air pollutants. Nonetheless, these analyses suggest that reductions in greenhouse gas emissions are likely to result in lower pollutant exposures in disadvantaged communities, based overall on the positive correlations observed for the 2014 data.

Limited data availability prevented OEHHA from conducting a more comprehensive analysis in time for this report. The Cap-and-Trade Program is a relatively new program, with the first auction of emissions instruments occurring in 2012. In 2013-2014, the program covered large industrial sources and electricity generation. In 2015, the program expanded to cover emissions from combustion of gasoline and diesel, as well as natural gas use in commercial and residential applications. In these early days of the program, it is hard to discern trends and make firm conclusions regarding patterns of changes in GHG emissions resulting from the program.

Further, data are not yet available to broadly cover emissions of toxic air pollutants from all facilities subject to the Cap-and-Trade Program. Data on emissions of GHGs, criteria air pollutants and toxic air pollutants are collected by multiple entities under different programs and statutory mandates. To date, there is no co-reporting of GHG and toxic emissions, and differences in reporting requirements across regulatory programs complicates data analysis. OEHHA will continue to acquire and analyze data for future reports, which will build upon the initial findings presented in this report.

OEHHA -x- January 2017

In addition, toxic emissions data for many facilities are only updated every four years, further limiting conclusions that can be reached. OEHHA currently only has a limited set of data to examine changes in emissions that would illuminate statewide patterns, especially with respect to disadvantaged communities. A further complexity for the analysis is that the relationships between GHG and co-pollutant emissions vary across different industrial sectors (and even within facilities within a sector) with the differences in fuel types and sources, industrial processes and chemical feedstocks.

Therefore, at this point in time, when the program is still new, OEHHA cannot make definitive conclusions regarding changes in emissions due to the Cap-and-Trade Program that may disproportionately affect disadvantaged communities. OEHHA expects with time the picture will become clearer. As the program continues to generate data over the next several years, it will be easier to detect and evaluate emissions trends. OEHHA intends to update the analysis in subsequent reports as additional types of data and years of data emerge. Co-reporting of high quality data on criteria, air-toxic and GHG emissions for the facilities subject to the Cap-and-Trade Program would substantially aid the investigation of emissions impacts.

In future reports, OEHHA also plans to expand the analysis to cover AB 32 programs in addition to the Cap-and-Trade Program. It will be important to evaluate the Cap-and-Trade Program in concert with other climate policies to gauge how the entire climate change program in aggregate may impact or benefit individual disadvantaged communities and as a whole. Examination of emissions changes in the transportation sector resulting from the large and varied AB 32 programs affecting it will be an important part of this more comprehensive evaluation.

OEHHA -xi- January 2017

Introduction

In the ten years since the enactment of the California Global Warming Solutions Act of 2006 (also known as AB 32), concerns have been expressed that the state's trailblazing efforts to reduce greenhouse gas (GHG) emissions may unintentionally impact low-income communities that are already burdened by pollution from multiple sources. A concern is that the state's GHG-reduction programs could prompt regulated businesses to make decisions resulting in higher emissions of conventional air pollutants at facilities in those communities than would otherwise be the case even while statewide GHG emissions decrease.

Conversely, California's climate-change programs also offer the potential to benefit these low-income industrial communities, to the extent that the programs prompt investments by regulated businesses that reduce emissions of both GHGs and conventional air pollutants in the communities where they operate.

In December 2015, Governor Brown directed the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) to analyze and periodically report on the impacts and benefits on disadvantaged communities related to the state's emission controls to mitigate climate change:

"I am directing that the Office of Environmental Health Hazard Assessment (OEHHA) prepare by December 1, 2016, a report analyzing the benefits and impacts of the greenhouse gas emissions limits adopted by the State Air Resources Board pursuant to Division 25.5 (commencing with Section 38500) of the Health and Safety Code within disadvantaged communities described in Health and Safety Code Section 39711. The report shall be made available to the public and the Legislature. OEHHA shall update the report at least every three years.

The report, at a minimum, shall track and evaluate (a) greenhouse gas emissions, criteria air pollutants, toxic air contaminants, short-lived climate pollutants, and other pollutant emission levels in disadvantaged communities; and (b) public health and other environmental health exposure indicators related to air pollutants in disadvantaged communities."

This report is the initial response to this directive. OEHHA has examined readily available information to evaluate possible analytical approaches, and has conducted an initial analysis of one major activity to reduce greenhouse gas (GHG) emissions – the Cap-and-Trade Program. The California Air Resources Board (ARB) established this program in regulation² pursuant to

OEHHA -1- January 2017

² Originally adopted in 2011. The current Cap-and-Trade regulation can be found at the following URL: https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

Health and Safety Code Section 38500 enacted by Assembly Bill (AB) 32 (Núñez, Statutes of 2006), also known as the Global Warming Solutions Act of 2006).

Under the Cap-and-Trade Program, ARB applies a statewide cap on GHG emissions from a number of entities that are responsible for emissions of GHGs. The covered entities represent a variety of industrial sectors. These include electricity generators, food processors, other industrial facilities that burn large quantities of fossil fuels, as well as mobile sources. Facilities are required to surrender state-issued emission allowances and emission offset credits equal to their reported and verified GHG emissions. Over time, the aggregate cap (the total amount of GHG emissions allowed from all covered facilities declines). The regulation provides flexibility in how covered GHG emitters may comply with the overall emissions cap, allowing them to seek the least costly options. Reductions of GHGs may have the added benefit of reducing emissions of toxic air contaminants, ozone-producing gases and criteria air pollutants. The varied distribution on where facilities are located across California and the flexibility of the program can mean that changes in emissions of GHGs do not occur evenly across communities.

A variety of factors in addition to the Cap-and-Trade Program can affect the amount of GHG emitted by a facility including regional or global economic trends and consumer demand, drought, facility shutdowns (e.g., the shutdown of the San Onofre Generating Station) and responses to other policies (e.g., the renewable portfolio standard for electricity generation).

While this initial report focuses on the Cap-and-Trade Program, future reports will also include assessment of other GHG emission reductions programs set in place to meet AB 32 requirements. Some of these other programs are expected to significantly benefit and possibly impact communities' exposures to co-pollutants. These analyses should prove useful for informing future decisions by the state's climate change programs, including mitigating unintended impacts and maximizing benefits from reductions of co-pollutant emissions in disadvantaged communities. However, the Cap-and-Trade Program is still relatively new, with the first auction of emissions instruments occurring in 2013. In these early days of the program, it is hard to discern trends and make firm conclusions regarding patterns of emissions resulting from the program.

This report also highlights the need for data collection practices that would be helpful in enabling ongoing tracking of changes that may be occurring across California communities from the state's efforts to address climate change.

Finally, as described later in this report, GHG, criteria and air-toxic emissions are regulated under different programs. ARB regulates GHG emissions pursuant to AB 32, while local air districts regulate criteria and air-toxic emissions from facilities through their permitting processes. Each of these programs can affect emissions levels of these three classes of

OEHHA -2- January 2017

pollutants, and make evaluation of emissions of air toxic contaminants and criteria air pollutants that are attributable to the cap-and-trade program challenging.

Scope of Analysis

This report is directed at the question of whether certain communities, especially disadvantaged communities, are positively or negatively impacted from changes in exposures to environmental pollutants as a result of regulatory responses to the statewide GHG emissions limit adopted pursuant to AB 32. The scope of the analysis is necessarily limited in this initial report because of the limited data currently available, and the relatively short period of time since the implementation of the Cap-and-Trade Program. This section describes some methods that will be used to characterize benefits and impacts of the GHG reduction program, the definition of disadvantaged communities for the analysis, and the GHG reduction program of initial focus.

Benefits and Impacts

For this report, "benefits and impacts" are changes in pollutant exposures in communities resulting from changes in response to the Cap-and-Trade Program. The directive requires that the report, at a minimum, track and evaluate "greenhouse gas emissions, criteria air pollutants, toxic air contaminants, short-lived climate pollutants, and other pollutant emission levels" in disadvantaged communities, and also track and evaluate "public health and other environmental health exposure indicators related to air pollutants" in disadvantaged communities. This report provides information on levels of GHG emissions in communities, while using indicators of levels of criteria air pollutants, toxic air contaminants and other pollutants. Later reports will also identify and track public and environmental exposures indicators as measures of benefits and impacts, and will examine the effects of other GHG reduction programs in addition to the Cap-and-Trade Program. For example, the transportation sector, which is the largest source of GHG, criteria pollutant, and toxic emissions, will be addressed in later reports.

For this first report, we investigate the following emissions in communities:

- Greenhouse gases, including non-CO₂ compounds with global warming potential
- · Criteria air pollutants
- Toxic air contaminants

Disadvantaged Communities

The directive requires that benefits and impacts be analyzed within "disadvantaged communities" as described in H&SC Section 39711, established by Senate Bill (SB) 535 in 2012. SB 535 requires the California Environmental Protection Agency (CalEPA) to identify

OEHHA -3- January 2017

disadvantaged communities for investment of Cap-and-Trade proceeds. These communities are to be identified based on geographic, socioeconomic, public health and environmental hazard criteria, and may include, but are not limited to, either of the following:

- (1) Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation.
- (2) Areas with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment.

In October 2014, following a series of public workshops to gather public input, CalEPA released its list of disadvantaged communities for the purpose of SB 535. CalEPA based its list on the most disadvantaged communities identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), a tool developed by OEHHA that assesses all census tracts in California to identify areas disproportionately burdened by and vulnerable to multiple sources of pollution.

The analyses described and presented here focus on those California communities (census tracts) identified in 2014 by CalEPA as disadvantaged using Version 2.0 of the CalEnviroScreen tool.³ These communities are the highest-scoring census tracts in the state using the results of the tool, and represent about 25% of the state's population (see Figure 1 below).

OEHHA -4- January 2017

³ Information on the specific communities/census tracts identified as "disadvantaged" for purposes of SB 535 can be found on CalEPA's website at the following URL: http://calepa.ca.gov/EnvJustice/GHGInvest/.

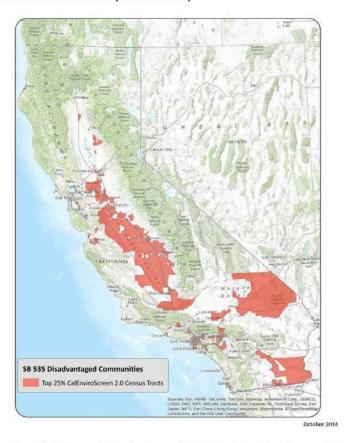


Figure 1. Communities Identified as "Disadvantaged" under SB 535 (in Red) Using CalEnviroScreen Version 2.0 Results (October 2014).

OEHHA updated its statewide analysis of communities with the public release of Version 3.0 of CalEnviroScreen in January 2017. Later in the year CalEPA will make a new identification of "disadvantaged communities" that is expected to rely at least in part on the CalEnviroScreen 3.0 results. Since that new designation has yet to be made, this evaluation of the Cap-and-Trade Program utilizes CalEPA's 2014 designation of disadvantaged communities.

Greenhouse Gas Emissions Limits Adopted by the State Air Resources Board

The directive specifically calls for OEHHA to analyze the benefits and impacts of the greenhouse gas emissions limits adopted by ARB pursuant to AB 32.

OEHHA -5- January 2017

AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. This has been estimated to require a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario. More recently, Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016) requires ARB to ensure that GHG emissions are reduced to at least 40 percent below the 1990 statewide GHG emissions limit no later than December 31, 2030.

AB 32 requires ARB and other state agencies to adopt regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. The goals of AB 32 are also being accomplished through a combination of policies, planning, direct regulations, market approaches, incentives, and voluntary efforts. The full implementation of AB 32 and SB 32 is expected to improve energy efficiency, expand the use of renewable energy resources, and result in cleaner transportation and reduced waste.

ARB's Climate Change Scoping Plan, which is required to be updated at least once every five years, describes its strategy for meeting the GHG limits. Its 2014 *Update* described the status of the various measures to reduce GHG emissions.⁴ Table 1 below shows a number of the programs that are in place or under development.

Table 1. AB 32-Related Programs and Initiatives to Reduce GHG Emissions.

Economic Activity	Program	
Large Industry, Electricity Generators, Fuel Distributors	Cap-and-Trade Regulation Energy Efficiency and Co-Benefits Audits for Large Industrial Sectors	
Transportation	 Advanced Clean Cars Low Carbon Fuel Standard Regional Transportation-Related Greenhouse Gas Targets Vehicle Efficiency Measures Ship Electrification at Ports Cap-and-Trade 	 Goods Movement Efficiency Measures Heavy-Duty Vehicle Emission Reduction Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Project High Speed Rail
Electricity and Natural Gas Use	Building Energy Efficiency Appliance Energy Efficiency Utility Energy Efficiency Solar Water Heating Combined Heat and Power Systems	 33 Percent Renewable Portfolio Standard Senate Bill 1, Million Solar Roofs Cap-and-Trade

⁴ The 2014 First Update to the AB 32 Scoping Plan, including Appendix B, can be found at the following URL: https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm.

OEHHA -6- January 2017

Economic Activity	Program	
Water Production, Distribution, and Use	Water Use Efficiency Water Recycling Water System Energy Efficiency	Reuse Urban Runoff Renewable Energy Production
Green Buildings	State Green Building Initiative Green Building Standards Code	 "Beyond Code: Voluntary Programs at the Local Level" Greening Existing Buildings
Oil and Gas Extraction, Distribution, and Refining	 Oil and Gas Extraction GHG Emission Reduction GHG Emissions Reduction from Natural Gas Transmission and Distribution Cap-and-Trade 	 Refinery Flare Recovery Process measures, consultation with air districts on amendments to rules for existing leak detection and repair at industrial facilities, including methane leaks
Recycling and Waste Management	Landfill Methane Control Measure Increase the Efficiency of Landfill Methane Capture Mandatory Commercial Recycling	 Increase Production and Markets for Compost and Other Organics, Anaerobic/Aerobic Digestion Extended Producer Responsibility Environmentally Preferable Purchasing
Forestry	Sustainable Forest Target	
Controls on High Global Warming Potential Gases	Motor Vehicle Air-Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing SF ₆ Limits in Non-Utility and Non-Semiconductor Applications Reduction of Perfluorocarbons in Semiconductor Manufacturing	 Limit Use of Compounds with High Global Warming Potentials in Consumer Products Stationary Equipment Refrigerant Management Program SF₆ Lead Reduction Gas Insulated Switchgear

Initial Focus of AB 32 Impact and Benefit Analysis: Cap-and-Trade Program

Many of the AB 32-related GHG emission reduction programs should carry the benefit of reduced exposures to co-pollutants in affected neighborhoods. For example, energy efficiency in electrical power generation and other sectors brings reduced releases of combustion by-products; reduced gasoline use from vehicle efficiency brings lower exposure to a number of gasoline-related toxicants; and improved control of fugitive emissions from natural gas transmission and distribution can reduce benzene releases.

The breadth of activities being undertaken to reduce GHG emissions in California makes a full analysis in this first report of the overall AB 32 program infeasible given the one-year timeframe for conducting the analysis. OEHHA is therefore placing an initial focus on California's Cap-and-Trade Program. This program has been chosen as the initial focus for the following reasons:

OEHHA -7- January 2017

- GHG emissions from facilities and sources that are regulated under the Cap-and-Trade Program constitute about 85 percent of the state's GHG emissions.⁵
- Facilities regulated under the Cap-and-Trade Program commonly emit toxic air
 pollutants in addition to GHGs, and the emissions of GHGs may correlate with toxic copollutants. Thus reductions or increases in GHGs may be accompanied by corresponding
 changes in toxicant emissions.
- Many of the facilities are also located in low-income communities with high non-white populations. An evaluation of this program is consistent with the directive's intent to examine impacts in disadvantaged communities.
- Substantial data describing emissions of GHGs and toxic air contaminants by the covered entities are available.

This initial analysis will become part of a larger ongoing effort to understand the co-benefits and impacts of California's GHG reduction programs. In future reports, OEHHA plans to expand the analysis to cover AB 32 programs in addition to the Cap-and-Trade Program.

The Cap-and-Trade Program

Upon initial implementation in 2012, the Cap-and-Trade Program covered large industrial facilities and electricity generators each annually emitting more than 25,000 metric tons of carbon dioxide equivalent (MTCO₂e).⁶ Distributors of transportation, natural gas, and other fuels were added to the program beginning in 2015. Presently the program covers about 450 entities.

Facilities in industrial sectors are annually allocated some free allowances to emit a portion of their GHG emissions. An allowance is a tradable permit to emit one metric ton of a CO₂-equivalent greenhouse gas emission (one MTCO₂e). Each allowance has a unique serial number to enable its tracking. The initial allocation of allowances for most industrial sectors was set at about 90 percent of average emissions, and was based on benchmarks that reward efficient facilities.⁷ A facility's allocation is generally based on its production levels and is updated annually. Utilities that distribute electricity and natural gas are given free allowances whose

OEHHA -8- January 2017

⁵ Overview of ARB Emissions Trading Program available at URL: https://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf.

⁶ Carbon dioxide (CO₂) is the primary GHG, but other chemical emissions have global warming potential, including methane (CH₄), black carbon, nitrous oxide (N₂O), and hydrofluorocarbons. Emissions of GHGs are reported as CO₂ equivalents, where emissions rates for GHGs other than CO₂ are adjusted by a multiplier. For example, the multipliers for methane and nitrous oxide are 21 and 310, respectively, indicating higher global warming potential on a mass basis (CO₂ = 1).

⁷ Overview of ARB Emissions Trading Program. Available at URL: https://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf.

value must be used to benefit ratepayers and reduce GHG emissions. Electrical distribution utilities also receive an allocation of about 90 percent of average emissions. The allocation for natural gas utilities is based on 2011 levels of natural gas supplied to non-covered entities.

The Cap-and-Trade Program regulations enable trading and limited banking of allowances, as well as obtaining a limited number of "offset" credits. An offset credit is equivalent to a reduction or increase in the removal of one MTCO₂e. Offset projects are developed by third parties and have included projects to remove CO₂ from the atmosphere through forestry projects, control of livestock-related biogas emissions, and projects to reduce use of refrigerants. These projects may occur out-of-state.

Allowances and offset credits are together referred to as "compliance instruments." Regulated entities surrender compliance instruments equivalent to their total GHG emissions by established deadlines within specific compliance periods. Compliance instruments can be obtained from the entity's free allocation, purchase of allowances at auctions or reserve sales, purchase of offset credits, and transfer of allowances or offset credits between entities. Use of offset credits is limited to up to eight percent of a facility's compliance obligation. Every year, covered entities turn in allowances and offsets for at least 30 percent of previous year's emissions. 9

Under the program, the annual emissions budgets decline 2-3% annually, but emissions in any year can fluctuate somewhat due to banking of allowances and offsets. The "cap" is the sum of the emissions allowances plus the allowable offset in aggregate for the compliance period.

California's program is designed to be linked to other similar programs outside of the state. This linkage allows covered California entities to use compliance instruments from GHG trading systems outside of California (and vice versa). This linkage creates a larger program and increases the total emission reduction achieved. Since 2014, the state's program has been linked to the program in Québec, Canada.

The first auction of allowances occurred in November 2012. Compliance obligation began in January 2013. In 2015, the compliance obligation began for distributors of transportation fuels, natural gas, and other fuels.

OEHHA -9- January 2017

⁸ The first compliance period was the years 2013 and 2014; the second and third compliance periods are 2015-2017 and 2018-2020, respectively.

⁹ At the end of the compliance period, covered facilities must surrender all instruments to cover the remaining emissions, that is 100% of final year and 70% of earlier years.

Facilities Subject to the Cap-and-Trade Program: Description and Proximity to Disadvantaged Communities

What Are the GHG Facilities?

The Cap-and-Trade Program has required compliance by sources of GHGs that emit more than 25,000 MTCO₂e per year since it began in 2012. These include facilities associated with electricity generation as well as large stationary sources of GHG emissions. Based on industrial classification, ARB has grouped the facilities into broad sectors for reporting purposes. These are: cement plants, cogeneration facilities, electricity generators, hydrogen plants, oil and gas production facilities, refineries, and "other combustion sources."

For the initial analysis here, OEHHA will continue to use these broad sectors to characterize possible differences in emissions of GHGs and air toxics.

In 2015, the Cap-and-Trade Program incorporated fuel suppliers. These are suppliers of petroleum products (including gasoline and diesel fuel), biomass-derived transportation fuels, natural gas (including operators of interstate and intrastate pipelines), liquefied natural gas, and liquefied petroleum gas. These entities are not included in the current analysis, in part because of how recently they have been included, but also because the emissions of GHGs and air toxics from these entities are distributed too widely to be included in the facility-based analysis conducted for this report. (However, refineries are a point source of emissions and the facility emissions resulting from the production of fuels are included in the analysis.) The current analysis focuses on facilities that produce more localized emissions. Furthermore, the sector representing electricity importers was also excluded from the present analysis.

Table 2 below shows industrial sectors included in the Cap-and-Trade Program, and the amount of GHGs emitted in 2014. ¹⁰ The largest contributors are from electricity generation and petroleum and gas refining, which together account for over half of the localized GHG generation covered by the Program (emitter covered emissions). On a facility basis, refineries also dominate, with average facility levels of 1.7 million MTCO₂e. However, within all but one sector, there is at least one facility producing more than 1 million MTCO₂e.

OEHHA -10- January 2017

¹⁰ Data available pursuant to California's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions at URL: https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

Table 2. GHG Emissions in 2014 by Cap-and-Trade Program Industry Sector for Facilities Reporting Emissions (Emitter-Covered Emissions in MTCO₂e).

Sector	No. Facilities / Entities	Total MTCO ₂ e by Sector	Range of MTCO₂e per Facility	Median MTCO₂e per Facility	Mean MTCO ₂ e per Facility
Cement Plant	9	7,653,163	123 – 1,968,656	935,061	850,351
Cogeneration	48	10,510,133	14,515 – 1,397,718	118,818	218,961
Electricity Generation	81	34,523,656	16 – 2,501,899	133,550	426,218
Hydrogen Plant	7	3,291,235	38,815 – 839,224	615,058	470,176
Oil and Gas Production ^a	50	16,256,368	13,155 – 3,246,254	44,572	325,127
Refinery ^b	18	31,266,353	3 – 6,363,590	1,112,508	1,737,020
Other Combustion Source ^c	116	8,326,559	747 – 1,412,648	44,534	71,781
Total	329	111,827,467			

^a Includes eight facilities that also supply natural gas, natural gas liquids, or liquefied petroleum gas.

What Are the Sources of Emissions from GHG Facilities Covered by the Cap-and-Trade Program?

The Cap-and-Trade Program covers several hundred industrial facilities that represent a wide variety of processes and activities. As a result of these activities, GHGs as well as other pollutants are commonly released into the atmosphere.

Table 3 below describes the facility sectors that report GHG emissions under the Cap-and-Trade Program and some of the processes used within these sectors that generate both GHGs and emissions of air toxics. In most sectors, the combustion of fuel is an important contributor to both GHG and air toxics emissions. For some sectors, GHGs are generated from processes other than fuel combustion (for example, CO₂ generated from the production of clinker in the manufacture of cement or CO₂ released from the production of hydrogen gas in the steam reformation process). Nearly all processes also generate air toxics. Criteria air pollutants and toxic air contaminants can be generated by non-combustion processes that may not be related to GHG emissions.

OEHHA -11- January 2017

b Includes 15 facilities that also supply transportation fuel or CO2, and/or operate a hydrogen plant.

c Includes one facility that also supplies CO2.

Table 3. GHG- and Air Toxic-Generating Activities and Processes in Primary Sectors of GHG Facilities Covered by the Cap-and-Trade Program (based on 2014 Inventory of Facilities).

Sector	Activities	Processes	Main Processes Generating CO₂e and Air Toxics
Cement Plants	Production of cement from limestone, clay and sand.	The mixture of limestone, clay, and sand is heated at high temperatures in a kiln to form clinker. Clinker is cooled and ground with various additives to produce cement. Key steps: 1. Raw materials acquisition and handling 2. Kiln feed preparation 3. Pyro-processing (calcining) 4. Finished cement grinding Most cement plants use short kilns with preheaters and pre-calciners for pyro-processing in clinker production. Some use long dry kilns without preheaters.	Pyro-processing (calcining) Fuel combustion (frequently coal)
Cogeneration Facilities	Generation of electrical power and useful heat, including waste heat recovery, from the same original fuel energy. Also known as combined heat and power.	Electricity and thermal energy are generated onsite at cogeneration facilities, where waste heat recovery also occurs. Some examples of cogeneration include: 1. Gas or other fuel combustion, sometimes to heat water to produce steam. 2. Gas or steam turbine to generate electricity 3. Exhaust energy convert to steam, exported to a host facility	Fuel combustion (fossil fuels or biomass)
Electricity Generation Facilities	Generating electrical power	Gas turbine: fuel combustion to generate electricity Boiler: to capture exhaust heat to make steam Steam turbine: to produce additional electricity	Fuel combustion (fossil fuels or biomass) Fugitive emissions
Hydrogen Plants	Producing hydrogen from feedstock for refineries, food industries, and fertilizer production	Steam methane reforming (SMR) method (for example): 1. Feedstock hydrogenation and sulfur removal 2. Reforming in the SMR 3. Shift conversion 4. Hydrogen purification	Fuel combustion Feedstock consumption ¹¹ All steps

OEHHA -12- January 2017

¹¹ Produces mainly CO₂.

Sector	Activities	Processes	Main Processes Generating CO₂e and Air Toxics
Oil and Gas Production Facilities	Extraction of crude petroleum and natural gas from geological formations. May include well stimulation such as thermal (steam), waterflood, or gas injection techniques	1. Extraction of oil/water emulsion from the geological formation via a mechanical or submergible pump 2. Separation of emulsion into water, oil, and gas 3. Storage and transfer or oil and water; processing of natural gas for sale or use	Fuel combustion (frequently natural gas for steam generation) Fugitive emissions Flaring Dehydration processes
Refineries	Production of petroleum products, including transportation fuels (gasoline diesel), asphalt, and other products (kerosene, liquefied petroleum gas, feedstock for production of other materials)	Refineries can vary in the complexity of their processes. Topping refineries have small throughput, primarily separating crude oil into intermediates or simple products (e.g., asphalt). Hydro-skimming facilities include reforming and desulfurization process units as well as topping activity. More complex facilities produce transportation fuels and other products, and tend to use more energy, using processes including distillation, reforming, hydrocracking, catalytic cracking, coking, alkylation, blending, isomerization, amine treating, mercaptan oxidation. Many refineries have on-site hydrogen production, calciners, and sulfuric acid plants. Heavy crude oil inputs and production of lighter/cleaner products require more energy.	Combustion of refinery gas, syngas, and petroleum coke Fuel combustion for distillation Hydro-treating Catalytic reforming Sulfur removal Hydrogen generation
Other Combustion Sources	Multiple	Numerous industries are represented by facilities identified under the "other combustion source" sector. Facilities include those that manufacture nitrogenous fertilizer, alcoholic beverages, food and dairy products, paper and paperboard, gypsum products, soda ash, glass and glass containers, milling of iron and steel and rolled steel shapes, forging, lime, and mineral wool. Industrial activities can include canning, secondary smelting, and poultry processing. GHG emissions from colleges, universities, and professional schools are also included in this category.	Industry-dependent

OEHHA -13- January 2017

Where Are GHG Facilities?

OEHHA has analyzed the location of 281 GHG facilities covered by the Cap-and-Trade Program for which street addresses could be geocoded from a 2014 inventory of facilities ¹². In this case, the distance from each GHG facility to the nearest SB 535 disadvantaged community was evaluated. Facilities were grouped by industrial sector to determine whether some sectors were more likely to be in or near disadvantaged communities. Facility locations are shown in Figure 2 below. The analysis of the percent of each sector's facilities in or within specific distances of disadvantaged communities is presented in Table 4 below. Since disadvantaged communities represent 25% of the census tracts in the state, Table 4 shows that GHG facilities are disproportionately located within disadvantaged communities for all sectors. Over 50% of facilities for all but the cogeneration sector fall within one-half mile of a disadvantaged community.

OEHHA -14- January 2017

¹² Because oil and gas production facilities can cover large geographic areas, the proximity analysis to disadvantaged communities will require more in-depth spatial analysis. For this reason, 48 oil and gas production facilities with geocoded street addresses are not included in this analysis.

GHG Facilities and SB 535 Disadvantaged **Communities** Cement Plant Cogeneration Hydrogen Plant In-State Electricity Generation Refinery Oil and Gas Production Other Combustion Source SB 535 Disadvantaged Communities 50 100 Census Tracts San Francisco Area San Joaquin Valley Greater Los Angeles Area San Diego Area

Figure 2. California Map Showing the Locations of GHG Facilities and SB 535 Disadvantaged Communities.

OEHHA -15- January 2017

Table 4. Analysis of Proximity of GHG Facilities to SB 535 Disadvantaged Communities (Based on Geocoding by Facility Street Addresses).

	No.	% of Facili	ties in or near SB 5	535 DACs ^a
Sector	Facilities	Within	<0.5 mi	<1.0 mi
Cement Plant	9	33	56	56
Cogeneration	59	29	41	42
Electricity Generation	76	41	51	58
Hydrogen Plant	7	43	71	86
Refinery	20	65	75	85
Other Combustion Source	110	56	65	66
Total	281	46	57	60

^o The SB 535 disadvantaged communities include about 15.5% of California's land area. With the additional 0.5 and 1.0 mile buffers, the land area represents 16.9 and 18.1% of California's land area, respectively. The total land area in California is estimated at 155,779 square miles. Greater buffer distances represent cumulative percent of facilities within a given distance. Facilities are treated here as points. Since many facilities cover large areas (footprint), the proximity to disadvantaged communities may be underestimated in this analysis.

In total, 46 percent of the GHG facilities covered by the Cap-and-Trade Program were located within SB 535 disadvantaged communities, 57 percent were in or within 0.5 miles of one, and 60 percent were in or within one mile of an SB 535 community. Generally, the sectors with the greatest likelihood of having a facility in or near an SB 535 disadvantaged community were from the sectors for refineries, hydrogen plants, and "other combustion source" sectors. Since the majority of GHG facilities are in close proximity to SB 535 disadvantaged communities, changes in emissions generally represent potential for differential increases or decreases in exposure in these communities.

These results are consistent with a recent report from academic researchers that examined the locations of many of the GHG facilities covered under the Cap-and-Trade Program. Cushing *et al.* (2016)¹³ describe a geographic analysis of 321 facilities that reported GHG emissions that were covered by the Cap-and-Trade Program during the 2013-2014 compliance period. And of these, 255 were within 2.5 miles of a resident population. Areas in proximity to these facilities

OEHHA -16- January 2017

¹³ Cushing LJ, Wander M, Morello-Frosch R, Pastor M, Zhu A, Sadd J (2016). A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program. Research Brief – September 2016. UC, Berkeley, University of Southern California, San Francisco State University, and Occidental College. Available at URL: https://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade.

were examined with respect to CalEnviroScreen 2.0 scores (highest 10 and 20% of scores) as well as the percentages of people of color and living in poverty.

The analysis found that census block groups within 2.5 miles of the GHG facilities had higher mean non-white populations, higher mean poverty levels, and a higher likelihood of being in a high-scoring CalEnviroScreen 2.0 census tract compared to block groups farther from GHG facilities. Many block groups are also within 2.5 miles of more than one facility. As the number of facilities near block groups increases, communities tend to have higher populations of color and higher rates of poverty.

IV Proposed Analytic Approach to Characterize Benefits and Impacts

Key Questions

The overall analysis of Cap-and-Trade facilities aims to answer the following key questions, in due course:

- How do emissions of GHGs relate to emissions of toxic air contaminants and criteria air
 pollutants from the same GHG facilities? Since the Cap-and-Trade Program aims to
 reduce aggregate GHG emissions, understanding how reductions or increases in GHG
 emissions may relate to changes in emissions of toxic air pollutants that could result in
 human exposure is critical to analyzing potential benefits and impacts.
- Are emissions disproportionately occurring in SB 535 disadvantaged communities? Do
 disadvantaged communities benefit from or are they negatively impacted by changes in
 emissions from GHG facilities subject to Cap-and-Trade? The SB 535 communities face
 burdens from multiple sources of pollution and population vulnerability factors. Equity
 analyses will address whether changes are occurring that may disproportionately affect
 these communities.
- Are the benefits and impacts due to the design of the Cap-and-Trade Program? The
 directive seeks to analyze benefits and impacts attributable to the AB 32 program.
 Therefore, an ultimate goal of the analyses will be to understand what changes in
 emissions can be attributed to responses to the program rather than external factors,
 such as economic conditions and drought.

Challenges in Evaluating the Benefits and Impacts of the Cap-and-Trade Program

The ability to examine relationships between Cap-and-Trade Program activities, outputs, and outcomes/impacts is complicated by a number of factors. These include:

The diversity of industries and facilities covered by the program. Uniformity is not
expected in how industries are able or likely to achieve compliance with the Cap-and-

OEHHA -17- January 2017

Trade Program. The types and amounts of GHG and air toxics emissions that result from changes in industrial activities to comply with Cap-and-Trade are also expected to vary. Thus, the relationships between GHG and co-pollutant emissions vary across different industrial sectors (and even within facilities within a sector) with the differences in fuel types and sources, industrial processes and chemical feedstocks. For example, certain industrial processes may require fuels that burn at high temperatures. The emissions profile (specific chemicals emitted and levels at which they are emitted) typically varies with the temperature of combustion. Alternative fuels can also have different emissions profiles from conventional fuels.

• The limited availability of data about GHG program activities, associated emissions, and health and other outcomes. Some information regarding program activities is limited due to the need to protect confidential business information and market sensitivity of the information. This information could inform analyses of the relationship between GHG and co-pollutant emissions and facilities. Possible examples of such information include the mix and quantity of products made at specific facilities, and emissions produced per unit of product manufactured at a facility. However, such information may potentially provide economic advantage to competitors if made publicly available.

Other limitations in data are that information relevant to the analysis of outcomes — especially co-pollutants — has not to date been required to be co-reported with GHG emissions. As a result, these data must be obtained from sources resulting from other federal, state and local regulatory programs, such as permitting and reporting requirements and emissions monitoring by local air districts. Differences in reporting requirements across regulatory programs can complicate the analysis. Optimally, this analysis would have data reporting for co-pollutants and GHG emissions within the same time period, and over time. Changes in data collection practices can make it difficult to establish relationships between activities and outcomes over time.

- The flexibility of the Cap-and-Trade Program. The program has a number of
 components, including the aggregated nature of the GHG emissions cap and provisions
 to minimize "leakage" in which economic/industrial activity may move out of state.
 Facilities are also provided with numerous options for how compliance can be achieved,
 including "banking" of compliance instruments to provide flexibility while the program
 overall still meets the goals of GHG emission reductions. Also, the phase-in of different
 industrial sectors has occurred in different years.
- Confounding factors that affect emissions and related outcomes that are unrelated to
 the Cap-and-Trade Program. As one important example, industrial activity in California is
 affected by the overall economy and market factors, and may also be affected by other
 state, regional, or local regulatory activity. This can influence levels of GHG and air toxics

OEHHA -18- January 2017

emissions. For example, the US and California experienced a severe economic recession from the late 2000s into the early 2010s, followed by an economic recovery, which occurred in the same period over which the Cap-and-Trade Program was launched and has developed. Another example includes the recent and persistent California drought. Because a large fraction of the state's electricity supply is derived from hydropower, the recent drought has necessitated additional generation of electricity from thermal power plants. Further, during the analysis period, the San Onofre Generating Station (a large nuclear power plant) was decommissioned. This resulted in more in-state emissions than would otherwise have occurred due to electricity generation from thermal power plants.

Practical Steps for Initial Analysis

Limitations to the readily available data place some constraints on the initial analysis described here. More public data are available to describe potential overall changes in pollutant emissions in disadvantaged communities than are available to specifically characterize Cap-and-Trade Program activities that may be influencing those emissions changes (see Section V below). For this reason, OEHHA is first examining the emissions data, and later intends to identify potential regulatory activities that may be contributing to changes in emissions, especially in disadvantaged communities. This report focuses on identifying and describing relevant data sources and how they can be used, gathers readily available data, and presents initial findings regarding those data.

Data Used to Characterize Emissions of GHG and Air Toxics Emissions from GHG Facilities

Various types of information are collected by state and federal agencies on emissions of GHGs and toxic air pollutants from facilities and other entities covered by the Cap-and-Trade Program. Below are the sources of information that provided emissions data for the analysis of impacts and benefits of California's Cap-and-Trade Program described in this report.

Mandatory Reporting of Greenhouse Gas Emissions

GHG emissions must be reported to ARB annually by many industrial sources, fuel suppliers, and electricity importers under the Mandatory Reporting Rule (MRR). ¹⁴ Of these

OEHHA -19- January 2017

¹⁴ More detailed information on Mandatory Greenhouse Gas Emissions Reporting is available from ARB's website at URL: https://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.

facilities/entities, many are also subject to the Cap-and-Trade Program. For such facilities, the submitted emissions data are verified by an accredited third party. The table below describes some of the publicly available data through the MRR.

Table 5. Partial List of Information Available from Mandatory Greenhouse Gas Emissions Reporting.

Source of Information	Description of Available Data
Facility Data	Facility name, ARB identification code, ZIP Code/city, industrial sector, industrial classification code (NAICS)
Total Emissions	Total CO ₂ e from combustion, process, vented, and supplier (in MTCO ₂ e); includes both fossil and biomass-derived fuels
Facility Reported GHG Data (in MTCO₂e)	 CO₂e from non-biogenic sources and CH₄ and N₂O from biogenic fuels ¹⁵ as emitters and fuel suppliers CO₂e from biogenic fuels as emitters and fuel suppliers Electricity importer CO₂e
ARB Calculated Covered Emissions (in MTCO ₂ e)	 Covered emissions as emitters, fuel suppliers, and electricity importers Total covered emissions (combined for entities with multiple) Total non-covered emissions

ARB has publicly provided information on GHG emissions for each year since 2008. However, emissions data for the years 2008 to 2010 are not directly comparable to later years. This is a result of changes in methodology to harmonize with U.S. EPA's GHG reporting regulation. An additional industrial sector has also been brought into the program since GHG reporting began, namely fuel distributors.

In 2015, GHG emissions data were reported for over 800 facilities, 724 of which reported GHG emissions greater than zero. The number of facilities in sectors expected to have on-site emissions was 589 (excluding electricity importers and suppliers of natural gas and transportation fuel). Not all facilities that report GHG emissions under the MRR are required to participate in the Cap-and-Trade Program.

OEHHA -20- January 2017

 $^{^{15}}$ Biomass fuels are derived from biomass products and byproducts, wastes, and residues from plants, animals, and microorganisms. Emissions from combustion of biomass fuels that meet certain criteria are considered biogenic and are exempt from a compliance obligation in the Cap-and-Trade regulations.

ARB also provides data related to how each entity covered by the Cap-and-Trade regulation meets it compliance obligation in terms of the total number of allowances and offsets surrendered each year.¹⁶

Table 6. Information Available in the Annual Compliance Report for the Cap-and-Trade Program (ARB).

Type of Information	n Description of Available Data		
Facility information	Facility name and ARB identification number		
Facility information Compliance Instrument Data	 2013-2014 triennial surrender obligation Total instruments surrendered Total allowances surrendered Offsets surrendered and the types of offset credits and specific offset projects those credits are from Compliance status ("fulfilled" or "unfulfilled") 		

The Cap-and-Trade Program has established definitions of "facility" that clarify the extent of facilities operations that are required to report as a single entity. These definitions are provided in Appendix A.

Air Toxics "Hot Spots" Emission Inventory

Information on emissions of toxic substances from facilities in California is available from the Air Toxics "Hot Spots" Emissions Inventory. Emissions inventory plans are intended to provide "a comprehensive characterization of the full range of hazardous materials that are released, or that may be released, to the surrounding air from the facility" and includes all continuous, intermittent, and predictable air releases (Health and Safety Code section 44340(c)(2)). The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code section 44300-44394, as amended) requires reporting of site-specific emissions of toxic substances based on criteria and guidelines adopted by ARB. ¹⁷ These guidelines outline:

The facilities that are subject to reporting. Generally, any facility¹⁸ or business in
California that emits more than 10 tons per year of organic gases, particulate pollution,
nitrogen oxides, or sulfur oxides, is subject to "Hot Spots" requirements. Certain smaller

OEHHA -21- January 2017

¹⁶ This information is made available through ARB's website at URL:

https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm (see Publicly Available Market Information).
¹⁷ AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation (Guidelines). The current regulation and a detailed description of the guidelines are available on ARB's website at
https://www.arb.ca.gov/ab2588/2588guid.htm#current.

¹⁸ See Appendix A for definition of "facility" under this program.

facilities like gas stations, dry cleaners, and chrome platers are also subject to the requirements. Some "low level" facilities are exempt from further update reporting unless specified reinstatement criteria are met. Reductions in emissions from changes in activities or operations may also exempt some facilities from further reporting requirements. Facilities that have been exempted from compliance with this program may also be reinstated under certain conditions (for example, emissions of a newly listed substance, the establishment of a nearby sensitive receptor such as a school, or an increase in the potency of a substance that it emits).

- The groups of substances to be inventoried. Different chemical substances have different reporting requirements. Emissions must be quantified for over 500 specific substances.
 Production, use, or other presence must be reported for an additional ~200 substances.
 Facilities must report whether they manufacture an additional ~120 substances.
- When facilities are required to report. This is based on prioritization scores, risk
 assessment results, or de minimis thresholds. Emissions inventories developed under
 the "Hot Spots" Program are updated every four years.
- The information a facility operator must include in a facility's update to their emission inventory.
- Criteria by which "Hot Spots" reporting is integrated with other air district programs.
- The information that must be included in the air toxics emission inventory plan and report by a facility operator.
- The source testing requirements, acceptable emission estimation methods, and reporting formats.

Criteria Air Pollutant Emissions

Emissions data for criteria air pollutants from California facilities are collected by county or regional air districts as a result of both state and federal laws. The district data are then reported to ARB. Generally, large facilities report these emissions annually, though facilities with lower rates of emissions may only be required to report every three years.

Data on the emissions of criteria air pollutants for some facilities that are subject to the Capand-Trade regulation have recently been made available on ARB's Integrated Emissions Visualization Tool. ¹⁹ This includes data by facility for the years 2008 to 2014 on emissions of

OEHHA -22- January 2017

¹⁹ Available at URL: https://www.arb.ca.gov/ei/tools/ievt/. For additional information comparing the reporting of GHG and criteria air pollutant emissions, see also URL: https://www.arb.ca.gov/ei/tools/ievt/doc/ievt notes.pdf.

ozone-producing volatile organic compounds (VOCs), nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM 2.5 and PM10), and ammonia (NH₃).

Toxic Release Inventory (TRI; US Environmental Protection Agency)

Another source of emissions data for toxic substances is the US Environmental Protection Agency's (US EPA) Toxic Release Inventory (TRI). ²⁰ Under this program, facilities ²¹ in certain industrial categories with more than 10 full-time equivalent employees that manufacture, process, or otherwise use chemicals are required to report chemical emissions. Industries covered include certain electric power utilities, chemical manufacturing, mining, hazardous waste treatment, and federal facilities.

The list of chemicals for which reporting is required currently contains almost 600 individual chemicals, plus 31 chemical categories. Facilities are required to report emissions that manufacture or process more than 25,000 pounds, or otherwise use more than 10,000 pounds of any listed chemical in the course of a calendar year. Lower thresholds are in place for facilities that manufacture, process, or use certain persistent bioaccumulative toxic (PBT) chemicals.

For industries and facilities required to report, the minimum amounts that must be reported are on the order of 0.1 to 1 pounds per year. Reporting levels for PBT chemicals have no minimum levels. For qualifying facilities, reporting occurs annually.

General Limitations to the Use of Emissions Data as an Indicator of Benefits and Impacts

Emissions data are being used in this report as a proxy for potential exposures to air pollutants that arise from industrial sources, and do not directly correspond to health risks to individuals in communities near facilities. Health risks are typically estimated through health risk assessments of the facilities themselves. Such assessments can take into account a large number of factors, such as: the specific location of the emissions, the fate and transport of the substances emitted (in consideration of stack height, meteorology and terrain), the estimated concentrations of chemicals where people are, the duration of exposures, and the toxicity characteristics of the substances informed by health guidance values (such as cancer potencies and reference exposure levels). However, for an initial screen of potential concerns related to emissions of toxic air pollutants, emissions data provides information to use as a basis for

OEHHA -23- January 2017

²⁰ Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA, or Title III of the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499). Additional information available through U.S. EPA's website at URL: https://www.epa.gov/toxics-release-inventory-tri-program.
²¹ See Appendix A for definition of "facility" under this program.

relative comparison (changes in emissions) and can illuminate the nature of potential hazards arising from facilities.

To address variations in the toxicity of the emitted chemicals, this report performs a toxicity weighting of the emitted chemicals. This weighting puts a greater emphasis on the more highly toxic emitted chemicals than on emitted chemicals with relatively low toxicity.

There are uncertainties associated with emissions data themselves. While the emissions reporting described below is required by law under different statutes, the amounts and types of emissions are self-reported by the regulated industries. This means they may be subject to some reporting errors. Different regulatory programs have different practices in place to verify submitted data, though there may be inaccuracies that are difficult to identify. Reporting requirements can change over time to include additional types of emissions and emission processes. Factors that are used to estimate emissions from specific processes can also be revised over time, leading to changes in the estimates.

VI Toxicity of GHGs and other Air Pollutants

Greenhouse Gases

There is generally low concern for human health from localized emissions of carbon dioxide (CO₂), the primary GHG that is driving climate change. Only at very high concentrations does CO₂ affect human health. For this reason, emissions of CO₂ itself are not considered to be contributing to localized impacts from facilities where it is emitted.

Other GHGs are the "short-lived climate pollutants" including methane, fluorinated gases, and black carbon. Methane is more potent than CO_2 as a GHG, but is generally emitted at lower rates than CO_2 . Sources of methane include agriculture, the oil and gas industry, and from the treatment of waste. Methane is generally not expected to have health effects from localized emissions due to its low toxicity.

Fluorinated gases include chlorofluorocarbons, hydrochlorofluorocarbons, and hydrofluorocarbons, many of which are being phased out of use because of their ozone-depleting potential. Most of the emissions of this class of compound arise from leakage of refrigeration systems. As such, they provide a relatively limited contribution to emissions from facilities regulated under the Cap-and-Trade Program. Similarly, sulfur hexafluoride has numerous uses, but is regulated from early actions outside of the Cap-and-Trade Program due to its very high global warming potential and increasing levels in recent years.

Black carbon is generally created as a product of incomplete combustion of organic fuels, including diesel fuels. Black carbon is a component of particulate pollution (including PM2.5,

OEHHA -24- January 2017

see below) and diesel particulate matter, both of which have well-described human health toxicity concerns, including increasing risk of premature death and cancer. California has substantially reduced black carbon from diesel exhaust from many sources over the past 20 years, corresponding to a 13% reduction in the total annual CO₂ emissions in California.

Criteria Air Pollutants

The criteria air pollutants are common air pollutants for which federal standards are established under the Clean Air Act (42 U.S. Code Chapter 85). The six criteria air pollutants are ozone, particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. California has established more protective standards in some cases. The standards are established to protect even the most sensitive individuals, such as children and elderly. Some of the common sources of exposure and key health effects are described in Table 7 below.

Table 7. Sources of Exposure and Health Effects of Criteria Air Pollutants.

Criteria Air Pollutant	Sources of Exposure	Health Effects	
Ozone	Generated from interaction of sunlight with volatile organic compounds (reactive organic gases), especially hydrocarbons, and nitrogen oxides; ozone formation may be distant from the source of these emissions. Sources include vehicles, industrial facilities, and consumer products, among others.	Damage to the respiratory tract; worsening of symptoms for respiratory diseases like asthma, bronchitis, and emphysema; reduction in lung function; increase susceptibility to infections. People who spend more time outdoors may be especially susceptible.	
Particulate matter (PM)	Many sources of PM; generated by the combustion of most fuels, which produces most of fine PM (particles less than 2.5 microns in diameter, PM2.5); larger particles (PM10) can be generated by blowing dusts. Particles can vary greatly in their composition.	Worsening of heart and lung disease; decreases in lung function and respiratory symptoms, such as coughing or shortness of breath; increases in hospitalizations and deaths. People with heart and lung disease, as well as children and elderly, may be especially susceptible to the effects.	

OEHHA -25- January 2017

Criteria Air Pollutant	Sources of Exposure	Health Effects	
Sulfur dioxide	Combustion of fuel containing sulfur. Industrial sources include certain petroleum refining processes. Other sources are locomotives, ships, and certain diesel equipment.	Respiratory effects include shortness of breath and wheezing. Increases in mortality have been observed from sulfur dioxide exposure. Children, elderly, asthmatics, and people with existing heart disease may be especially sensitive to the effects.	
Nitrogen dioxide	Combustion of fuel by cars, trucks, and at power plants.	Damage to the respiratory tract. Asthmatics may be especially susceptible to the harmful effects of nitrogen dioxide exposures.	
Carbon monoxide	Produced from the incomplete combustion of fuels from a variety of sources.	Dizziness and confusion at high levels of exposure, though unlikely outdoors. Individuals with heart or lung disease may be especially susceptible.	
Lead	Multiple sources, especially processing of metals, waste incineration, battery manufacturing, and aircraft burning leaded aviation fuel.	Harmful to the nervous, cardiovascular, immune, reproductive and developmental systems. Children are especially sensitive to the effects of lead.	

Toxic Air Contaminants

"Toxic air contaminants" are defined in California law as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health (Health and Safety Code section 39655). There are currently almost 200 substances or groups of substances identified as toxic air contaminants by ARB. ²² These substances show a wide range of toxicity characteristics and physical properties that could influence the likelihood of health effects if they are emitted to air. ²³

OEHHA -26- January 2017

²² The current list can be found on the ARB website at URL:

https://www.arb.ca.gov/toxics/quickref.htm#TAC.

23 Information on the types of hazards for many identified toxic air contaminants is available at URL: https://www.arb.ca.gov/toxics/cattable.htm.

Some toxic air contaminants were listed because they were federally designated hazardous air pollutant (pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)). ARB designated others based on evaluations performed by OEHHA that meets specific criteria described in California law (Health and Safety Code section 39660).

VII Results

Toxicity-Weighted Emissions to Air

Most GHG facilities covered by the Cap-and-Trade Program emit a combination of GHGs, criteria air pollutants, and toxic air contaminants. While GHGs themselves tend to be relatively less toxic, co-pollutants that are emitted can vary significantly by facility with respect to their composition and potential toxicity. To provide additional information on how these facilities vary with respect to overall toxicity of emissions, OEHHA derived a "toxicity-weighted" emissions score for each of the facilities for which emissions data were available. The purpose of this analysis was to screen for higher-concern facilities with respect to emission levels and potential chemical toxicity.

The data were derived from the California Air Toxics "Hot Spots" Emissions Inventory for GHG facilities that could be matched across both the "Hot Spots" and Cap-and-Trade Programs. This matching was performed by investigators from UC Berkeley and San Francisco State University. The facility matching involved geocoding facility addresses that were available for each Cap-and-Trade Program GHG facility. The location information was then matched to location information for "Hot Spots" facilities that was made available by ARB. Facilities with close proximity to a listed address and similar facility names were presumed to match. Comparable identities were confirmed by visual inspection of satellite imagery and internet research. In developing this facility data set, some facility locations were adjusted so that they more closely spatially aligned with likely point sources of emissions.

There are several uncertainties associated with the matching of Cap-and-Trade and "Hot Spots" facilities due to the differences between the two regulatory programs. These uncertainties come from differences in how facilities are defined under each program. In some cases, facilities may have multiple operations that are combined for the purpose of reporting GHG emissions. However, these operations may be reported separately for air toxics and criteria air pollutant emissions.

Of the full set of Cap-and-Trade covered facilities from sectors that were expected to produce localized emissions, a subset of 374 facilities were tentatively identified as likely matches to "Hot Spots" facilities. Emissions information for 365 of these facilities was provided to OEHHA by ARB for the 2014 reporting year. These data included annual emissions amounts for

OEHHA -27- January 2017

individual criteria air pollutants (or their precursors for those with ozone-forming potential) and individual chemicals for which reporting is required under the "Hot Spots" Program. A smaller subset of 77 facilities had risk assessments prepared under the "Hot Spots" Program. In these cases, emissions were modeled to identify potential risks in neighboring communities. Since these data were somewhat limited in availability across Cap-and-Trade Program covered facilities, they are not currently being used in the analysis described here.

Because facilities emit multiple chemicals and not all chemicals are equally toxic, OEHHA applied weighting factors to the air toxics emissions data for each facility. OEHHA calculated a toxicity-weighted emissions score for each of the 365 facilities using an approach comparable to that used to calculated toxicity-weighted emissions under US EPA's Toxic Release Inventory Program. To apply a comparable methodology here, US EPA's Inhalation Toxicity Scores for individual chemicals were matched and applied to the chemical emissions levels for air toxics (pounds emitted per year) from each facility. ²⁴ Some chemicals whose emissions are required to be reported in the "Hot Spots" Program did not have US EPA toxicity weights available. These compounds are currently excluded from the analysis. Toxicity weights may be established for these compounds in the future.

Toxicity weight is described by US EPA as follows: 25

"This weight is a proportional numerical weight applied to a chemical based on its toxicity. The toxicity of a chemical is assessed using EPA-established standard methodologies. For each exposure route, chemicals are weighted based on their single, most sensitive adverse chronic human health effects (cancer or the most sensitive noncancer effect). In the absence of data, the toxicity weight for one pathway is adopted for the other pathway. The range of toxicity weights is approximately 0.02 to 1,400,000,000."

This type of weighting was also used in characterizing air toxics emissions in the California Communities Environmental Health Screening Tool (CalEnviroScreen). Toxicity weights do not include the criteria air pollutants (NO_x, PM2.5, etc.). Those pollutants are evaluated separately below.

OEHHA -28- January 2017

²⁴ OEHHA used US EPA values here because they were readily available. Since California-specific risk and toxicity data may be available for many chemicals, these values will be updated for future analyses. As an example, US EPA does not include a toxicity weight for diesel exhaust, which can be an important contributor to cancer risk from facilities.

²⁵ Further information is available on U.S. EPA's website at URL: https://www.epa.gov/trinationalanalysis/hazard-and-risk-tri-chemicals-2014-tri-national-analysis.

As discussed above, the toxicity weights themselves for each compound are not a measure of risk or likelihood of harm, but provide a way to screen overall emissions from facilities that allows comparisons and the identification of those emissions of highest overall concern.

The emissions characteristics of facilities differ by industry. Using the information on emissions reported by facilities, the most frequently reported specific chemical emissions are described in Table 8 below. Across sectors, numerous air toxics are reported to be emitted that are commonly created by fuel combustion. These include formaldehyde, benzene, toluene, xylenes, 1,3-butadiene, diesel particulate matter, and polycyclic aromatic hydrocarbons (PAHs). The composition of chemicals emitted from fuel combustion depends on the type of fuel burned (oil, coal, natural gas, biomass). Other emissions are likely to be associated with a type of industry. For example, nearly all cement plants report emissions of nickel, naphthalene, lead, formaldehyde, hexavalent chromium, cadmium, beryllium, benzene, and arsenic. (One cement plant in this data set reported very low activity in 2014 with respect to both GHG and air toxics emissions.) Oil and gas production facilities emit numerous organic chemicals: benzene, formaldehyde, naphthalene, toluene, xylenes, acetaldehyde, PAHs, acrolein, ethylbenzene, and 1,3-butadiene.

Toxicity-weighted emissions values were calculated for each of the facilities for which air toxics emissions data were available, as described above. The highest-scoring 25 facilities are presented in Table 9 below. While multiple sectors are represented in this group, some sectors appear more frequently among those with the highest toxicity-weighted emissions. The highest-scoring 25 facilities in the state include several cement plants (6), refineries (6), and facilities associated with oil and gas production (6).

Table 8. Frequency of Specific Chemical Emissions for Facilities with Reported Air Toxics Emissions by Cap-and-Trade Sector (Criteria Air Pollutants Excluded).

Sector	Facilities*	Chemicals most free occurrences) *	equently reported emit	ted (number of
Cement Plants	9	Nickel (8) Naphthalene (8) Lead (8) Formaldehyde (8) Hexavalent chromium & compounds (8) Cadmium (8) Beryllium (8) Benzene (8) Arsenic (8) Selenium (7) Mercury (7) Manganese (7)	Copper (7) Zinc (6) Xylenes (mixed) (6) Toluene (6) Hydrochloric acid (6) Chromium (6) Benzo(a) pyrene (6) Acetaldehyde (6) 2,3,7,8-Tetrachlorodibenzo- p-dioxin (6) 1,3-Butadiene (6) Silica, crystalline (respirable) (5) Indeno(1,2,3-cd)pyrene (5)	Ethyl benzene (5) Dibenz(a,h)anthracene (5) Benzo(k)fluoranthene (5) Benzo(b)fluoranthene (5) Benz(a)anthracene (5) 2,3,7,8-Tetrachloro- dibenzofuran (5) 2,3,4,7,8-Pentachloro- dibenzofuran (5) 1,2,3,4,6,7,8-Heptachloro- dibenzo-p-dioxin (5) 1,2,3,4,6,7,8- Heptachlorodibenzofuran (5

OEHHA -29- January 2017

Sector	Facilities*	Chemicals most frequently reported emitted (number of occurrences) *		
Cogeneration Facilities	48	Formaldehyde (43) Benzene (43) Toluene (35)	Ammonia (34) Naphthalene (31) Acetaldehyde (29)	Xylenes (mixed) (27) Acrolein (26) 1,3-Butadiene (26)
Electricity Generation Facilities	90	Formaldehyde (80) Benzene (80) Ammonia (71) Naphthalene (60)	1,3-Butadiene (50) Toluene (47) Arsenic (46) Nickel (45)	Lead (45) Cadmium (45) Hexavalent chromium & compounds (40) Xylenes (mixed) (39)
Hydrogen Plants	6	Formaldehyde (6) Benzene (6)	Ammonia (5) PAHs, total (4)	Naphthalene (4)
Oil and Gas Production Facilities	47	Benzene (40) Formaldehyde (38) Naphthalene (32)	Toluene (28) Xylenes (mixed) (25) Acetaldehyde (25)	PAHs, total (24) Acrolein (24)
Refineries	20	Ammonia (19) Benzene (18) Formaldehyde (17) Nickel (16)	Lead (16) Hexavalent chromium & compounds (16) Cadmium (16) Naphthalene (15)	Arsenic (14) Beryllium (13) 1,3-Butadiene (13) PAHs, total (12)

Sector	Facilities*	Chemicals most frequently reported emitted (number of occurrences) *			
Other	114	$\label{thm:condition} \textbf{Numerous industrial activities are represented in the "Other Combustion}$			
Combustion		Sources" category. A few examples are presented below.			
Sources		Fruit and Vegetable Canning	Propylene (4)	Arsenic (2)	
		Toluene (8)	PAHs, total (4)	Ammonia (2)	
		Formaldehyde (8)	Nitrous oxide (4)	Acetaldehyde (2)	
		Benzene (8)	Naphthalene (4)		
		Xylenes (mixed) (6)	Methane (4)	Colleges, Universities, and	
		Propylene (6)	Hexane (4)	Professional Schools	
		Nitrous oxide (6)	Formaldehyde (4)	Formaldehyde (8)	
		Naphthalene (6)	Ethyl benzene (4)	Benzene (8)	
		Methane (6)	Carbon dioxide (4)	Nickel (7)	
		Hexane (6)	Benzene (4)	Lead (7)	
		Ethyl benzene (6)	Acrolein (4)	Hexavalent chromium &	
		Carbon dioxide (6)	Acetaldehyde (4)	compounds (7)	
		Acrolein (6)		Cadmium (7)	
		Acetaldehyde (6)	Paperboard Mills	Arsenic (7)	
		PAHs, total (5)	Formaldehyde (3)	Naphthalene (6)	
		Ammonia (5)	Benzene (3)	Mercury (6)	
		Diesel engine exhaust,	Toluene (2)	Toluene (5)	
		particulate matter (Diesel	Nickel (2)	Methylene chloride (5)	
		PM) (4)	Naphthalene (2)	Manganese (5)	
			Lead (2)	1,3-Butadiene (5)	
		Dry, Condensed, and	Hexavalent chromium &	Xylenes (mixed) (4)	
		Evaporated Dairy Product	compounds (2)	Acrolein (4)	
		Manufacturing	Cadmium (2)	Acetaldehyde (4)	
		Diesel engine exhaust,			
		particulate matter (Diesel			
		PM) (5)			
		Xylenes (mixed) (4) Toluene (4)			

^{*} Facility count is the number of facilities for which air toxics emissions data are available, but did not report emitter-covered GHG emissions in 2014.

OEHHA -31- January 2017

Table 9. Twenty-Five Cap-and-Trade Facilities with the Highest Toxicity-Weighted Air Emissions.* Shaded Facilities Are In or Within ½ Mile of an SB 535 Census Tract.

Facility Name and Approximate Location	Sector	Tox-Weighted Air Emissions	CEIDARS ID	ARB ID
CalPortland Company, Mojave Plant, Mojave	Cement Plant	11,128,486,856	15_KER_9	101029
California Resources Elk Hills, LLC, 35R Gas Plant, Tupman	Oil & Gas Production, Supplier of NG/ NGL/ LPG	8,019,256,117	15_SJU_2234	104014
Riverside Cement Company, Oro Grande	Cement Plant	4,773,322,002	36_MOJ_1200003	100013
Cemex Construction Materials Pacific LLC, Victorville Plant	Cement Plant	3,981,635,547	36_MOJ_100005	101476
Lake Shore Mojave, LLC (Shutdown), Boron	Cogeneration	3,154,251,353	KER_593	100218
U.S. Borax, 93516, Boron	Other Combustion Source	3,154,251,353	15_KER_28	100300
PG&E Hinkley Compressor Station, Hinkley	Oil & Gas Production	2,695,090,703	36_MOJ_1500535	101290
Lehigh Southwest Cement Co., Tehachapi	Cement Plant	2,565,789,410	15_KER_20	101461
Mitsubishi Cement 2000, Lucerne Valley	Cement Plant	2,073,213,791	36_MOJ_11800001	101010
Shell Oil Products US, Martinez	Refinery, Hydrogen Plant	1,916,625,223	7_BA_11	100914
PG&E Topock Compressor Station, Needles	Oil & Gas Production	1,576,205,185	36_MOJ_1500039	101031
ExxonMobil Oil Corporation, Torrance Refinery Torrance	Refinery, Hydrogen Plant, CO ₂ Supplier	1,531,495,371	19_SC_800089	100217
Searles Valley Minerals Inc., Trona	Other Combustion Source	1,487,264,625	36_MOJ_900002	100011
Southern California Gas Co., South Needles Facility, Needles	Oil & Gas Production	1,401,623,408	36_MOJ_3100068	101346
Coso Power Developers (Navy II), Geothermal, Little Lake	In-State Electricity Generation	1,280,562,586	15_KER_328	101669
National Cement Company, Lebec	Cement Plant	1,151,169,990	15_KER_21	101314
Freeport-McMoRan Oil & Gas LLC, SJV Basin Facility, Fellows	Oil & Gas Production	1,090,450,784	15_SJU_1372	104081
Imerys Minerals California, Inc., Lompoc	Other Combustion Source	1,047,824,807	42_SB_12	101318
Grayson Power Plant, Glendale	In-State Electricity Generation	873,364,347	19_SC_800327	100181
Valero Refining Company, Refinery and Asphalt Plant, Benicia	Refinery, Hydrogen Plant, CO ₂ Supplier	830,573,455	48_BA_12626	100372
Tesoro Refining and Marketing Co., Martinez	Refinery, Hydrogen Plant, CO ₂ Supplier	786,966,781	7_BA_14628	101331
Southern California Gas Co - Aliso Canyon Facility, Northridge	Oil & Gas Production	716,224,953	19_SC_800128	101349
Spreckels Sugar Company, Inc., Brawley	Other Combustion Source	708,360,193	2014_13_IMP_10	101241
Chevron Products Company, El Segundo	Refinery, Hydrogen Plant, CO ₂ Supplier	697,864,142	2014_19_SC_800030	100138
Phillips 66 Company, Los Angeles Refinery, Wilmington	Refinery, Hydrogen Plant, CO ₂ Supplier	673,822,489	2014_19_SC_171107	100329

^{*}Top 25 of the 297 facilities for which scores could be calculated using 2014 emissions data.

OEHHA -32- January 2017

Air Toxics and GHGs Emissions

Plotting data graphically for visual inspection and calculation of correlation coefficients are approaches to the evaluation of data that may be informative with respect to relationships between greenhouse gas emissions and toxic air contaminants.

The Pearson correlation coefficient is a measure of the linear dependence between two variables, in this case between GHG emissions and a number of different pollutant emission measures. A Pearson correlation coefficient is high when the relationship between two measures increases linearly in proportion to each other. Generally, high positive correlation produces a coefficient r-value of greater than 0.8, with moderately high correlation above 0.5, moderate when the measures are between 0.3 and 0.5, and low when below 0.3 to zero but statistically significant. Inversely correlated values are negative. The Pearson correlation is vulnerable to outlier data, especially when there is a large range of values represented in the analysis. For this reason, an additional correlation analysis was conducted using the Spearman correlation coefficient. In this analysis, the rank order of each of two sets of measures is compared. This coefficient is better able to identify data sets that may be related, but the relationship may be more complex than linear. Another method to address data over a larger range is to make logarithmic transformations. For several of the data sets here, logarithmically transforming the data strengthened the correlations.

Figure 3 shows a scatterplot of GHG emissions versus toxicity-weighted emissions from facilities for which both types of data are available. The GHG emissions used are emitter-covered emissions for the year 2014, excluding emissions by facilities that were not covered by the program (e.g., biomass) and emissions related to electricity imports that were not local. This analysis only included facilities with emitter-covered emissions for which 2014 air toxics data were available (n = 298). Overall, this correlation was moderate, positive and highly significant by both measures (Pearson coefficient, r = 0.32; Spearman coefficient, r = 0.44; both statistically significant, p<0.0001).

When facilities were subdivided by Cap-and-Trade Program industrial sectors, some sectors showed considerably higher positive relationships. The scatterplots and correlations are presented in Figure 4 and Table 10 below, respectively. Refineries overall showed high positive correlations ($r \cong 0.8$), followed by oil and gas production facilities, hydrogen plants, and cement plants, each of which were moderately correlated using the Pearson coefficient ($r \cong 0.5$). For refineries, GHG emissions were highly correlated with toxicity-weighted air toxics emissions, as indicated by both the Pearson (0.82) and Spearman (0.86) correlation coefficient ($p \le 0.0001$ for both coefficients). The Pearson correlations for hydrogen and cement plants were also supported by positive correlations using the Spearman coefficient. For the oil and gas production facilities, both measures showed positive correlation, but only the Pearson was

OEHHA -33- January 2017

statistically significant, suggesting that outliers or extreme values may have contributed to the Pearson correlation. It is also likely that the nature of the relationship between emissions of GHGs and air toxics varies substantially across these types of facilities. Also, how these facilities are defined differs across the different regulatory programs (see Appendix A for the definitions). 26 For electricity generation facilities, GHG emissions and toxicity-weighted emissions also showed low correlation; however, emissions levels across facilities varied broadly and logarithmic transformation resulted in a moderate (Pearson r = 0.41) and a highly significant correlation (p<0.001).

OEHHA -34- January 2017

²⁶ ARB provides additional information on the differences between oil and gas facilities under different programs. See URL: https://www.arb.ca.gov/ei/tools/ievt/doc/ievt_oil_gas_crosswalk.pdf. The crosswalk table described in this document was not used for the initial analysis performed by OEHHA in this report.

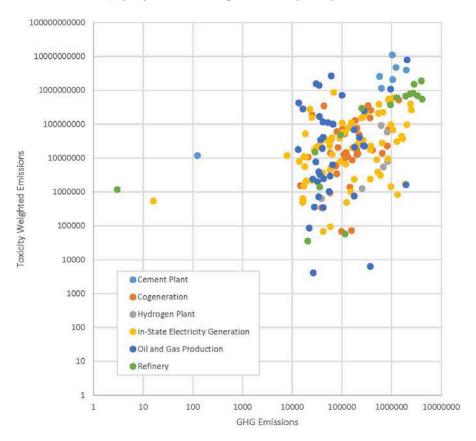


Figure 3. Scatterplot of Toxicity-Weighted Emissions vs GHG Emissions from GHG Facilities with Emissions Data, by Cap-and-Trade Program Sectors (n=201)*

OEHHA -35- January 2017

^{*}The figure excludes "Other Combustion Sources" Category. GHG Emissions in $MTCO_2e$. Plotted on a Logarithmic Scale).

Toxicity-Weighted Emissions Toxicity Weighted Emissions (in 1000s) 10 100 1000 10000 0.1 GHG Emissions (in 1000s) GHG Emissions (in 1000s) Cement Plants (n = 9) Cogeneration Facilities (n = 45) Toxixity Weighted Emissions **Foxicity-Weighted Emissions** 1000 10000 GHG Emissions (in 1000s) **GHG** Emissions Hydrogen Plants (n = 7) Oil and Gas Production Facilities (n = 41) foxicity Weighted Emissions **Toxicity-Weighted Emissions** (in 1000s) 1000 10000 100000 1000 100 GHG Emissions GHG Emissions (in 100s) **Electricity Generation Facilities (n = 83)** Refineries (n = 16)

Figure 4. Scatterplots of Toxicity-Weighted Emissions vs GHG Emissions (MTCO₂e) by Capand-Trade Program Sectors (plotted on logarithmic scale).

OEHHA -36- January 2017

Table 10. Correlation for GHG Emissions vs. Toxicity-Weighted Air Toxics Emissions for Capand-Trade Facility by Sector (2014 Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05).

Sector	No.	Pearson	Stat. Sig.	Spearman	Stat. Sig.	
		(r-value)	(p-value)	(r-value)	(p-value)	
Cement Plants	9	0.474	0.198	0.733	0.025	
Cogeneration	45	-0.004	0.979	0.243	0.108	
Hydrogen Plants	7	0.481	0.274	0.714	0.071	
Oil & Gas Production	41	0.555	0.0002	0.100	0.533	
Electricity Generation	83	0.173	0.119	0.282	0.0098	
Refineries	16	0.818	0.0001	0.862	<0.0001	

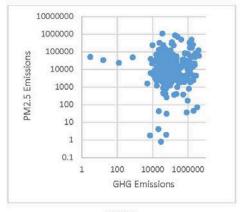
Criteria Air Pollutant and GHG Emissions

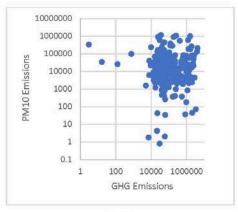
The relationships between GHG emissions and the emissions of specific criteria air pollutants from facilities were investigated in a manner similar to the analysis above using toxicity-weighted emissions. Figure 5 below show scatterplots of emissions of GHGs from facilities (as above) versus emissions of criteria air pollutants using data provided by ARB. Table 11 below shows the Pearson and Spearman correlation coefficients for each of the comparisons. This analysis includes facilities from all sectors for which data are available.

Because of the wide range of emissions of both GHGs and criteria air pollutants and the diverse nature of the industries analyzed here, the Spearman correlation likely provides more insight into probable relationships than the Pearson correlation. Here, Spearman correlations were moderately positive (r \cong 0.5) for total PM, PM10, PM2.5, SOx and NOx, individually. Correlations were poorer, though still positive, for organic and volatile gases (ozone-precursors), and carbon monoxide. Each of these correlations was statistically significant.

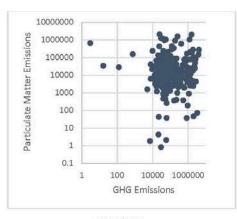
OEHHA -37- January 2017

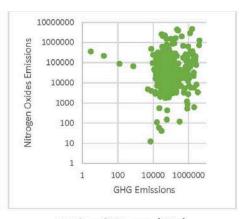
Figure 5. Scatterplots of Criteria Air Pollutant Emissions from All GHG Facilities with Emissions Data for the 2014 Reporting Year ($n \approx 316$; Criteria Air Pollutant Emissions vs. GHG Emitter-Covered Emissions in MTCO₂e).





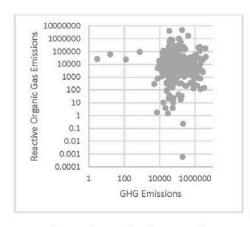
PM2.5 PM10

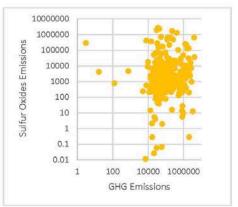




Total PM Oxides of Nitrogen (NOx)

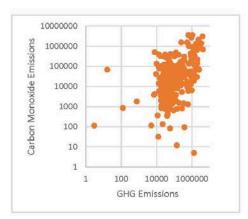
OEHHA -38- January 2017





Ozone-Generating Compounds (Reactive Organic Gases)

Oxides of Sulfur (SOx)



Carbon Monoxide

Table 11. Correlations between Emitter Covered GHG Emissions (in MTCO₂e) and Criteria Air Pollutant Emissions (in pounds) for All Cap-and-Trade Facilities with Emissions Data (2014 Data).

	Correlation	ı (r-value)*				
Pollutant	Pearson	Spearman				
со	0.451	0.394				
NOx	0.515	0.508				
SOx	0.460	0.564				
PM	0.467	0.455				
PM10	0.617	0.499				
PM2.5	0.718	0.554				
ROG	0.642	0.246				
TOG	0.693	0.389				
VOCs	0.652	0.246				

^{*} All correlation r-values for both tests were statistically significant (p<0.0001).

OEHHA also examined relationships between individual criteria air pollutants and GHG emissions by industrial sector. These correlations are presented in a table in the Appendix (p. A-3). For refineries and in-state electricity generation facilities, correlations were moderate to high. All were statistically significant (p<0.05). Other sectors with high correlations include cement plants (NOx, PM, PM10, and VOCs) and hydrogen plants (TOG, VOCs).

Case Study: Cement Plants

Cement manufacturing facilities were selected for a further analysis of the relationship between GHG emissions and emissions of toxic air contaminants. This sector was selected because (1) many of these facilities are among the highest scoring with respect to toxicity-weighted emissions to air (see Table 9) and (2) multi-year air toxics and criteria air pollutant emissions data are available from US EPA's Toxic Release Inventory (TRI) Program and ARB, respectively. While TRI data have not yet been broadly matched for each facility across all Capand-Trade facility sectors, TRI emissions data are available for the nine cement plants that are currently covered by the Cap-and-Trade Program. The nine facilities are listed in Table 12 below and shown on the map in Figure 6.

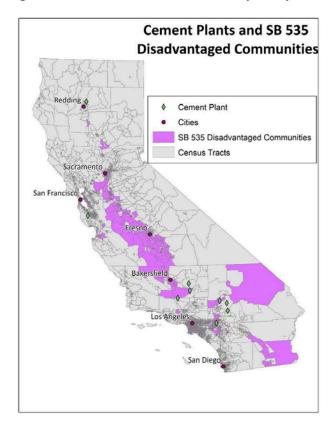
OEHHA -40- January 2017

Table 12. California Cement Plants Evaluated for GHG and Air Toxics Emissions.

Approx. Location			
Colton			
Mojave			
Victorville			
Cupertino			
Redding			
Tehachapi			
Lucerne Valley			
Lebec			
Oro Grande			

^{*}This facility ceased kilning operations in 2009; however, the plant retains grinding and distribution activities.

Figure 6. Location of Cement Plants Covered by the Cap-and-Trade Program.



OEHHA -41- January 2017

The emissions data for these facilities were obtained for the years 2011-2014. GHG emissions were represented by those emissions that occurred locally and were covered by the Cap-and-Trade Program (emitter-covered emissions). TRI data obtained were toxicity-weighted emissions to air, as described above. Tsince US EPA provides a calculated toxicity-weighted score for each facility, it was not necessary to adapt any of the chemical-specific scores, as was done for the data that originated from California's "Hot Spots" Program. PM2.5 emissions data were obtained from ARB's CEIDARS (California Emission Inventory Development and Reporting System) data, which was downloaded from ARB's Integrated Emissions Visualization Tool.

Trends in emissions of both GHGs, air toxics, and PM2.5 are represented in Figure 7 below for each cement plant. One plant, CalPortland Colton, reported very low levels of GHGs and air toxics across all four years because it ceased kilning operations in 2009, though it continued to grind cement products. (This facility was excluded from the chart.) Across years within a given facility, there tended to be reasonable correlations in trends over time between GHG and toxicity-weighted emissions (for example, Cemex Construction Materials Pacific, Lehigh Southwest Cement Cupertino, Mitsubishi Cement, and Riverside Cement Oro Grande). Others showed poorer correlation (for example, CalPortland Mojave and National Cement). The pattern for National Cement is notable for a sudden increase in toxicity-weighted emissions in 2014. Further investigation of the specific chemical emissions data for this facility revealed that this increase was attributable to new reporting of chromium compound emissions in 2014, a departure from previous years. Since chromium emissions are generally consistently reported from cement plants, it is likely that the lack of chromium emissions for 2011-2013 is anomalous.

While year-over-year emissions at individual cement plants show some positive correlations, relative emissions of GHGs and toxicity-weighted air pollutants across facilities show fewer positive relationships. For example, Cemex Construction Materials Pacific had among the highest GHG emissions in this sector, while it was among the lower-scoring facilities for overall toxicity-weighted emissions, as reported to US EPA in their TRI program.

Although the observations from this specific industry are not directly applicable to other industries, this limited set of data suggests that year-over-year changes in GHGs within a facility are potentially meaningful in estimating changes in more toxic pollutants.

²⁷TRI data were obtained through the TRI.NET tool available at URL: https://www.epa.gov/toxics-release-inventory-tri-program/download-trinet.

²⁸ Toxicity-weighted emissions from TRI are not directly comparable to those calculated from California "Hot Spots" emissions data. These are different regulatory programs with different reporting requirements.



Figure 7. Cement Plants: Emitter Covered Emissions of GHGs (MTCO2e, MRR Data) (Top), Toxicity-Weight Air Emissions (TRI Data) (Middle) and PM2.5 Emissions (in tons, CEIDARS Data) (Bottom) over the Years 2011-2014.

Pearson and Spearman correlation coefficients were calculated using 2014 data on emissions of GHGs, air toxics, and PM2.5 and are shown in Table 13. The 2014 data used to calculate the correlations is shown graphically in Figure 7. GHG emissions and toxicity-weighted air emissions (TRI data) were not found to be correlated. A significant relationship (Spearman $r \cong 0.786$, p-value = 0.0208) was observed between GHG emissions and PM2.5 emissions.

Table 13. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. Toxicity-Weighted Air Emissions (TRI Data) or PM2.5 Emissions (CEIDARS Data) for Eight Cement Plants

GHG Emissions vs	No.	Pearson (r-value)	Stat. Sig. (p-value)	Spearman (r-value)	Stat. Sig. (p-value)	
Toxicity-weighted air emissions	8	0.097	0.82	0.405	0.32	
PM2.5	8	0.593	0.122	0.786	0.0208	

^{*2014} Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05

Case Study: Refineries

Refineries represent another industrial sector covered by the Cap-and-Trade Program for which both GHG emissions and air toxics emissions data are available. Facilities from this sector were also identified as having among the highest toxicity-weighted emissions (see Table 9 above). Table 14 below lists 19 refineries reporting covered emissions in 2014. Most of these facilities are within one-half mile of an SB 535 disadvantaged census tract. Facilities have been grouped here by additional activities performed by the facilities that are relevant to GHG emissions, namely hydrogen production (generally for use by the refinery) and CO₂ production for off-site distribution.

OEHHA -44- January 2017

Table 14. California Refineries Evaluated for GHG and Air Toxics Emissions. Shaded Rows Indicate Facilities within One-Half Mile of an SB 535 Disadvantaged Census Tract.

	Approx.			
Facility Name	Location	Sectors*		
Alon Bakersfield Refinery, Areas 1 & 2	Bakersfield	Refinery		
Edgington Oil Company	Long Beach	Refinery		
Kern Oil Refinery	Bakersfield	Refinery		
Lunday-Thagard Company, DBA World Oil Refining	South Gate	Refinery		
Paramount Petroleum Corporation Refinery	Paramount	Refinery		
Phillips 66 Company, Santa Maria Refinery	Arroyo Grande	Refinery		
Ultramar Inc, Valero Wilmington	Wilmington	Refinery		
Phillips 66 Company, San Francisco Refinery	Rodeo	Refinery, H ₂		
San Joaquin Refining Company	Bakersfield	Refinery, H ₂		
Shell Oil Products US	Martinez	Refinery, H ₂		
Chevron Products Company	El Segundo	Refinery, H ₂ , CO ₂		
Chevron Products Company	Richmond	Refinery, H ₂ , CO ₂		
ExxonMobil Oil Corporation	Torrance	Refinery, H ₂ , CO ₂		
Phillips 66 Company, Los Angeles Refinery	Carson	Refinery, H ₂ , CO ₂		
Phillips 66 Company, Los Angeles Refinery	Wilmington	Refinery, H ₂ , CO ₂		
Tesoro Refining & Marketing Company LLC, Los Angeles Refinery	Carson	Refinery, H ₂ , CO ₂		
Tesoro Refining and Marketing Company	Martinez	Refinery, H ₂ , CO ₂		
Valero Refining Company, Refinery and Asphalt Plant	Benicia	Refinery, H ₂ , CO ₂		

^{*} Refinery activities include production of hydrogen (H₂) on-site and production of CO₂ for distribution.

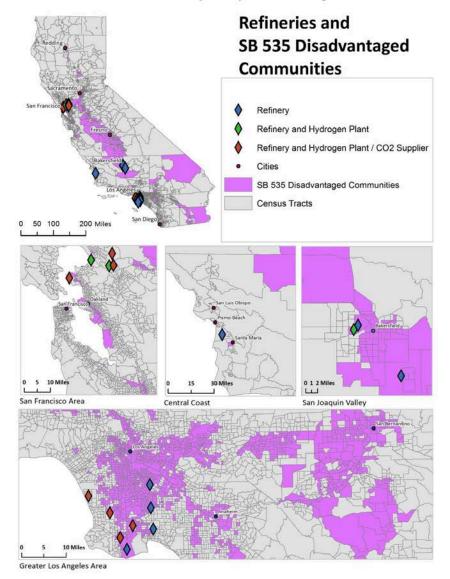


Figure 8. Location of Refineries Covered by the Cap-and-Trade Program.

OEHHA -46- January 2017

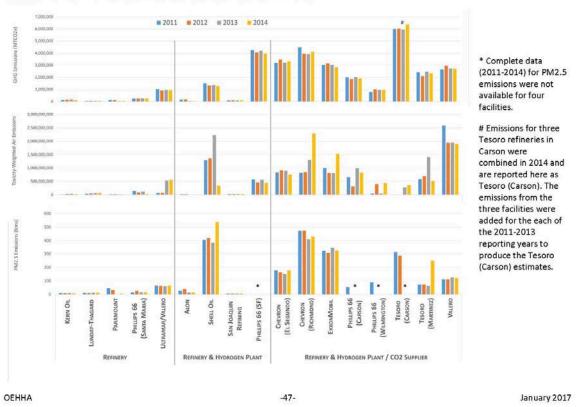


Figure 9. Refineries: Emitter Covered Emissions of GHGs (MRR Data) (Top), Toxicity-Weighted Air Emissions (TRI Data) (Middle), and PM2.5 Emissions (CEIDARS Data) (Bottom) for 18 Refineries Over the Years 2011-2014.

Charts showing the trends in GHG, air toxics, and PM2.5 emissions over the years 2011-2014 are shown in Figure 8. Edgington Oil Company was omitted from the chart because emissions levels were negligible over this reporting period.

Correlations between covered GHG emissions and toxicity-weighted air emissions from refineries were positive and statistically significant using this US EPA data set for air toxics emissions (Pearson r-value = 0.56; p = 0.015; Spearman r-value 0.81, p<0.0001); the correlations increased with logarithmic transformation (Pearson r-value = 0.87, p<0.00001). Visual inspection of the overall patterns also suggests facilities with higher emissions of GHGs tend to have higher emissions of both toxicity-weighted emissions and PM2.5.

In certain cases, the emission levels across these types of facilities did not correlate well. For example, the Shell Oil refinery and hydrogen plant (Martinez) produced moderate GHG emissions, but it was one of the highest sources of PM2.5 emissions across all facilities. Similarly, the Valero refinery, hydrogen plant, and CO₂ distributor (Benicia) also produced modest levels of GHGs, but it had among the highest rates of toxicity-weighted air emissions. Differences in relative emissions may correspond, for example, to the types of products that are made at different facilities.

Table 15. Correlations for Emitter Covered Emissions of GHGs (MRR Data) vs. PM2.5 Emissions (CEIDARS Data) or Toxicity-Weighted Air Emissions (TRI Data) for Refineries*.

GHG Emissions vs	No.	Pearson (r-value)	Stat. Sig. (p-value)	Spearman (r-value)	Stat. Sig. (p-value)
Toxicity-weighted air emissions	18	0.563	0.0150	0.806	<0.0001
PM2.5	14	0.914	< 0.00001	0.916	< 0.00001

^{*2014} Emissions Data; Shaded r-Values Represent Statistically Significant Results, p<0.05

VIII Discussion & Conclusions

This initial analysis is intended to inform future investigation of potential benefits and impacts to disadvantaged communities from emissions of toxic air pollutants, especially to the extent they are influenced by the greenhouse gas limits put in place through activities pursuant to AB 32. However, there are not enough emissions data available at this time to allow for a comprehensive and conclusive analysis. This report makes some preliminary findings that OEHHA expects to build upon in future analyses as it acquires and evaluates more data, but does not provide definitive findings regarding the effects of the GHG limit on any individual community, or disadvantaged communities in general.

OEHHA -48- January 2017

Still, at this point in time, the analysis shows that many SB 535 disadvantaged communities are likely to see benefits or impacts from changes in emissions from the facilities covered under the Cap-and-Trade Program. This is because a disproportionate number of these facilities are located in or very close to these communities, and 2014 data show that overall GHG emissions appear to be positively correlated with criteria air pollutants and toxic air contaminants, although within specific industrial sectors not all correlations are statistically significant. In addition, some of the most highly polluting of these facilities are more likely to be located in these communities.

The relationship between greenhouse gas and toxic air pollutant emissions is complex. Fuel combustion is a primary source of GHG emissions across many of the industrial sectors that are currently covered by the Cap-and-Trade Program. Fuel combustion is also likely to produce a number of toxic air pollutants. For this reason, responses by facilities to the Cap-and-Trade Program that result in reductions in fuel use or increases in fuel efficiency are likely to have benefits from reductions of toxic pollutants at similar levels of production. Toxic air pollutants from activities other than fuel combustion are likely to vary widely by industrial processes. Additional investigation is warranted to understand how industrial facilities will comply with the Cap-and-Trade Program's requirements over time and how this may affect the release of air toxics.

For calendar year 2014 data, there are positive correlations between GHG, PM2.5 and toxic air pollutant emissions. The correlation between GHG and toxic emissions is especially notable in this initial analysis for refineries, hydrogen plants, and cement plants, although the total number of facilities in each of these sectors is relatively small. Further analysis by industrial sector and by specific chemical pollutants may reveal additional important relationships.

Future Data Collection and Analysis

The key challenge in analyzing the benefits and impacts of climate-change programs on disadvantaged communities is acquiring adequate data. As discussed in this report, data on emissions of GHGs, criteria air pollutants and toxic air pollutants are collected by multiple entities under different programs and statutory mandates. To date, there is no co-reporting of GHG and toxic emissions, and differences in reporting requirements across regulatory programs can complicate data analysis. In addition, toxic emissions data for many facilities are only updated every four years, further limiting conclusions that can be reached. Co-reporting of criteria, air-toxic and GHG emissions for the facilities subject to the Cap-and-Trade Program would aid investigation of emissions impacts. OEHHA will continue to acquire and analyze data for future reports, which will build upon the initial findings presented in this report.

Also, the Cap-and-Trade Program is still new, making it difficult to discern trends in how the program over time may be affecting emissions of criteria air pollutants and toxic air

OEHHA -49- January 2017

contaminants. As the program continues to generate data over the next several years, it will be easier to detect and evaluate any such trends. It will also be important to evaluate the Cap-and-Trade Program in concert with other climate policies to evaluate the entire climate change program in aggregate.

In the near-term, OEHHA intends to obtain pre-2014 toxic air pollutant data to investigate how such data can be used to analyze impacts in SB 535 disadvantaged communities. OEHHA will also explore how Cap-and-Trade Program data may be helpful to understanding the drivers of changes in toxic pollutant emissions.

OEHHA also intends to further examine relationships between the emissions of GHGs and toxic air pollutants in specific industrial sectors in order to gain a better understanding of likely benefits or impacts that may result from changes in GHG emissions, even if air toxics emissions data are not available.

Lastly, OEHHA will explore opportunities to examine potential benefits and impacts in disadvantaged communities for other AB 32 programs outside of the Cap-and-Trade Program. OEHHA will work with ARB in developing analyses to support implementation of the Cap-and-Trade Adaptive Management Program to identify and track any emissions increases that could be attributable to the Cap-and-Trade Program.

Appendix A

California's Cap-and-Trade Program, Air Toxics "Hot Spots" Program, and US EPA's Toxic Release Inventory Program each has slightly different definitions of "facility". Some of these differences may have implications for how emissions data are reported such that there may not be an exact one-to-one relationship.

The following definitions of "facilities" are from different programs:

Cap-and-Trade Program

- (144) (A) "Facility," unless otherwise specified in relation to natural gas distribution facilities and onshore petroleum and natural gas production facilities as defined in section 95802(a), means any physical property, plant, building, structure, source, or stationary equipment located on one or more contiguous or adjacent properties in actual physical contact or separated solely by a public roadway or other public right-of-way and under common ownership or common control, that emits or may emit any greenhouse gas. Operators of military installations may classify such installations as more than a single facility based on distinct and independent functional groupings within contiguous military properties.
- (B) "Facility," with respect to natural gas distribution for the purposes of sections 95150 through 95158 of MRR, means the collection of all distribution pipelines and metering-regulating stations that are operated by a Local Distribution Company (LDC) within the State of California that is regulated as a separate operating company by a public utility commission or that are operated as an independent municipally-owned distribution system.
- (C) "Facility," with respect to onshore petroleum and natural gas production for the purposes of sections 95150 through 95158 of MRR, means all petroleum and natural gas equipment on a well-pad, or associated with a well pad or to which emulsion is transferred and CO₂ EOR operations that are under common ownership or common control including leased, rented, or contracted activities by an onshore petroleum and natural gas production owner or operator and that are located in a single hydrocarbon basin as defined in section 95102(a) of MRR.

When a commonly owned cogeneration plant is within the basin, the cogeneration plant is only considered part of the onshore petroleum and natural gas production facility if the onshore petroleum and natural gas production facility operator or owner has a greater than fifty percent ownership share in the cogeneration plant. Where a person or entity owns or operates more than one well in a basin, then all onshore petroleum and natural gas production equipment associated with all wells that the person or entity owns or operates in the basin would be considered one facility.

Air Toxics 'Hot Spots' Program

Health and Safety Code, Section 44304 defines facility as "every structure, appurtenance, installation, and improvement on land which is associated with a source of air releases or potential air releases of a hazardous material." The Guidelines further state that: "[e]xcept for the oil production operations defined in section X.14(b), for purposes of this regulation, the phrase "every structure, appurtenance, installation" shall mean all equipment, buildings, and other stationary items, or aggregations thereof, (A) which are associated with a source of air emission or potential air emission of a listed substance; (B) which involve activities that belong to the same two-digit Standard Industrial Classification code, or are part of a common operation; (C) which are located on a single site or on contiguous or adjacent sites; and (D) which are under common ownership,

operation, or control, or which are owned or operated by entities which are under common ownership, operation, or control."

US EPA Toxic Release Inventory Program

Facility definition: "An entire facility means all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with such person). A facility may contain more than one establishment."

Table A1. Pearson (P) & Spearman (S) Correlation Coefficient R-Values for Criteria Air Pollutants and GHGs by Industrial Sector. Shaded Boxes Indicate Statistically Significant Correlations.

	Cement Plants		Cogeneration		Hydrogen Plants		Electricity Generation		Oil & Gas Production		Refineries		Other Combustion	
	Р	s	P	S	Р	S	Р	S	P	s	P	s	P	S
со	0.094	0.050	-0.031	0.197	-0.072	0.464	0.262	0.465	0.519	0.073	0.802	0.918	0.318	0.186
NOx	0.877	0.883	0.128	0.363	0.612	0.786	0.472	0.728	-0.026	0.122	0.913	0.921	0.884	0.306
SOx	0.193	0.467	0.211	0.484	0.574	0.771	0.487	0.651	0.265	0.361	0.675	0.797	0.202	0.544
PM	0.785	0.867	0.025	0.220	0.538	0.500	0.699	0.648	0.259	0.184	0.883	0.906	0.414	0.442
PM10	0.748	0.833	0.095	0.294	0.574	0.679	0.711	0.655	0.260	0.190	0.898	0.944	0.509	0.499
PM2.5	0.645	0.817	0.137	0.377	0.608	0.786	0.713	0.663	0.261	0.189	0.908	0.944	0.616	0.598
ROG	0.604	0.467	0.267	0.108	0.547	0.643	0.441	0.439	0.155	0.207	0.833	0.965	-0.003	0.043
TOG	0.525	0.467	0.331	0.148	0.799	0.821	0.556	0.660	0.255	0.271	0.892	0.959	0.075	0.141
VOCs	0.698	0.667	0.267	0.152	0.765	0.714	0.505	0.480	0.155	0.207	0.845	0.956	0.006	0.044

Exhibit 5

The California Environmental Justice Advisory Committee's Declaration in Support of Carbon Pricing Reform in California

Approved by Environmental Justice Advisory Committee by majority vote (6-0, 3 abstained) February 15, 2017

- Whereas, the climate system of the planet and the energy choices we make are inextricably linked to a looming ecological and social catastrophe; and
- 2. Whereas, the United States and all other countries of the world face a moment of great promise and great peril regarding our energy production and use, including: 1) our overdependence on fossil fuels such as oil, natural gas, and coal; 2) the production and use of bio-fuels with dubious sustainability attributes; and 3) the resurgence of domestic and international nuclear power development; and
- Whereas, Asian, Black, Latino, and Native American communities in the United States, as well as
 indigenous and poor people around the world, disproportionately bear the negative economic,
 environmental, and health impacts of the fossil fuel economy at every stage of its life cycle including its
 exploration, extraction, production, refining, distribution, consumption, and disposal of its waste; and
- 4. Whereas, global climate change caused by the entire life cycle of fossil fuels, resulting in the release of carbon dioxide, other greenhouse gases, and associated co-pollutants into our oceans, air, soil, and vegetation jeopardizes the planet's ability to maintain a livable climate and causes grave health problems in poor communities, communities of color, and indigenous communities around the world; and
- 5. Whereas, the international scientific community predicts that climate change will cause great human suffering, the brunt of which will be borne by the world's poor, developing nations, disenfranchised indigenous communities, the infirm, and peoples of color that have been historically discriminated against at global, national, and local levels; and
- Whereas, the best available science indicates that the planet is warming more rapidly than we understood
 when the Kyoto Accord was ratified and that reductions in greenhouse gases must be undertaken more
 quickly and with greater urgency than previously recognized; and
- 7. Whereas, economic globalization steers international commodity markets to manufacture and privatize the "right" to dispose of greenhouse gases and their co-pollutants into the air, oceans, soil, vegetation and human bodies and is in direct conflict with the true human rights of people and respect for our planet; and
- 8. Whereas, his Holiness Pope Francis believes that the "strategy of buying and selling 'carbon credits' can lead to a new form of speculation which would not help reduce the emission of polluting gases worldwide . . [and] in no way does it allow for the radical change which present circumstances require"; and
- Whereas, carbon trading is undemocratic because it allows entrenched polluters, market designers, and commodity traders to determine whether and where to reduce greenhouse gases and co-pollutant emissions without allowing impacted communities or governments to participate in those decisions; and
- 10. Whereas, the political power of the major global polluters has resulted in a carbon trading scheme in California that prevents the public from access to essential facility-specific compliance data, allows gaming of the system by market participants through such practices as resource shuffling, allows for excessive use of out-of-state offsets, and lacks meaningful penalties for failure to comply; and
- 11. Whereas, a recent study of California cap and trade found that many industry sectors increased in-state emissions, environmental justice communities are disproportionately impacted by climate polluters, excessive use of offsets denies environmental justice communities the benefits of on-site reductions, and validates the concerns raised by the environmental justice community after the passage of Assembly Bill 32; and
- 12. Whereas, revenue from the auction of allowances has provided important funding for greenhouse gas emissions reduction projects, and the Environmental Justice Advisory Committee has secured a portion of that revenue to benefit low-income and disadvantaged communities throughout California; and
- 13. Whereas, the California Legislature passed Senate Bill 32 in 2016, which enacted the most stringent climate reduction mandate in the world, requiring a forty percent reduction from 1990 levels by 2030; and
- 14. Whereas, the California Legislature passed Assembly Bill 197 in 2016, which enacted substantial reform to benefit environmental justice communities, including a mandate to the Air Resources Board to prioritize direct emissions reductions in the strategy to achieve the 2030 target; and

- 15. Whereas, the California Air Resources Board has drafted a 2030 Target Scoping Plan that does not reflect best practices in research or serve the interests of poor communities, communities of color, and indigenous communities in California and around the world; and
- 16. Whereas, greenhouse gases from fossil fuels will be substantially reduced only through a transition to greater energy efficiency and sustainable energy technologies that do not rely on fossil fuels; and
- 17. Whereas, capturing energy from the wind, sun, ocean, and heat stored within the Earth's crust builds the health and self-reliance of people and our communities, protects the planet, creates jobs, and expands the global economy; and
- 18. Whereas, greenhouse gases from agricultural sources must be reduced substantially in order to achieve the 2030 target, especially methane emitted by liquefied manure at factory farms; and
- 19. Whereas, sustainable agricultural practices such as pasture-based carbon sequestration presents the opportunity to utilize regenerative farming practices which benefit the climate and rural environmental justice communities; and
- 20. Whereas, global energy transformation is the politically unifying and inclusive principle that affirms the rights of all people -- including the poor, women, rural and indigenous communities -- to have access to affordable and sustainable energy and the enhanced quality of life that such access affords; and
- 21. Whereas, placing an appropriate price on carbon provides further incentives to decrease greenhouse gas emissions while generating revenue.

The California Environmental Justice Advisory Committee DECLARES that the California Cap and Trade system is inequitable and does not reflect the principles of environmental justice; and

The California Environmental Justice Advisory Committee FURTHER DECLARES that we will oppose at every turn all efforts to extend the California Cap and Trade system in California beyond 2020; and

The California Environmental Justice Advisory Committee FURTHER DECLARES that our demands for real changes in the way we make and use energy will not be silenced by promises of money or token adjustments to the fundamentally flawed trading and offsets approach.

The California Environmental Justice Advisory Committee FURTHER DECLARES that it supports a carbon tax, used in combination with direct emissions reductions, as a policy to replace the revenue generating component of Cap and Trade and to benefit environmental justice communities, support clean energy development, fund a just workforce transition to clean energy, invest in communities' capacity and infrastructure to adapt to climate change, and return a substantial portion to the public so that Californians, especially low-income residents, receive financial support during the transition to a clean energy economy.

BE IT THEREFORE, RESOLVED, that the California Environmental Justice Advisory Committee stands with communities around the world in opposition to carbon trading and offset use and the continued over reliance on fossil fuels; and

BE IT FURTHER RESOLVED, that the California Environmental Justice Advisory Committee will support conservation, regulatory, and other measures to address greenhouse gases only if they directly and significantly reduce emissions, require the shift away from use of fossil fuels and nuclear power, and do not cause or exacerbate the pollution burden of poor communities of color in California, as well as in the United States and developing nations around the world; and

BE IT FURTHER RESOLVED, that the California Environmental Justice Advisory Committee will oppose efforts by our state government to extend Cap and Trade, because this program will not reduce greenhouse gas emissions at the pace called for by the international scientific community, it will not result in a shift to clean and sustainable energy sources, it will support and enrich the state's worst polluters, it will fail to address the existing and future inequitable burden of pollution, it will deprive communities of the ability to protect and enhance their communities, and because if our state joins regional or international trading schemes it will further create incentives for carbon offset programs that harm communities in California, the region, the country, and developing nations around the world.

THEREFORE We, the undersigned organizations and individuals, affirm our solidarity with the California Environmental Justice Advisory Committee, poor, and indigenous people around the world.



Letter Late1-Tesla

April 10, 2017

Richard Corey, Executive Officer California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: 2017 Climate Change Scoping Plan Update

Mr. Corey:

I am writing on behalf of Tesla, which now includes SolarCity, to share our comments in response to the 2017 Climate Change Scoping Plan Update released on January 20, 2017. Comments submitted by SolarCity on December 16, 2016, highlighted four outstanding issues that were not addressed in the draft plan. These included 1) the importance of the Integrated Resource Planning (IRP) efforts between state agencies; 2) the need for the electric grid and energy use to adapt to accommodate intermittent renewable generation driven by utility-scale and distributed renewables, including Zero Net Energy (ZNE) homes; 3) the lack of policy structures in place to incentivize the electrification of buildings; and 4) the relevance of referencing the numerous proceedings currently underway at the California Public Utilities Commission (CPUC) that will impact the speed of deployment of distributed energy resources (DERs). While the plan released on January 20, 2017 acknowledges portions of each of these issues, it does not fully address them. Our comments are structured to align with specific sections of the Scoping Plan Update and include a brief discussion of the four outstanding issues mentioned in SolarCity's December submission. Additionally, our comments highlight opportunities for expansion in the transportation sustainability section, and identify areas of alignment with the Environmental Justice Advisory Committee (EJAC) recommendations² and the Local Actions section.

Low Carbon Energy

Under Air Resources Board's (ARB) proposed scenario, Senate Bill (SB) 350 is a key policy strategy for meeting the 2030 target. SB 350 includes the completion of the IRPs where the deployment of DERs such as a solar and storage will play a key role in achieving the 2030 Greenhouse Gas (GHG) emission target for the electricity sector. There are, however, several additional items to consider that could strengthen the proposed scenario as it relates to the energy sector.

• Integrated Resource Planning (IRP)

As indicated in previous comments to the discussion draft, Tesla appreciates the increased reference to the importance of the IRP throughout the Proposed Scoping Plan. As this section points out, the California Energy Commission (CEC) and the CPUC are currently developing guidelines that publicly owned utilities (POUs) and load-serving entities will follow to prepare and submit IRPs.³ Because the results of these processes are largely uncertain at this point, it will be important to continue to closely monitor results coming out of the IRP. Additionally, because there is little enforcement in place to ensure the POUs meet their identified target, ARB

TESLA, INC 3500 Deer Creek Rd, Palo Alto, CA 94304 p 650.681.5000 f 650.681.5200

¹ Tesla, Inc. acquired SolarCity on November 21, 2016.

 ² 2017 Climate Change Scoping Plan Update, Appendix A, available at: https://www.arb.ca.gov/cc/scopingplan/app_a_ejac.pdf
 ³ 2017 Climate Change Scoping Plan Update, p. 86.

should closely collaborate with CEC to ensure progress is being made. SolarCity submitted comments on December 30, 2016 that included recommendations of near-term actions that the CEC could take.⁴

• Deployment of DERs

Under the ongoing and proposed measures for the low-carbon energy section, the IRP and SB 2688 are both referenced, yet there is no mention of other ongoing efforts at the CPUC that are directly related to these processes. While not stemming from SB 350 implementation, the Distribution Resource Plans (DRP), the Integrated Distributed Energy Resources (IDER) proceeding looking at utility business model reform as well as the numerous rate design cases will influence future policy mechanisms that drive the adoption of DERs and can have a direct impact on meeting the 2030 GHG target. The deployment of DERs is an underlying assumption to the goals, commitments and measures referenced in the Scoping Plan. Therefore, we recommend that the low carbon energy section in the Final Scoping Plan more directly acknowledge the multiple CPUC proceedings currently underway.

• Building Electrification

SolarCity's comments on the GHG scenarios and analysis recognize that electrification of buildings presents a large untapped opportunity for reducing GHG emissions and meeting the state's carbon targets. SolarCity recommended that the final Scoping Plan Update also reference the opportunity for pairing grid-enabled electric water heaters with solar Photovoltaic (PV) as a cost-effective strategy to eliminate carbon emissions associated with water heating and facilitate greater integration of PV resources. This recommendation has not been incorporated into the proposed plan. Tesla continues to support its inclusion in the final plan. Additionally, we support the recommendation made by several parties, including the Natural Resources Defense Council (NRDC) and Sierra Club, to include building electrification in the proposed scenario.

Transportation Sustainability

As a major element of the framework under the proposed scenario, ARB includes increasing the stringency of the Low Carbon Fuel Standard (LCFS) by reducing carbon intensity 18% by 2030, up from 10% in 2020. The proposed scenario also includes a mobile source strategy that aims to deliver 4.2 million Zero Emission Vehicles (ZEVs) in California by 2030. Lastly, the Sustainable Freight Action Plan is included in the proposed scenario, targeting deployment of more than 100,000 zero-emission trucks and equipment by 2030. Tesla agrees that all of these measures are key components to meeting the 2030 target. 8

• Low Carbon Fuel Standard

Under the current regulations, utilities earn revenue through the sale of LCFS credits (generated from estimated residential electric vehicle (EV) charging that takes place in their service territories) and return the revenue to EV owners through flat, one-time rebates or annual on-bill credits. By strengthening the LCFS program requirements, ARB can increase the value of LCFS credits and provide greater benefits to drivers of EVs and other clean vehicles. In addition, Tesla believes the following modifications can further support the program's goals and improve the consumer experience:

⁴ SolarCity Comments to CEC, December 30, 2016, available at: https://www.arb.ca.gov/cc/scopingplan/app_a_ejac.pdf http://docketpublic.energy.ca.gov/PublicDocuments/16-OIR-

^{04/}TN215133_20161230T160230_Gina_Goodhill_Rosen_Comments_SolarCity_comment_Lead_Commissione.pdf

SolarCity comments to ARB, Nov. 21, 2016, available at: https://www.arb.ca.gov/lists/com-attach/42-sp2030scenarios-ws-WjxUO10yADIFb1cI.pdf

⁶ NRDC comments submitted to ARB, Nov.21, 2016, available at: https://www.arb.ca.gov/lists/com-attach/43-sp2030scenarios-ws-VDpOJFI3V2cGXwJh.pdf, Sierra Club submitted to ARB, Dec. 16, 2016, available at: https://www.arb.ca.gov/lists/com-attach/43-sp2030scenarios-ws-VDpOJFI3V2cGXwJh.pdf, Sierra Club submitted to ARB, Dec. 16, 2016, available at: https://www.arb.ca.gov/lists/com-attach/43-sp2030scenarios-ws-VDpOJFI3V2cGXwJh.pdf, Sierra Club submitted to ARB, Dec. 16, 2016, available at: https://www.arb.ca.gov/lists/com-attach/52-sp2030disc-dec16-ws-VyRRPIE1UXABdVU0.pdf

⁷2017 Climate Change Scoping Plan Update, p.35.

^{8 2017} Climate Change Scoping Plan Update, p. ES4.

- Accelerate EV adoption with point-of-sale incentives: The majority of prospective EV buyers are not aware of the LCFS rebates due to the fact that the value is not applied at the point of sale. The customer experience can be improved if automakers or dealers can provide these rebates directly to consumers in the showroom, which is broadly accepted as the most effective method to drive EV sales. This approach will drive EV deployment, expand consumer access to the technology and reduce administrative and marketing costs for participating utilities.
- Ensure fairness for consumers who invest in ZEV technology: The current utility programs do not differentiate the rebate amount based on Electric Vehicle Miles Travelled (eVMT) or electric range. As a result, a plug-in hybrid owner will receive the same rebate as a ZEV owner, even if only 4% of the plug-in hybrid's driving is emissions-free, versus 100% for the ZEV. Long-range ZEVs generate the majority of the LCFS credits, yet they do not receive benefits that are commensurate with their contribution to the goals of the LCFS programs. To encourage the adoption of more-capable EVs, utility programs should differentiate between various EV technologies and reward consumers who choose cleaner, long-range ZEV technology.
- Support greater renewable electricity deployment: ARB can further promote greater renewable energy deployment by permitting credit generators to match solar energy generated in California with vehicle charging to earn credits based on a 0 g/mi Carbon Intensity (CI) value. In order to maximize participation under this pathway, ARB should not require the solar installation to always be co-located with the vehicle charging, as long as it can be demonstrated that the renewable electricity can travel through connected transmission lines to the vehicle's location. There is precedent for this approach in the U.S. Environmental Protection Agency's Renewable Fuel Standard pathways for electricity and renewable compressed natural gas.

• 100% Zero Emission Vehicles

Within the proposed Scoping Plan Update, ARB solicits input on additional policies to move toward a goal of achieving 100% ZEV sales in the light-duty vehicle sector. The preliminary list of ideas for achieving this goal that is provided in the Scoping Plan is a good starting point. To expand upon the current list, Tesla suggests adding the following action items:

- Strengthen the Governor's 2012 EV Executive Order, including fleet ZEV requirements: Governor Brown's Executive Order B-16-12 requires that at least 25% of vehicles purchased for vehicle fleets be zero-emission by 2020. This requirement could be increased significantly for example, to 50% by 2020 and 75% by 2025. Other elements of the order could be strengthened as well, including creating a more detailed implementation plan for achieving the goals of getting 1 million EVs on CA roads by 2020 and 1.5 million by 2025.
- o Improve Clean Vehicle Rebate Project (CVRP): The governor's 2016 ZEV Action Plan recommends developing and implementing a long-term strategy for the CVRP that identifies funding needs, income limits and other programmatic changes necessary to meet the 2020 and 2025 ZEV adoption goals. Increasing the rebate amount for battery electric vehicles and expanding the funding for the program would boost EV adoption in the near term. In addition, the state should consider reducing sales taxes, registration fees and local air quality fees for EVs, as recommended in the ZEV Action Plan.
- Create incentives for rental car, car-sharing and ride-sharing companies to invest in EVs: Rental car
 companies, car-sharing companies (like Zipcar), taxi services and ride-sharing companies could
 significantly increase EV use and ownership by converting portions of their fleets to EVs. Not only would
 this increase the vehicle-miles travelled by EVs, but it would also expose significant portions of the

⁹ 2017 Climate Change Scoping Plan update, p.99.

> population to the technology. State incentives such as tax breaks and other monetary incentives could be implemented to motivate these companies to use EVs in the fleets. For example, ARB recently announced a grant solicitation for applicants to implement the Car Sharing and Mobility Options Pilot Project. Future projects could build off of this opportunity. 11

Volkswagen settlement coordination: Under June 2016 settlement with Volkswagen (VW) over VW's emissions control violations, VW agreed to invest \$800 million in CA ZEV infrastructure over a 10-year period. ARB should utilize its auditing capabilities and partnership with VW to ensure that any investments made are cost effective and benefit the public.

Charging Infrastructure

The Scoping Plan Update references the ongoing efforts by the Investor Owned Utilities (IOUs) to increase EV charging infrastructure. Given the need for charging infrastructure referenced throughout the plan, we would like to see a more specific reference to the types of charging infrastructure that is needed. For instance, to meet EV deployment goals in the Scoping Plan, it will be important to deploy Level 2 charging infrastructure in workplaces¹² and multifamily dwellings. Unlike the DC Fast Charging (DCFC) network expansion, it will be difficult for the private sector alone to deploy the critical amount of Level 2 charging infrastructure needed to meet increasing EV driver demand. Therefore, the utilities and the public sector have a critical role to play in helping achieve this target. Charging infrastructure will also be a critical component for Heavy Duty (HD) EVs as these products come to market.

Heavy Duty Vehicles (HDV)

As has previously been reported, Tesla and several other manufacturers are developing zero emission HD trucks that will be ready for commercial use far sooner than ARBs current projections. We believe that ARB should leverage the early progress made in this space in order to meet the emissions reductions goals identified in the Scoping Plan. Under the potential additional action section for transportation sustainability, we propose that regulations be developed to prioritize the ownership and use of HD trucks. One option is to create a ZEV requirement and credit-trading system for HD fleets and operators similar to what was developed for the passenger car sector.

Modifications to ZEV Regulation

As submitted in Tesla's previous comments, ¹³ we continue to be concerned over ARB staff's proposal to delay modifications to the ZEV regulation until 2026. Since the 2012 ZEV rulemaking, the supply of compliance credits has increased by over 350%, severely limiting the regulation's ability to drive an increasing market share of EVs. 14 As a result, traditional automakers have very little near-term motivation to enhance EV product offerings and pursue compelling, mass-market programs. This delays the transition to sustainable transportation and puts California at risk of failing to achieve its 2030 GHG emissions reduction goal. There are two primary levers that ARB can pull to correct the credit oversupply and drive higher volumes of EV deliveries: 1) increase annual credit requirements and 2) reduce credits earned for each EV delivered. ARB could adjust one or both of these levers to achieve the desired market share result.

 $^{^{11}\} https://www.arb.ca.gov/msprog/aqip/solicitations/040417_FY1617CarSharingPilotProjectSolicitation.pdf$

¹² Workplace charging should be defined to include traditional office space locations as well retail and service industry spaces such as shopping centers to ensure employees of all industry types have workplace charging access.

13 Tesla comments to California's midterm review of the Advanced Clean Cars Program, Mar 20, 2017.

¹⁴ CARB reported data shows that pure ZEV credit balances have increased from 76k in Oct 2012 to 345k in Aug 2016.

EJAC Recommendations

Tesla commends the EJAC for the extensive research and community outreach it has undertaken in developing its recommendations. While many of the EJAC's recommendations are compelling and likely needed to reach California's GHG emissions targets for 2030 and beyond, we find that the following recommendations are particularly relevant in their ability to build on existing efforts and provide an opportunity for near-term action:

- Expand rooftop solar in EJ communities, including desert communities. Use brownfields for solar. 15
- Phase out natural gas appliances and technologies and transition to electric and solar thermal technologies. ¹⁶
- Set goals for new and green buildings: all new construction to be ZNE by 2020, with none using natural gas. Include affordable housing buildings in ZNE goals.¹⁷
- Develop incentives, rebates, and financing mechanisms to accelerate equitable access to clean energy technologies in low-income households, apartment buildings, small businesses, and other community-serving facilities such as community centers, churches, health clinics, schools, parking lots, local industry buildings and community-based organizations.¹⁸
- Ensure that there is sufficient infrastructure to support new and current low emission vehicle categories (i.e. bikes, electric vehicles, etc.).19
- Support sufficient charging and refueling stations along freight corridors.²⁰
- Accelerate ownership and access to ZEV technologies (including rebates, infrastructure etc.).²¹

Local Actions

Local jurisdictions have a significant role to play in meeting the state's GHG emissions targets, and can help accelerate the deployment of DERs across communities throughout the state. Of the list of examples of local actions provided in Appendix B, the following are areas local jurisdictions should already be able to focus on today and therefore should be prioritized:

- Streamline permitting and environmental review and reduce fees for small-scale renewable energy systems.²²
- Adopt a community solar program to help realize economies of scale and support residents without appropriate rooftop space to participate in clean energy generation.²³
- Adopt residential and commercial energy conservation, renewable energy, and/or zero net energy ordinances (consider requirements for audits or upgrades at major renovation or time of sale).²⁴
- Require new residential and commercial construction to install solar or be solar ready.²⁵
- Encourage the development of brightfields brownfields that are used to develop solar energy through tax incentives, streamlining, and use of locally-owned land.²⁶
- Provide EV chargers in public spaces.²⁷

¹⁵ Appendix A, p.8.

Appendix A, p.9.

¹⁸ Appendix A, p.12.

¹⁹ Appendix A, p.13.

²⁰ Appendix A, p.14.

²¹ Appendix A, p.15. Appendix A, p. 16
22 Appendix B, p. 1.
23 Id.

²⁴ Appendix B, p.2.

Appendix B, p.2.

Appendix B, p.2.

Appendix B, p.2.

²⁷ Appendix B, p.3.

Along with these priority actions, there should also be a similar focus at the local level on deploying energy storage, which is briefly referenced in the examples list, and identifying opportunities to deploy Level 2 charging infrastructure at local workplaces and multifamily housing units. Additionally, we recommend two further local actions for charging infrastructure: 1) local ordinances to mandate EV-ready parking spaces at new residential and commercial buildings28 and

2) local ordinances to support EV owners who rely on street parking.

Environmental Analysis

Within Appendix F, the Environmental Analysis, there is a section focused on describing Behind-The-Meter (BTM) PV. 29 While the description that follows provides a fair assessment of the current state of solar plus storage, we recommend emphasizing that the deployment of BTM PV plus storage is directly impacted by the types of regulatory Late1mechanisms the CPUC implements between now and 2030. Furthermore, it is correct that residential customers are currently not placed onto Time Of Use (TOU) rates by default. At the same time, this section should also note that TOU rates are now mandatory for residential customers of Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E) who deploy solar PV under the Net Energy Metering (NEM) tariff, and all residential customers of these utilities will be defaulted to TOU rates in 2019.

Tesla-1

Prior to adopting the final version of the 2017 Climate Change Scoping Plan Update, we urge ARB to incorporate our feedback on the existing sections of the report in regards to the low carbon energy and transportation sustainability sectors. We appreciate the opportunity to comment on the 2017 Climate Change Scoping Plan Update, and we looking forward to continuing our partnership with ARB to achieve the state's air quality and emissions reduction goals.

Sincerely,

Ken Morgan Director, Business Development & Government Affairs Tesla

²⁹ Appendix F, p.13.

²⁸ Appendix B, p.3 references a Transportation Management Ordinance which could include such features.



Letter Late2-CCA

April 11, 2017

Rajinder Sahota California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: ARB's Proposed 2030 Scoping Plan Scenario

Dear Ms Sahota,

Coalition for Clean Air (CCA) supports a Scoping Plan Scenario that will ensure California meets its 2030 climate protection standard, while also maximizing opportunities to address long-standing environmental injustices. These outcomes can be best achieved by a suite of measures that: (1) prioritize direct reductions in greenhou2eCCA gas (GHG) emissions from mobile and large stationary sources; (2) integrate air pollution abatement with climate protection actions; (3) supplement direct control measures with an emissions tax system covering GHGs as well as criteria air pollutants and toxic air contaminants; and (4) expand the scope of institutions involved in meeting the 2030 standard beyond state agencies. We appreciate that the Air Resources Board's Proposed 2030 Scoping Plan Scenario ("ARB's Proposed Scenario") incorporates many of the strategies listed above, and emphasizes emission reductions from the transportation sector because it is the largest contributor to climate disruption and poor air quality in California. Nonetheless, CCA cannot support ARB's Proposed Scoping Plan Scenario, mainly because it calls for the continuation of cap-and-trade whereas we oppose emissions trading programs.

Carbon Pricing Mechanism

We agree with ARB that meeting California's 2030 climate protection standard will be more arduous, technologically and economically, without a carbon pricing mechanism to complement direct control measures. However, CCA is opposed to ARB's Proposed Scenario, because it recommends continuing California's cap-and-trade program beyond 2020. Emission-trading schemes like cap-and-trade can limit the impact of mitigating localized pollution burdens and

Late2-CCA-1

800 Wilshire Boulevard, Suite 1010 Los Angeles, California 90017 (213) 223-6860 1107 Ninth Street, Suite 440 Sacramento, California 95814 (916) 527-8048

www.ccair.org



could even exacerbate pollution hotspots in certain communities by facilitating the buying and selling of emission allowances.

Preliminary research has revealed income and racial disparities between the neighborhoods located near large-emitters (of GHGs and particulate matter) that saw an increase in emissions compared to facilities where emissions decreased over the same time period. Accordingly, cap-and-trade might worsen environmental injustices and including such a program in ARB's Proposed Scenario would run counter to the equity-oriented objective listed in the Draft Environmental Analysis (Objective 9, Appendix F). If ARB decides to extend cap-and-trade post-2020, the agency must redesign the program and pursue revisions identified in the Proposed Scenario, including, but not limited to eliminating or reducing the offset usage limit and the rate of free emission allocations to covered entities. ARB should also explore requirements on the location of offsets, such as mandating these projects occur in neighborhoods near covered facilities or in disadvantaged communities (DACs) in California. CCA also strongly agrees with the need for corrective action if criteria and toxic emissions increase at a covered facility, such as reduced an entity's allowances.

Late2-CCA-1 cont'd

CCA favors a pricing mechanism similar to the cap-and-tax scenario described in Alternative 4, and appreciates that this type of program was analyzed in ARB's latest Scoping Plan document. To be more specific, CCA proposes a system that places a fee on emissions of greenhouse gases as well as criteria and toxic air pollutants. A cap on emission levels should accompany a fee, because a cap provides assurance that California will meet the 2030 climate protection standard while a fee or tax offers regulated entities greater certainty in the price of emission reduction compared to the allowance price under cap-and-trade auctions. CCA believes that Assembly Bill 197 (Eduardo Garcia, 2016) gives ARB the authority to explore and potentially pursue an emissions cap-and-fee (or cap-and-tax) system, because that kind of measure furthers the intent of the law to integrate the State's strategies for mitigating air and climate pollution.

Capping and placing a fee on air and climate pollutants would also bolster California's efforts to achieve deep reductions in emissions to meet federal, health-based air quality standards and generate revenue for incentive funding at the scale required to transform California's transportation, industrial, and energy sectors. Revenue from an emissions fee could and should be deposited into the Greenhouse Gas Reduction Fund and adhere to state laws regarding equitable climate investments within and benefiting disadvantaged and low-income communities (i.e., SB 535 and AB 1550). While cap-and-trade has been in place for a few years, a cap-and-fee system may be simpler and less costly for ARB to administer, and the agency should consider this issue when weighing the advantages of different Scoping Plan scenarios.

800 Wilshire Boulevard, Suite 1010 Los Angeles, California 90017 (213) 223-6860 1107 Ninth Street, Suite 440 Sacramento, California 95814 (916) 527-8048

www.ccair.ora



Industry Sector Measures

CCA firmly supports a refinery measure along the lines of the one in ARB's Proposed Scoping Plan Scenario. This kind of measure presents an excellent opportunity for climate policy to complement efforts to improve air quality and public health due to the strong correlation in emissions of greenhouse gases, criteria air pollutants, and toxic air contaminants at refineries. Second, because refineries are often sited near disadvantaged communities, this measure could help direct attention to the long-standing environmental injustices associated with this type of large-scale industrial facility. ARB and local air districts must ensure community-based organizations (CBOs) have the means to actively participate in the rule-making process as this measure is developed and various regulatory pathways are examined. That is because the Californians most harmed by refineries deserve to help establish the intended outcomes of this measure as well as strategies and trade-offs involved.

CCA also supports many of the efforts identified by ARB to reduce greenhouse gas emissions from the industrial sector, such as increased deployment of renewably-powered fuel cells and Best Available Retrofit Control Technology mandates for large stationary sources beside refineries (e.g., food processors and cement plants). Fluorinated gases, or F-gases, are also critically important to control, because this is the fastest-growing stock of greenhouse gases and they have the highest global warming potential among GHGs. ARB should enact regulations on the sale or distribution of F-gases in California as described in its Proposed Scoping Plan document, and funding should be developed for an incentive program to replace F-gases in air conditioning and refrigeration systems across the state.

Transportation Sustainability

CCA is a strong proponent of all the ongoing and proposed Transportation Sustainability measures listed by ARB in its latest 2030 Scoping Plan document. We are especially supportive of raising the Sustainable Communities Strategies targets that California's metropolitan planning organizations (MPOs) must meet by 2035; please see the comments from ClimatePlan for more details on this and other land use-related measures. Additionally, CCA suggests two changes to other measures listed under *Vibrant Communities & Landscapes/VMT Reduction*.

First, ARB should add Regional Transportation Plan (RTP) Guidelines to the list of programs that state agencies will assist regional governments implement. The updated RTP Guidelines (adopted by the California Transportation Commission in January 2017) include several new references to advanced freight transportation technologies, and encourage MPOs to plan for and invest in infrastructure to support transportation electrification. Some MPOs have conducted plug-in electric vehicle (PEV) regional readiness plans already, with funding from the California

800 Wilshire Boulevard, Suite 1010 Los Angeles, California 90017 (213) 223-6860 1107 Ninth Street, Suite 440 Sacramento, California 95814 (916) 527-8048

www.ccair.ora



Energy Commission (CEC); however, MPOs need additional technical and financial resources to help facilitate the widespread electrification of freight and other heavy-duty vehicles.

Second, the measure regarding ARB's SB 350 study on barriers to ZE/NZE transportation options should explicitly call for implementation of recommendations identified in the report. Based on our positive experiences with this research project, including engagement with low-income and disadvantaged communities, this measure should also state an ongoing commitment to update the study periodically. These suggestions, which ARB may have committed to already, would send an important signal to underserved Californians that the agency is committed to removing barriers they face in accessing cleaner transportation choices. Moreover, transforming California's transportation systems to reach the State's energy and environmental goals will become more viable when the most disadvantaged households and neighborhoods have greater access to clean vehicles and other low carbon mobility options.

As stated previously, CCA supports the ongoing and proposed measures advancing clean vehicle technology and transportation fuels. Setting high standards for the penetration of advanced clean cars and low carbon freight transport and equipment in the California market is especially critical to continue improving the technology and lowering costs, at a time when federal agencies are backsliding on their responsibilities. Reducing emissions from transportation fuels and sustaining the market for low carbon fuels are also key elements of California's strategy to improve air quality, public health, and meet the State's ambitious 2030 climate protection standard. That is why it is crucial for ARB to extend the Low Carbon Fuel Standard (LCFS) past 2020, strengthen the LCFS to achieve an 18 to 25 percent reduction in carbon intensity by 2030, and begin adopting regulations to increase the recovery in California of renewable sources of natural gas (RNG) to fuel heavy-duty vehicles and equipment. While CCA supports greater in-state generation of low carbon transportation fuels, ARB must take steps to prevent, or at least minimize, the negative impacts of fuel production and distribution on communities living near such facilities. For instance, policymakers should safeguard against a concentration of Natural Gas and other fueling depots (even if the fuels are low carbon) in disadvantaged communities, because it would lead to increased truck traffic and attendant problems in areas already facing high cumulative environmental impacts.

Late2-CCA-2

ARB should also pursue the potential additional actions identified in its latest Scoping Plan document in order to achieve deep reductions in mobile source emissions. Developing a Low Emission Diesel Standard is urgently needed in order to make significant progress in the near-term on climate, air quality, and public health, while zero-emission technologies are developed for the heaviest-duty trucks and equipment types for which a zero-emission alternative does not yet exist. On the light-duty side, the policies listed to support 100 percent zero-emission vehicle

800 Wilshire Boulevard, Suite 1010 Los Angeles, California 90017 (213) 223-6860 1107 Ninth Street, Suite 440 Sacramento, California 95814 (916) 527-8048

www.ccair.ora



(ZEV) sales in California eventually are credible strategies for enhancing the desirability of ZEVs to consumers and accelerating market demand. ARB's SB 350 study will hopefully generate other, more specific policy ideas to ensure the transformation of the light-duty vehicle market is inclusive of low-income and disadvantaged community residents. In addition to supporting advanced technology vehicles, CCA agrees with the recommendation from Energy Solutions to establish standards on the rolling resistance of replacement tires sold in California. This potential new measure is projected to yield more than two million metric tons of GHG emission reductions annually, and deliver important air quality and cost-saving benefits to lower income car-owners who are more likely to be driving on replacement tires.

Just Transition

CCA agrees with and supports the Environmental Justice Advisory Committee's recommendation to begin planning for a just transition for incumbent workers in fossil fuel industries. Over time, these workers are likely to face a greater risk of unemployment due to changes in business operations or reductions in output to meet climate and clean air obligations. In addition to issues of fairness and equity, a just transition could yield environmental benefits if incumbent workers' accumulated knowledge and skills are leveraged in closely related occupations and industries that are aligned with a low carbon economy. California has proven that environmental protection and economic growth can be coupled and with great success on both fronts, and now is the time to ensure this extends to employment and people's livelihoods.

Sincerely,

S. Jathan

Shrayas Jatkar, Policy Associate Coalition for Clean Air



Richard Corey, Executive Officer California Air Resources Board 1001 I Street Sacramento, CA 95812-2828

RE: Southern California Edison Comments on the Scoping Plan Update - CEQA Analysis

Mr. Corey,

Southern California Edison (SCE) respectfully submits these comments to the California Air Resources Board (CARB) on the Environmental Analysis of the Scoping Plan Update (Proposed Plan), and comments on the Draft Scoping Plan Scenario (Proposed Scenario) described in this Proposed Plan.

SCE supports the general structure of the Proposed Scoping Plan Scenario, and a well-designed Cap-and-Trade program to help the state achieve its post-2020 climate goals. A well-designed Cap-and-Trade Program can help keep total scenario costs down while encouraging innovation and achieving environmental goals. SCE therefore supports the general structure of the Proposed Scenario, which includes this important mechanism. The Environmental Analysis and recently released Economic Analysis further support the CARB Proposed Scenario as the best of all considered alternatives.

Late 3-SCE-1

SCE believes the Electric Sector can help other sectors decarbonize, and therefore supports widespread electrification and fuel-switching. SCE supports widespread electrification and recognizes fuel switching will be necessary to achieve many of the air quality and greenhouse gas (GHG) goals the state has laid out in the Proposed Scoping Plan Scenario. We look forward to bringing proposals to our regulatory agencies that highlight where SCE can help the state achieve its goals, and bolster the success of electricity in penetrating these new applications and markets.

SCE supports the inclusion of building electrification targets in the Scoping Plan, recommended by the building electrification stakeholder group in its letter during this public comment period^[1]. The joint stakeholder group's letter includes three primary recommendations related to building electrification, which SCE urges CARB to amend the Proposed Scoping Plan to include, specifically:

- Establish state-wide targets in the Proposed Scenario, as previously included in the Alternative 1 scenario, for electrifying space and water heating in residential and commercial buildings in 2020-2030:
- Conduct analysis on the timeline, pathway, and barriers to achievement of building decarbonization targets; and,
- Identify activities that can be taken to spur market transformation and deployment in order to achieve above targets.

^[1] Consisting of Sierra Club, Natural Resources Defense Council, Solar Energy Industries Association, Marin Clean Energy, Build It Green, Local Government Sustainable Energy Coalition, Association of Bay Area Governments, Bay Area Regional Energy Network, Carbon Free Palo Alto, Redwood Energy, and Design AVEnues, SMUD

This Scoping Plan Update process will be critically important for utility planning, in a way that no Scoping Plan has before. Upon completion of this public rulemaking process, the final Scoping Plan will set the range of GHG emissions that the state wishes to see come from the electric sector out to 2030. This range will likely be taken by the CPUC and used to inform the electric utilities' Integrated Resource Plans as required by SB350. It is also important that any electric sector GHG 'range' be informed by a high electrification scenario, similar to the "HIGH BEV" Scenario in the State Agency Pathways Modeling project as SB350 requires electric utilities to accelerate the electrification of transportation and of other end uses. While this recommendation is not directly material to the CEQA Analysis, SCE believes that further efforts to promote electrification could alter the emission outcomes across sectors, but will almost assuredly result in a reduction in overall state-wide GHG emissions.

Late3-SCE-1

Thank you for your time, and consideration of the comments presented in this letter. Sincerely,

Dawn Wilson Director, Environmental Affairs and Sustainability

Dam Wilson



LOS ANGELES CO
SOLID WASTE MANAGEMENT COMMIT
INTEGRATED WASTE MANAGEMENT TASK FO
900 SOUTH FREMONT AVENUE, ALHAMBRA, CALIFORNIA 91803-1331
P.O. BOX 1460, ALHAMBRA, CALIFORNIA 91802-1460
www.lacountyjswmtf.org

October 17, 2017

Ms. Mary Nichols, Chair California Air Resources Board (CARB) 1001 | Street Sacramento, CA 95814

Dear Ms. Nichols:

COMMENTS ON THE OCTOBER 12, 2017 PUBLIC WORKSHOP ON THE 2017 SCOPING PLAN UPDATE - THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA'S 2030 GREENHOUSE GAS TARGET

The Los Angeles County Solid Waste Management Committee/Integrated Waste Management Task Force (Task Force) would like to express its appreciation to the California Air Resources Board (ARB) for the opportunity to provide comments on the October 12, 2017 Public Workshop on "The 2017 Climate Change Scoping Plan: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target" (Proposed Plan).

https://www.arb.ca.gov/cc/scopingplan/meetings/101217/sp-october-workshop-slides.pdf

Pursuant to Chapter 3.67 of the Los Angeles County Code and the California Integrated Waste Management Act of 1989 (Assembly Bill 939, as amended), the Task Force is responsible for coordinating the development of all major solid waste planning documents prepared for the County of Los Angeles and the 88 cities in Los Angeles County with a combined population in excess of ten million. Consistent with these responsibilities and to ensure a coordinated, cost-effective, and environmentally sound solid waste management system in Los Angeles County, the Task Force also addresses issues impacting the system on a countywide basis. The Task Force membership includes representatives of the League of California Cities-Los Angeles County Division, County of Los Angeles Board of Supervisors, City of Los Angeles, the waste management industry, environmental groups, the public, and a number of other governmental agencies.

The Task Force has several recommendations to include in the Full Final Scoping Plan (Final Plan) and Final Environmental Analysis (Final EA) to be released in November 2017:

Ms. Mary Nichols October 17, 2017 Page 2 of 6

General Comments:

 The Final EA or Final Plan should quantify and compare the emissions, health, and economic impacts of different end uses of organic waste, including biofuels, electricity, pipeline biogas, and compost.

7-1

• The Proposed Plan supports biomass conversion, anaerobic digestion (AD), composting, and recycling. While these technologies will increase diversion from landfills and reduce greenhouse gas (GHG) emissions, they are limited to processing only certain types of waste. Furthermore, not all materials can feasibly be recycled. Conversion technologies (CTs) are a wide array of non-combustion thermal, biological, and chemical technologies capable of converting post-recycled residual solid waste into renewable energy, renewable fuels, and/or useful products. The conversion of post-recycled municipal solid waste (MSW) is essential to achieve the goals identified in the Proposed Plan, such as maximizing diversion from landfills, developing a sustainable, low-carbon waste management system, and mitigating climate impacts beyond 2050.

Therefore, the Final Plan should be expanded to include the development of CT facilities as part of the goals to reduce GHG emissions from the Waste Management sector given their capability to handle a wide variety of wastes for which other processes, such as AD, composting, and recycling, may not be suitable. The Proposed Plan should also be expanded to include specific actions the State will take to facilitate the development of alternatives to landfills, including CTs, in addition to biomass conversion and AD.

Furthermore, the Final Plan should consider and encourage all available technologies that can reduce GHGs from organic waste disposal, and not limit the alternative technologies to composting and AD only. Due to the recent passage of legislation such as Senate Bill 1383 (Lara, Chapter 395 of the 2016 State Statutes), which sets ambitious goals for organic waste disposal reduction, CalRecycle needs to look beyond these two processes to thermal CTs in order to significantly increase the rate of organic waste recycling and reduce GHG emissions from the Waste Management sector.

Specific Comments on the Proposed Plan:

On page ES2 of the Proposed Plan a reference has been made to "a recent State report which noted among other observations that "spring runoff volumes are declining as a result of diminished snowpack." The Task Force would appreciate being provided with a list of assumptions and analyses that were used by the State report to develop the list of observations noted. In addition, considering the amount of snow that the State has received this year, what impact(s) should one expect on the findings of the subject State study and why?

Ms. Mary Nichols October 17, 2017 Page 3 of 6

- On page ES6, paragraph 4 of the Proposed Plan a statement has been made that "to date, over \$3 billion has been appropriated from the Greenhouse Gas Reduction Fund [GGRF], with approximately one third of the funding targeted to benefit disadvantaged communities." The Task Force strongly applauds this action by ARB. Although there has been some allocation of the GGRF for the development of needed organic solid waste management infrastructure in Los Angeles County and the surrounding region, much more investment is needed to develop sufficient organic waste processing infrastructure.
- The discussion on Transportation Sustainability (pages 98 to 108) emphasizes the need to transition the State's transportation system to one powered by zero emission vehicles (ZEVs) and low carbon fuels. On page 103, there is a specific goal to reach 100 percent ZEV sales without any specific goal for low carbon fuels or near zero emission vehicles using carbon negative fuels. The development of low carbon fuels, such as biofuels, should have a specific goal and be prioritized over ZEVs in the Final Plan. ZEVs have upstream emissions whereas biofuels can be produced with a negative carbon intensity (emphasis added).
- The goals of the Proposed Plan for the Waste Management sector (page 122) should be expanded to include conducting a lifecycle and cost-effectiveness study of emission reduction strategies for the solid waste sector (emphasis added). This would allow ARB to develop specific programs and policies that are most effective in reducing GHG emissions from the solid waste sector. An example would be to include a lifecycle comparison of different end uses of organic waste (biofuels, electricity, pipeline biogas, and compost) including carbon and water savings from different soil amendments and the cost effectiveness of GHG reductions per ton of CO2e reduced for different organic waste diversion strategies.
- The Proposed Plan contains numerous goals for reducing GHG emissions.
 The Final Plan should be expanded to include a more detailed discussion of the
 specific actions that would be implemented to achieve the Plan's goals, such as
 measures to:
 - Increase organics markets which complement and support other sectors (page 122). The expanded discussion on organics markets should emphasize that a lack of organics markets has increased GHG emissions by causing more organic wastes to be disposed in landfills. The discussion should also need to consider the amount and type (woody, green, or other) of organics generated throughout the year.

The discussion should specify where recycled/diverted organic materials for which there are no or insufficient markets will be stored. The discussion

Ms. Mary Nichols October 17, 2017 Page 4 of 6

should also address how much space will be needed for storage of these materials if they cannot be put on the market immediately.

Organic material stored in piles can generate heat that could potentially cause fires and can also release GHGs. The discussion should also consider how storage of organic materials will comply with regulations by other State regulatory agencies besides CalRecycle, such as the California Department of Food and Agriculture and the California Department of Forestry and Fire Protection. Furthermore, the discussion should analyze the impacts of increasing organics markets based on region. Throughout the State, the production of and demand for organic products varies greatly based on region.

 Resolve issues of pipeline injection of bio-gas and grid connection to make renewable energy projects competitive (page 124).

Specific Comments on the Draft Environmental Analysis (Draft EA):

 In describing the impacts of known commitments [beginning on page 12 of the Draft EA, the Final EA should compare the environmental impacts, including life-cycle GHG emissions, of the use of low carbon fuels as part of the Low Carbon Fuel Standard with the use of zero emission vehicles (ZEVs) as part of the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy.

7-2

• Zero emission vehicles (ZEVs) use lithium batteries. As stated in the Draft EA, the increased use of ZEVs will result in an increased need for lithium battery manufacturing and recycling (page 23). Low-nitrous oxide (NOx) engines fueled by renewable natural gas (RNG) produced from solid waste will result in greater GHG reductions without producing additional hazardous waste in the form of batteries. For certain vehicle types, low-NOx engines using RNG may be a more effective than ZEVs for reducing GHG emissions. In the description of measures under the Mobile Sources Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy, the Final EA should include a description of the benefits of using low-NOx engines for vehicles such as on-road heavy-duty vehicles (page 18).

7-3

In the Draft EA, methane reduction measures under the SLCP Strategy (described
on pages 61 and 97) and fugitive methane emissions reduction measures
(described on page 151) include AD and composting. The methane reduction
measures need to include thermal CT facilities. Thermal CTs are able to handle a
wide variety of wastes, such as contaminated recyclables, medical waste,
hazardous waste, or mixed materials such as goods made of more than one type
of plastic, for which other processes, such as AD, composting, and recycling, may
not be suitable.

7-4

Ms. Mary Nichols October 17, 2017 Page 5 of 6

> As stated in the Draft EA, the implementation of the Proposed Plan could result in an increased rate in turnover of vehicle fleets to increase the use of zero-emission technologies (page 149). The Draft EA also states that these vehicles would need to be recycled or shipped for use outside of California (page 150). The Final EA should include a statement that the use of RNG produced from solid waste will result in greater GHG reductions and produce less waste from existing fleets being replaced by ZEVs.

7-5

We respectfully request that the above comments/issues be addressed in the Final EA. The Task Force would be pleased to participate in future stakeholder opportunities related to this Plan. Should you have any questions regarding these comments, please contact Mr. Mike Mohajer, a Member of the Task Force, at MikeMohajer@Yahoo.com or at (909) 592-1147.

Sincerely,

Margaret Clark
Margaret Clark, Vice-Chair

Los Angeles County Solid Waste Management Committee/

Integrated Waste Management Task Force and

Council Member, City of Rosemead

KV:mo

P:\eppub\EnvAff\ENVAFF\TF\TF\Letters\2017\TF Comments on Scoping Plan 10.17.17.doc

cc: Scott Smithline and Howard Levenson, CalRecycle (Waste)

Kevin Barker, Pamela Doughman, and Michael Murza, California Energy Commission (Energy)

Jack Kitowski, California Air Resources Board (Transportation)

Amrith Gunasekara, California Department of Food and Agriculture (Agriculture)

Steven Moore, California State Water Resources Control Board (Water)

David Mallory and Shelby Livingston, California Air Resources Board (Natural Resources)

League of California Cities

League of California Cities, Los Angeles County Division

California State Association of Counties

Each Member of the County of Los Angeles Board of Supervisors

Each City Mayor/Manager in the County of Los Angeles

South Coast Air Quality Management District (Wayne Nastri)

South Bay Cities Council of Governments

San Gabriel Valley Council of Governments

Gateway Cities Counsel of Governments

Strategy for Achieving California's 2030 GHG Target Response to Comments

Appendix A - Comment Letters

Ms. Mary Nichols October 17, 2017 Page 6 of 6

Southern California Association of Governments (Frank Wen)
Each City Recycling Coordinator in Los Angeles County
Each Member of the Los Angeles County Integrated Waste Management Task Force
Each Member of the Alternative Technology Advisory Subcommittee
Each Member of the Facility Plan Review Subcommittee



Letter Late 8

November 22, 2017

Mary Nichols, Chair And Board Members of the California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

Re: Scoping Plan and decarbonization issues

Dear Chair Nichols and Board Members:

We are writing on behalf of Sierra Club to urge that you take action at December's board meeting to address two concerns about the Revised Draft of the Updated Greenhouse Gas Scoping Plan ("Revised Plan"). Specifically, our concerns are that the document falls short of calling for the needed policy changes to accelerate the electrification of the existing building stock in California. Additionally, the document overstates the role of "renewable natural gas" in decarbonizing buildings. The gas industry is currently using the draft language in the Scoping Plan to delay action at the state agencies to electrify buildings.

To achieve California's greenhouse gas reduction and air quality goals, state agencies must establish a comprehensive plan to transition the state's 13 million homes and buildings away from dependence on natural gas for space and water heating, and toward less polluting and climate-friendly *electric* options. We submitted a comment letter on the Updated GHG Scoping Plan on April 10, 2017 with 10 stakeholder groups that outlines the need to establish an action plan to decarbonize buildings in line with the state's climate goals. IBEW-NECA and Southern California Edison submitted similar comments to this coalition letter.

The Revised Scoping Plan should more clearly indicate the need to transition to building electrification. We support the building decarbonization actions identified in the Revised Plan that call for agencies to set building electrification targets, spur market transformation, prioritize low income homes, decrease usage of gas in buildings, and accelerate deployment of electric heat pumps. However, these "next steps" are relegated to the "Potential Additional Action"

8-1

909 12th Street, Suite 202, Sacramento, CA 95814 (916) 557-1100 • Fax (916) 557-9669 • www.sierraclubcalifornia.org

¹ Revised Scoping Plan: "Through a public process, evaluate and set targets for the electrification of space and water heating in residential and commercial buildings and cleaner heating fuels that will result in GHG reductions, and identify actions that can be taken to spur market transformation in the 2021-2030 period. Expand the State Low-Income Weatherization Program (LIWP) to continue to improve energy efficiency and weatherize existing residential buildings, particularly for low-income individuals and households. Decrease usage of fossil natural gas through a combination of energy efficiency programs, fuel switching, and the development and use of renewable gas in the residential, commercial, and industrial sectors. Accelerate the deployment of heat pumps and the replacement of diesel generators." (pdf p. 107-108)

category. This suggests that these important actions are options rather than necessities. Rather, the steps should be listed as a central strategy to deeply decarbonize buildings and be accompanied by deadlines for implementation.

8-1 cont.

The Revised Draft Scoping Plan overstates the potential of "renewable natural gas" to reduce pollution from the building sector. The Scoping Plan identifies renewable natural gas as a primary solution to power end uses in buildings that currently rely on conventional natural gas, such as water and space heating and cooking:

8-2

For end uses that must continue to rely on natural gas, renewable natural gas could play an important role. Renewable natural gas volume has been increasing from approximately 1.5 million diesel gallon equivalent (dge) in 2011 to more than 68.5 million dge in 2015, and continued substitution of renewable gas for fossil natural gas would help California reduce its dependence on fossil fuels. In addition, renewable gas can be sourced by in-vessel waste digestion (e.g., anaerobic digestion of food and other organics) and recovering methane from landfills, livestock operations, and wastewater treatment facilities through the use of existing technologies, thereby also reducing methane emissions. The capture and productive use of renewable methane from these and other sources is consistent with requirements of SB 1383." (pdf p.103)

This and other references to "renewable natural gas" do not reflect the limited supply or the air quality and environmental impacts of biomethane.

- Limited supply: The potential supply of biomethane in California is limited and would meet only a fraction of California's energy needs. Union of Concerned Scientists notes that analysis from the National Renewable Energy Laboratory shows that the amount of biomethane potentially available in California could meet only 3 percent of California's existing demand for natural gas across all sectors.² Additionally, as SB 1383 is fully implemented, biomethane potential in California may decrease even further. That law directs the development of a comprehensive strategy to address the problem of short-lived climate pollutants (SLCP), including both steps to reduce the original problem (directing the diversion of organic waste from solid waste streams and improving manure management practices) as well as steps to incentivize productive use of the resulting emissions (considering a market for biomethane).
- Air quality impacts: While anaerobic digesters can reduce methane emissions from manure waste between 25 and 40 percent, they do so in a manner that worsens air quality. The resulting digestate from anaerobic digesters typically has increased ammonia levels by 81 percent over what raw, unprocessed manure would contribute.³ Ammonia is a

83

 $\underline{http://www.ucsusa.org/sites/default/files/attach/2017/05/Promises-and-limits-of-Biomethane-factsheet.pdf}$

² UCS, The Promises and Limits of Biomethane,

³ CRPE comments in CEC IEPR docket, Michael A. Holly, et al., Greenhouse gas and ammonia emissions from digested and separated dairy manure during storage and after land application, *Agriculture, Ecosystems and Environment* 239 (2017) 410-419, 416.

precursor to fine particulate matter, and nitrous oxide can significantly impact local air quality.

8-3 cont.

Environmental impacts: Union of Concerned Scientists appropriately cautions, "It is
important to note that once biomethane is generated and injected into a natural gas
pipeline, its environmental impacts parallel those of natural gas. Small leaks throughout
the natural gas distribution system, and catastrophic leaks such as the one in Aliso
Canyon, can erode any climate benefits associated with using methane as a fuel."4

8-4

The gas industry is currently using the draft language in the Scoping Plan to delay action at the state agencies to electrify buildings. Southern California Gas Company (SoCalGas) repeatedly quotes the Draft Scoping Plan in regulatory filings at the California Energy Commission (CEC) and California Public Utilities Commission (CPUC) to block or delay the electrification of residential and commercial buildings. At the CPUC, SoCalGas quoted the Draft Scoping Plan to oppose any update to the "Three- Prong Fuel Substitution Test" that is used to award energy-efficiency funding to home energy upgrade projects. In its opposition, SoCalGas said the test should not be revised to allow for funding for fuel substitution because CARB did not identify electrification as necessary to achieve climate goals. Similarly, at the CEC, SoCalGas quoted the Draft Scoping Plan to state that electrification is not needed to achieve climate or SB 350 energy efficiency goals, and that the only "fuel switching" that is needed is gas to "renewable gas", not gas to electric.

8-5

The language in the Final Scoping Plan has consequences, both for agency-wide action and as a signal to the market. We urge the Air Resources Board to seize this timely moment to ensure that the Final Plan shows bold leadership.

We ask the board to instruct staff to amend the Scoping Plan so that the final version:

- Clearly identifies electrification, not "renewable natural gas," as the key strategy to deeply decarbonize buildings; and,
- Calls for agencies to accelerate building electrification via aforementioned "next steps" with specific deadlines.

Thank you for your consideration of this request.

Sincerely,

Kathryn Phillips Director Sierra Club California

Rachel Golden Senior Campaign Representative Sierra Club

 $\underline{http://www.ucsusa.org/sites/default/files/attach/2017/05/Promises-and-limits-of-Biomethane-factsheet.pdf}$

⁴ UCS, The Promises and Limits of Biomethane,

Letter FebEJAC

JOINT MEETING
STATE OF CALIFORNIA
AIR RESOURCES BOARD

AND

ENVIRONMENTAL JUSTICE ADVISORY COMMITTEE

CALEPA HEADQUARTERS

COASTAL HEARING ROOM

SECOND FLOOR

1001 I STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, FEBRUARY 15, 2017 1:38 P.M.

JAMES F. PETERS, CSR CERTIFIED SHORTHAND REPORTER LICENSE NUMBER 10063

APPEARANCES

BOARD MEMBERS:

Ms. Mary Nichols, Chair

Ms. Sandra Berg, Vice Chair

Dr. John Balmes

Mr. Hector De La Torre

Mr. John Eisenhut

Supervisor John Gioia

Ms. Judy Mitchell

Mrs. Barbara Riordan

Supervisor Phil Serna

Ms. Diane Takvorian

ENVIRONMENTAL JUSTICE ADVISORY COMMITTEE MEMBERS:

Dr. Martha Dina Argüello

Mr. Colin Bailey

Ms. Gisele Fong

Mr. Tom Frantz

Ms. Katie Valenzuela Garcia

Mr. Kevin Hamilton

Mr. Luis Olmedo

Ms. Kemba Shakur

Ms. Mari Rose Taruc

Ms. Eleanor Torres

APPEARANCES CONTINUED STAFF: Mr. Richard Corey, Executive Officer Dr. Alberto Ayala, Deputy Executive Officer Ms. Edie Chang, Deputy Executive Officer Mr. Kurt Karperos, Deputy Executive Officer Ms. Ellen Peter, Chief Counsel Ms. Emily Wimberger, Chief Economist ALSO PRESENT: Mr. Michael Boccadoro, Dairy Cares Mr. Brent Newell, Center on Race, Poverty & the Environment Mr. Sean Penrith, Climate Trust Ms. Shelly Sullivan, Climate Change Policy Coalition Mr. Tim Tutt

	I N D E X	PAGE
1.	Welcome and Introductions	rage 1
2.		_
2.	Discuss EJAC Recommendations	35
	a) Overarching b) Energy, Green Buildings & Water c) Industry	35 57 86
3.	Public Comment	111
	d) Transportation e) Natural and Working Lands	116 130
3.	Public Comment	145
4.	Discuss Options for Addressing the EJAC's Recommendations	148
5.	Closing Remarks	181
Adjournment		187
Reporter's Certificate		188
1		

```
1
                       PROCEEDINGS
1
2
            MODERATOR LUCERO: We're going to be starting
    shortly. If we could stop the side conversations. If you
3
    do have a pressing conversation, please take it outside.
4
5
    It makes it very difficult for those in the room to hear
6
    each other.
7
             So for our Air Resources Board Member and our
8
   Environmental Justice Advisory Committee members, we do
9
   have name tags for your seats. Most of you have found
    your spots. We have a couple people filtering in, but
10
    we've got a lot to discuss. We want to make sure we start
11
12
   moving.
             Before we commence any further, our emergency
13
    announcement.
14
15
             STAFF AIR POLLUTION SPECIALIST JOHNSON: In the
16
    event of an emergency, we need to exit down the stairs and
    out the building to the park across the street and then
17
18
   we'll wait for the all-clear signal when we're -- when
    that's given, we can come back to the room to resume the
19
20
   meeting.
21
             There are water fountains and restrooms that
    way(indicating).
22
23
             EJAC MEMBER BAILEY: What if the emergency is a
    flood?
24
25
             (Laughter.)
```

2 MODERATOR LUCERO: Boats will be provided by 1 Water Board. 2 All right. So thank you all for joining us 3 today. As you can see from our agenda, we have a lot of 4 5 discussions and we want to make sure we get through this 6 very quickly. My name is Stephanie Lucero, Center for 7 Collaborative Policy. I am here to guide our train and 8 make sure we have the ample time to talk and have the 9 discussions highlighted and keep on schedule. So really quickly, welcome and introductions. We 10 will be doing welcome and introductions with Air Resources 1 1 Board members and our Environmental Justice Advisory 12 Committee members, EJAC for short. 13 And we are requesting that EJAC members provide 14 15 your name, the group that you're with and just some of the 16 main issues that you're seeing on the ground. And for our Air Resources Board members, if you can provide your name 17 18 obviously, your region, and a little bit of history that you have with cap and trade and/or the AB 32. 19 20 Give then, we're trying to have these 21 announcements about a minute or less. So succinct. want to make sure we have plenty of time for the discuss 22 EJAC Recommendations, which will have a little bit of 23 introduction for each of the sectors from our EJAC 24

J&K COURT REPORTING, LLC 916.476.3171

members, but really that is intended to be a discussion

25

```
3
    with the group.
 2
             I'll be giving you some time checks so that we
    can make sure we get through all the sectors. And we'll
 3
    work from there together to get through all of them. We
 4
 5
    will have a some time for public comment, which I will
 6
    explain in a little bit.
 7
             And then we'll be discussing options for
8
    addressing the EJAC's recommendations with the Board, and
 9
    then we'll be doing closing remarks.
             For the public that is joining us, thank you for
10
    being here today. We do have public comment. If you are
11
    interested in providing public comment, please fill out
12
    one of the forms in the back. Rana is raising her hand.
13
    She can help you with that. I will take those and
14
15
    provide -- provide the time during public comment based on
16
    how many we have. We're looking at a 1 to 2 minute max
    inn terms of public comment to ensure everybody has an
17
18
    opportunity to speak, and we can get through our agenda.
19
             Please note that you will get one opportunity for
    public comment, so make it count.
20
21
             All right. With that, I'm going to pass it on to
    our EJAC and ARB members.
22
23
             Any quick questions from those in terms of
    process?
24
25
             Great. Mary
```

```
CHAIR NICHOLS: Hello, everybody and welcome.
    I'm just going to introduce myself. I'm Mary Nichols,
 2
    Chair of the Air Resources Board, and I do want to thank
 3
    the members of both the EJAC and the Air Board, and our
 4
 5
    staff for turing out. And I know there's a few others who
 6
    are not yet here, but who are planning on filtering in, so
 7
    we'll just have them pick up when they arrive.
 8
             I have been on the Air Resources Board since
 9
    2007. I was appointed first under Governor Schwarzenegger
    and then reappointed under Jerry Brown. It was actually
10
    my second time being appointed by Jerry Brown, because I
1 1
    also served under him when he was Governor during his
12
    first 2 terms of office. And so I consider myself a
13
    lifetime member of the Air Resources Board
14
15
             (Laughter.)
16
             CHAIR NICHOLS: Not quite, but it definitely
    feels like my home. I joined the Board after AB 32 had
17
18
    been passed an signed, and before the scoping plan was
    done. So I had the role in shaping the first scoping
19
    plan, and in shaping the original Cap-and-Trade Program.
20
21
    There's a history there, as many people know, to the views
    of the Governor Schwarzenegger, who was very much in favor
22
    of having a Cap-and-Trade Program, and the legislature
23
    that passed it, which was willing to allow him to do it,
24
25
    but under some fairly strict conditions.
```

1 1

And so in putting that first scoping plan together, I think that we were very careful. I certainly was very mindful of the fact that I was part of an administration which was committed to having a market-based program, but had left it completely to the Board to design the program. And so I think, as most people know, the first scoping plan that we developed included a Cap-and-Trade Program, although the program itself did not start for several years, because it had to actually be designed and the details worked out.

But our vision of the Cap-and-Trade Program was that it would be only one piece of the total California Global Warming Solutions Act Plan. And as it turned out in the scoping plan itself, we asked -- we said we would have a program which would be responsible for approximately 18 percent of the emissions reductions that were called for under AB 32. Although, we hadn't, at that point, worked out all the other regulations, but we certainly already knew that we were going to be relying primarily on our vehicle emission standards, and then also on renewable electricity, and the Low Carbon Fuel Standard to make up the total reductions.

So that's my history with cap and trade.

VICE CHAIR BERG: Good afternoon. Great to see
everybody. My name is Sandy Berg. I'm Vice Chair. And I

was appointed to the Board in 2004 by Governor 2 Schwarzenegger. I hold a 1 of the 2 public seats. And at the time, Governor Schwarzenegger wanted a business person 3 or some -- a regulated party. And I am President and CEO 4 5 of Ellis Paint Company. And it's a small family company 6 in Los Angeles. And so understanding regulation and how 7 to bring that together was a criteria that allowed me to 8 be appointed. 9 Also, being in the Boyle Heights area, I have a strong connection to -- to the -- my community there. 10 We've been there as a family since 1929. And so working 11 with the various community members and things with the 12 schools and various issues with them has allowed me to 13 have an appreciation between economic opportunity, 14 1.5 environmental issues and business. 16 I also was part of AB 32 when it passed, and was on the Board for the first scoping plan. From my 17 18 perspective, it really was taking a blank sheet and figuring out what California was going to do as a leader, 19 and putting knitting together, being part of a program 20 21 that could be duplicated, and as a leadership entity how we could lead the way. 22 In my recollection of cap and trade being just 23 one element of that, and becoming educated as to a program 24 25 of that nature, and not only its ability to participate in

```
brining down the emissions, and -- as well as all the
 2
    other elements. And so that was, from my perspective has
    been a big learning curve. Thank you.
 3
             EJAC MEMBER BAILEY: Good afternoon, everyone.
 4
 5
             Excuse me. I'm Colin Bailey with -- executive
 6
    director and an attorney with Environmental Justice
 7
    Coalition for Water. I've been doing environmental
 8
    justice work for the better part of 2 decades. As an
 9
    organization, we're working on building resilience in
    communities most vulnerable to the water-related impacts
10
    of climate change, which do have some bearing here. Given
1 1
    recent events, it's important to note that the cost --
12
13
    absorbing the costs of evacuating flood is, in fact, an
    environmental justice issue.
14
15
             Our work at the State level in water has focused
16
    a lot on the human rights to water, which California in
    2012 became the first State in nation to memorialize into
17
18
    code. We are hearing from our communities, and we invite
    you to attend the meeting here in Sacramento on March 1st
19
    with our Sierra colleagues looking at forest management
20
21
    and upper watershed management as one in the same.
    opportunity for job creation is very present there, as
22
23
    well as all the water quality and improvements that you
24
    can make.
25
             As a statewide organization, we are well attuned
```

to the trade-offs that many environmental justice and 2 tribal communities are being asked to make, including pitting some groups against others. And we are trying 3 through this process to reconcile those, so that the 4 5 environmental justice is realized for all. 6 With that, I'll pass it on. 7 BOARD MEMBER BALMES: Hi. I'm John Balmes. 8 a physician scientist at University of California, San 9 Francisco and UC Berkeley School of Public Health. And I was nominated to the Board by Governor Schwarzenegger and 10 actually had my hearing the same time as Mary. And 1 1 despite the fact that I wrote in my materials to the 12 13 Senate Rules Committee that I was going to champion environmental justice, I did manage to get confirmed. 14 15 (Laughter.) 16 BOARD MEMBER BALMES: And I tried to keep that commitment that I put in writing at that time. And I 17 18 won't -- I think we need to move along, so I won't go into a long history about my involvement with environmental 19 20 justice issues, but other -- to say that I've tried to 21 keep public health co-benefits as a key theme, with regard to our climate change mitigation policies under AB 32. 22 And I'm particularly interested in doing more with regard 23 to what we are now calling adaptive management. When we 24 25 have cap facilities that produce a lot of greenhouse gas

```
9
    emissions, we also have to try to reduce toxic emissions.
             EJAC MEMBER VALENZUELA GARCIA: Good afternoon.
 2
    Katie Valenzuela Garcia, Sacramento area representative.
 3
    Born and raised in Oildale in Kern County. The
 4
 5
    environmental justice movement here in Sacramento is
 6
    younger than it is in other regions, but our communities
 7
    have, as my friend Jonathan London likes to say, long
 8
    memories. And our neighborhoods here, as in many
 9
    neighborhoods across the State, were built to be racially
    segregated. And we still see to this day, car-centric
10
    land use, poorer health outcomes in our communities of
1 1
    color in the north and south part of Sacramento.
12
13
             So that's what largely informs my positions in
    this committee, and my positions on the scoping plan.
14
15
    Some of our priority areas since we are the
16
    self-proclaimed farm-to-fork capital are urban agriculture
17
    and urban forestry, as well as energy and water and
18
    transportation improvements, since that's where the
    largest share of our pollution burden comes from in this
19
    region.
20
21
             So thank you again for this meeting and the time.
             BOARD MEMBER RIORDAN: Good afternoon. My name
22
    is Barbara Riordan. And I represent the small and
23
   mid-size air pollution control districts. I happen to
24
25
    serve on the Mojave Air -- the Air Pollution Control
```

```
10
    District, and reside in the Southern California area.
 2
             I was on the Board when AB 32 passed. And I have
    been here since the passage, of course, of the first
 3
    scoping plan. So I have some history knowledge based on
 4
 5
    that service of time.
 6
             EJAC MEMBER DINA ARGÜELLO: Thank you.
 7
             Good afternoon. My name is Martha Dina Argüello.
8
    I'm the executive director of Physicians for Social
 9
    Responsibility. And my history with AB 32 goes back to, I
    think, 2005 or '06, when it was still an idea of a bill.
10
    And was around in Sacramento when it was passed and have
1 1
    been on the Committee from -- from, I guess, the very
12
    first Committee.
13
             And my background is in public health. I've
14
15
    spent about the last 40 years working in a lot of
16
    different public health arenas from AIDS, tobacco control,
    to breast cancer. And then sort of realize these seem to
17
18
    have an environmental component. I'm going to go work on
    environmental justice issues. So that's what I've been
19
    doing for the last 18 years at PSR.
20
21
             We work on our -- a principle of first do no
    harm, and that we should move upstream to prevent
22
23
    environmental degradation, as a way of protecting public
24
    health.
25
             Thank you.
```

```
11
 1
             BOARD MEMBER TAKVORIAN: Good afternoon.
 2
    is Diane Takvorian, and I am Board member. I was
    appointed a year ago, actually February. So this is my
 3
    anniversary, I quess.
 4
 5
             (Laughter.)
 6
             BOARD MEMBER TAKVORIAN: And I was appointed as
 7
    the then Speaker Atkins appointee as a result of
8
    legislation that passed, which required that there be 2
 9
    environmental justice representatives appointed to the
    Board.
10
             And I come from -- I'm the Executive Director of
1 1
    the Environmental Health Coalition, and one of the
12
    founders. We're a 36-year old environmental justice
13
    organization. We are a binational organization. We have
14
15
    offices in Colonia Chilpancingo, in Tijuana, which is
16
    next to the largest maquiladora park in the Tijuana
    region, and then our offices are in National City. And we
17
18
    work in the most disadvantaged, low-income communities of
    color that are also very impacted by pollution, primarily
19
20
    pollution from transportation, large industrial
21
    facilities, and port facilities.
22
             So I had the opportunity to serve with some folks
    that are around this table on the first Environmental
23
    Justice Advisory Committee in the early 2000s, which I
24
    think really birthed a lot. And one of the things I think
25
```

```
12
    we're proud of is that it really resulted in the
 2
    CalEnviroScreen coming forward, because we really
    emphasized cumulative impacts and the importance of that.
 3
    And I think we all know where we live and what the impacts
 4
 5
    are on our communities, but CalEnviroScreen allowed us to
 6
    really demonstrate that in an objective and scientific way
 7
    that has, I think, borne a lot of understanding and fruit
 8
    for our communities.
 9
             I also served on the first EJAC. So I had the
    opportunity to participate in the scoping plan.
10
    think that I want to just express my appreciation to the
11
    Board members and to Mary and to the EJAC members for the
12
    incredible amount of work that you've done for this last
13
    year, and for coming to this table today. I think this is
14
15
    kind of a historic moment that we're all together here at
16
    this table, and that we're going to have the conversation
17
    we're going to have.
18
             So I just wanted to express my appreciation to
    everyone. Thanks so much
19
20
             EJAC MEMBER FRANTZ: Tom Frantz from Kern County.
21
    I'm head of a group called the Association of Irritated
    Residents. We've been working on air quality. I've been
22
    a student of air quality issues in Kern County in the San
23
    Joaquin Valley the last 19 years.
24
25
             The -- I'm a farmer, and I was also a math
```

```
13
    teacher for many years. But I'm a farmer first, part of 6
 2
    generations on the same piece of land. And my concerns --
    my biggest concerns in looking at AB 32, this scoping
 3
    plan, and so on is what are we doing with the carbon cycle
 4
 5
    in regard to biomass, sewage sludge, biogas, biofuels,
 6
    carbon capture and sequestration, and trash incineration.
 7
    And all of this concerns us in Kern County. We see it --
8
    we see all these things all around us, including the oil
 9
    and gas industry down there.
             So we're concerned about air, but also land and
10
    water, and, of course, greenhouse gases.
11
             Thank you.
12
             EJAC MEMBER TORRES: Good afternoon and thank you
13
    for his meeting, board members and Mary. This EJAC
14
15
    Committee actually marks my return to policy after 16
16
    years. Incredible Edible Community Garden is a
    volunteer-run organization, of which 95 percent of all our
17
18
    grant funds and contributions go directly to our projects.
19
             As a volunteer-driven organization, we are proud
    of the difference we're making, and we believe that
20
21
    communities need to be involved in all discussions
    regarding neighborhood restoration and climate adaptation
22
23
    from within the neighborhoods.
             We believe that successfully mitigating and
24
25
    adapting to the cumulative effects of environmental
```

```
14
    degradation and poverty requires a clear understanding,
 2
    and -- I'm sorry, clear understanding and empowerment of
    the community not for exploitation, but for shared
 3
    neighborhood building solutions and decision making.
 4
 5
    that in mind, Incredible Edible Community Garden
 6
    facilitates a dynamic vision for transforming our
 7
    communities, while creating cohesive standards and best
8
    management practices in growing spaces for food
 9
    production, active living, ecosystems, training, and
    services, while engaging our communities in creating and
10
    learning urban solutions to grow, heal, and build
1 1
    collectively and effectively.
12
             With these principles IECG is very proud of the
13
    fact that we also advocate for environmental justice
14
15
    principles, but we also implement those policies. So it's
16
    very important to us that these policies are -- we are
    able to implement these policies.
17
18
             Thank you.
             BOARD MEMBER MITCHELL: Good afternoon. My name
19
    is Judy Mitchell. I am City Councilperson in the City of
20
21
    Rolling Hills Estates in Southern California. And I
22
    represent the South Coast Air Quality Management District
23
    Board on the Air Resources Board.
             I'm elected to that board by the 50 -- a majority
24
25
    of the 51 mayors in the western half of Los Angeles
```

```
15
    County. I have a history of interest in environmental
 2
    quality issues. I was very active in the League of
    California Cities, in my course of being an elected
 3
    official. I was president of that organization in
 4
 5
    2009-2010. And that was the time when we were working
 6
    with Darrell Steinberg and Tom Adams on SB 375, which is
 7
    the sustainable communities plan. And that was very
8
    controversial for all of the cities across the State of
 9
    California.
             They've come to a point now where they adopted
10
    and have embraced it, so I'm happy to say that we've come
11
    that far.
12
            I was appointed to the Air Resources Board in
13
    2013. And so I'm relatively new to this process, and cap
14
15
    and trade was pretty much a new process to me as well,
16
    but, you know, we've had to sort of break in here and
    learn all the ropes on it, and -- so I'm still learning.
17
18
             But anyway, appreciate coming together with all
    of you. Very anxious to listen to your concerns and work
19
20
    with you to find solutions.
21
             EJAC MEMBER OLMEDO: Good afternoon. And this
    is, as Board Member Takvorian mentioned, it's quite
22
    historic. I don't remember every doing this. This is the
23
    second time I've been in the EJAC scoping plan, and wasn't
24
    quite expecting this, but I'm, you know, guite honored to
25
```

```
16
    be around the Board members. So thank you.
 2
             I'm the executive director of Comite Civico Del
    Valle, a community based organization. And a lot of my
 3
    colleagues here have highlighted a lot of the issues that
 4
 5
    concern us. What I bring here is Imperial is the
 6
    furthest, I think, along with San Ysidro, from Sacramento.
 7
    We're probably not as loud of a voice. And sometimes -- I
8
    know Stephanie reminds, you don't have to use your outdoor
 9
    voice, but I think we do --
             (Laughter.)
10
             EJAC MEMBER OLMEDO: -- because we're so far.
1 1
             But there's a lot of issues, you know, that
12
    happen, you know, from dairies, you know, to feed lots. I
13
    mean, I think a lot of the same issues that have -- that
14
15
    are of concern in rural communities are just as the same,
16
    even more, you know, with the heat, and, you know,
    probably living in one of the hottest areas in California.
17
18
    Add to that the border, you know, and the fact that, you
    know, we're also consumers of products and energy from
19
   Mexico that we feel the impacts in the border.
20
21
             So I like -- you know, I bring that here to the
    discussion. We have been working on projects of, you
22
    know, both engaging the community, but also more recently
23
    in the last 2, 3 years, we've been working on citizen
24
25
    science, or community monitoring, and crowd sourcing, and
```

```
17
    bringing more data. And I know that's something that I
 2
    continue to bring, because we need to measure
    effectiveness at the community level. We need to know
 3
    what's happening in the neighborhood, not just, you know,
 4
 5
    at the higher levels, the average, but is our area
 6
    improving, are these programs not affecting certain
 7
    communities or transferring pollution to other
 8
    communities.
 9
             And I really will continue to stress that we need
    to engage the community to participate, because we know
10
    that there's not enough money to go around when it comes
11
    to environmental protection. We know that we need to
12
    engage the community, and to be able to bring the
13
    expertise, the technical knowledge to be able to level the
14
15
    conversation for all communities in California. So thank
16
    you for this opportunity.
             And I knew that, at some point, there would be a
17
18
    highlight for me as a member. And this is really, I
    think, my highlight here. This is my peak of a moment
19
20
    being a member.
21
             So thank you.
22
             CHAIR NICHOLS: We should take a group photo
23
    before this is all over.
             (Laughter.)
24
25
             CHAIR NICHOLS: Really.
```

1 1

EJAC MEMBER FONG: Good afternoon. My name is Gisele Fong, and I am from End Oil and Communities for Clean Ports in Long Beach. This is the second time I've been on the EJAC.

And just to kind of start with something really personal that I left a career as an academic to move into environmental health and justice work, because I was raising my babies in Long Beach. And the more I learned about what it meant to raise kids in degraded air quality, the more I really figured out that I wanted to make an extreme change for my professional energies.

So some of the -- really briefly, some of the issues that our communities of Long Beach and San Pedro, and Wilmington and Carson, the port-adjacent cities deal with, of course, are the air quality issues and the community impacts that come from freight transportation and goods movement. We also are surrounded by a ring of oil and gas operations.

So everything from oil and gas extraction and the kind of off-drill -- offshore drilling to the pipelines that run under our cities to really literally a ring of refineries around -- around our communities that are really within 500 feet of high schools and parks and so forth. So -- and then, you know, also just kind of thinking back of our community workshops last summer, I

```
19
    think that people are really thinking about what it means
 2
    to be, what it means to live in very dis-invested cities,
    very dis-invested communities.
 3
             And so when we think about the solutions towards
 4
 5
    that, we're really looking at how is it that -- how is it
 6
    that people live these experiences and what can we do to
 7
    not only have the bigger targets about emissions
 8
    reductions, but really to improve quality of life and true
 9
    investments in our communities.
             Thank you. And thank you again for this
10
11
    opportunity.
             EJAC MEMBER HAMILTON: Somehow I got stuck --
12
13
    yeah thanks, Sean. I didn't have a workplan from you to
    quide my research.
14
15
             My name is Kevin Hamilton. I'm I registered
16
    respiratory therapist. I'm a resident of Fresno,
    California, and have been since 1986. I'm originally from
17
18
    Youngstown, Ohio, where you get to experience
    environmental justice firsthand. And at the time I
19
20
    experienced it, it was before it had the name.
21
             When the steel mills turned our skies black and
    our rivers red every day, and we thought that was just the
22
    way it should be, where people that regularly sacrificed
23
    their lives to go work to every day and make sure their
24
25
    families were fed and housed with the anticipation that
```

they would be taken care of long after they died, which normally was very soon after they retired, if they made it to retirement.

This is the kind of history that we want to avoid repeating, and that our technology today allows us to avoid. And it's one of the things that I fight for every day that I have the opportunity to do that.

I'm also the Executive Director of the Central California Asthma Collaborative, and a founding member Central Valley Air Quality Coalition and Medical Advocates for Healthy Air. You kind of get from the name that I've been working on air pollution and health for a long time.

This actually comes out of personal experience with both my family, where my mother suffers from COPD, and my wife and 2 of my children out of the 4, and 4 out of my 10 grandchildren all of asthma. So a number of them have now moved out of the valley, where they have better health now, are not experiencing all the symptoms from asthma that they were when they lived in the valley.

It's unfortunate to me that my children had to move away from me in order to experience clean air and good health.

But CCAC works to see a -- San Joaquin Valley where the health of every resident is our foremost concern. And we envision environments and systems of

1 1

support for health that are reflected in the resources, information, and activities and policies in every community.

So when the Governor passed the bill that said health in all policies, I was really thrilled, because our health is our primary asset as a human being. Everything else we have to earn. Our health we get coming in. And it's ours to lose over time. We make bad choices that cause us to lose our health, well, that's on us. But when those choices are taken out of our hands and other people are making those, or we're forced to sacrifice them in order to make a living every day and feed our families, I see that as completely unfair, and a poor decision to have to make.

And so the communities that we live and work in every day are making that decision. And I have people who argue with me that in order for them to have a job, they may need to sacrifice something, and that something appears to be their health, simply so that they can go to work every day in an industry that, as a by-product of its economy and value to the society, is also causing significant health consequences to not only the people who work there, but what they often don't realize and the folks who are doing that work don't realize, it's affecting the health of the very people they're trying to

```
22
    protect, their wives, their children, their husbands,
 2
    their grandchildren.
             So I think we all do this work every day to
 3
    change that dynamic, and I think we have an opportunity
 4
 5
    with this scoping plan, and the subsequent work that comes
 6
    from that, the policy work, the legislation, the
 7
    regulations that fall from that, and then, of course, most
8
    importantly, how it's integrated and implemented at the
 9
    system level.
10
             And I think it's great to be part of a group
    where everybody shares those goals in that work. And so I
1 1
    thank you for that opportunity today, Ms. Nichols and
12
    Board. This is the way we should meet all the time, and
13
    this is the way you should meet all the time. You should
14
15
    just tear that thing down up there --
16
             (Laughter.)
             EJAC MEMBER HAMILTON: -- and, you know -- and
17
    this is what we should do is just have some conversations.
18
             Thank you.
19
             EJAC MEMBER ROSE TARUC: Hello. I'm Mari Rose
20
21
   Taruc. It's great to be here on this joint meeting. I,
    as an immigrant, grew up in the small town of Delano in an
22
23
    EJ community in the Central Valley. I have worked for
    environmental justice for 25 years now, and I used to be a
24
25
    young person who was starting out -- Diane remembers me --
```

1 1

starting out in the Southwest Network for Environmental and Economic Justice that was focused on Dozens of EJ communities in the southwestern United States and northern Mexico.

And as a young person, I was entrusted with the task of serving these dozens of EJ communities in the southwestern, northern Mexico. And so I had the experience and responsibility of visiting EJ leaders in -- in Texas towns dealing with military toxics, with border towns dealing with waste dumps coming from -- waste coming from the U.S., tribal lands who were being mined for uranium and other materials, farm workers, farm worker towns dealing with pesticides and the -- and the injustice to them as workers, and to the urban areas, including oil refineries that explode constantly.

And so I found myself working at APEN, the Asian Pacific Environmental Network, for 2 decades. And so an example of the Chevron oil refinery and the daily threat of that, as well as these large explosions that a few years ago sent 15,000 people to the hospital. So not only the daily assaults, but these huge, huge fires that would then happen because these industries are about explosions, and burning, and burning of fossil fuels.

 $$\operatorname{And}$$ so APEN also -- and the Richmond community is one of the hubs nationally in the climate justice alliance

1 1

focused on how we -- a just transition project for how we can envision where -- how to transform these communities to have clean energy, and to have local ownership of new industries and technologies in our economy, and to take that back for ourselves. And so I bring that perspective into the scoping plan and this work.

BOARD MEMBER SERNA: Hello and welcome to Sacramento County. My name is Phil Serna, and I have the honor of serving on the Air Resources Board now for about 3 and a half years. I was appointed in 2013 by Governor Brown. I am the result of legislation that added a member back in 2012, I believe, when then Assembly Member Roger Dickinson sponsored a bill that added a position to represent the 5 regional air districts in and around the Sacramento -- greater Sacramento area.

As is the case with Board Member Mitchell and a few of our other Board members, I have, I think, a unique perspective, in that I'm both a practitioner of local governance as an elected member of the Sacramento County Board of Supervisors, but also serve on the local air district here, as well as on the local transit district board of directors. I'm coming off 6 years of serving on our local COG board as well. So almost daily, I see the intersection of much of what we do here, in terms of implement -- policy implementation, resource allocation

```
25
    that's associated with that, as it actually hits the
 2
    ground. And I think to the delight probably of Ms.
    Valenzuela Garcia, the lens I really look through,
 3
    especially in the context of today's meeting, is really
 4
 5
    looking -- looking at how cap and trade can certainly
 6
    benefit the disadvantaged communities that I have the
 7
    honor of representing, communities like Del Paso Heights
 8
    and South Oak Park here in Sacramento County, some of the
 9
    poorest areas you're going to see anywhere in this greater
    Sacramento region.
10
             And so I, too, agree this is a historic day. And
1 1
    I'm really pleased to see a great turn out. I did have
12
    the pleasure of serving briefly as a liaison from our
13
    Board with the EJAC when it was reconstituted a few year
14
15
    back. I'm glad that we do have our dedicated members now
16
    representing environmental justice on our Board. I think
    it's a very fitting complement to work we do, and look
17
18
    forward to getting on with today's work.
             Thank you.
19
             EJAC MEMBER SHAKUR: Hi. My name is Kemba
20
21
    Shakur. And I'm the executive director and founder of
    Urban Releaf, an urban forestry organization. Prior to my
22
    work with Urban Releaf, I worked at Soledad Prison. And
23
    at Soledad I saw -- being born and raised in San
24
25
    Francisco, I saw a lot of the males that I grew up with
```

```
26
    there. Once I left Soledad and moved to Oakland, I was
 2
    amazed at the lack of greenery. The prison grounds had
    more greenery than many other streets of Oakland.
 3
             I wanted to create a program -- or I created a
 4
 5
    program actually 18 years ago, where I wanted to merge
 6
    young people with green jobs and training. So within the
 7
    last 18 years, we've planted over 17,000 trees, engaged
8
    local youth around environmental justice -- well, no,
 9
    excuse me, around environmental education, job training,
    and environmental awareness.
10
             Another really positive thing that we've done is
1 1
    engaged in research. We've engaged in over four or five
12
    research projects with Center for Urban Forestry Research,
13
    and equated trees as they relate to water, air,
14
15
    psychology, and tree mortality.
16
             I first got involved with the environmental
    justice movement I think round 2006. Margaret Gordon
17
18
    said, you know, she was focused on the port and goods
    movement, but she was like we need a tree person.
19
20
             (Laughter.)
21
             EJAC MEMBER SHAKUR: Because I kept telling her,
    hey, trees are the solution, you know, so -- so with that,
22
    I'm really glad to be a part of this Committee. I've
23
    learned a lot and am learning every day about policy.
24
25
             Thank you.
```

```
27
1
             DEPUTY EXECUTIVE OFFICER CHANG: Hi. I'm Edie
    Chang. I'm with the California Air Resources Board. I'm
2
    a Deputy Executive Officer, and I oversee our climate
3
    change programs. So I was one of the early staff to start
4
5
    working on climate change programs. And I worked on the
6
    first scoping plan. I worked on the second scoping plan,
7
    and we're working on this round, the third scoping plan.
8
             EXECUTIVE OFFICER COREY: I'm Richard Corey,
    Executive Officer of the Air Resources Board. And when I
9
    joined the Board, actually it was the result of some
10
    legislation, toxics legislation, that had been passed in
11
    1983. So I came to the Board in '85 and worked on a
12
    number of toxics regs, and believe in our mission, but I
13
    also believe in learning, and being as effective as we
14
15
    can. I'm really looking forward to the discussion today.
16
             So thank you.
            MODERATOR LUCERO: Okay. And Board Member De La
17
18
   Torre we skipped over you.
             BOARD MEMBER DE LA TORRE: Thanks. Sorry, I had
19
    to step out to get a call.
20
21
             I think this is great. We had the session last
    week in Berkeley, where we talked about some of these
22
    issues. Obviously, last month at our regular Board
23
   meeting, we had a conversation about this. And I think
24
25
    it's very important for us, as -- at the Board, to really
```

```
28
    go through all of those recommendations that you presented
 2
    to us, and identify the things that we can move forward
    on, and frankly not wait for a scoping plan.
 3
             If it's stuff that can be done short term, we
 4
 5
    should jump into it. If it's stuff that can be done
 6
    medium term, then we put that obviously in the scoping
 7
    plan, and then long term in the scoping plan.
 8
             In my time on the Board, we've had a few issues
 9
    related to goods movement, things that I -- that I
    personally experience in my part of California, goods
10
    movement is very, very important, railyards, the trucks,
1 1
    the ports. And so in my time on the Board, I have felt
12
    that we're always kind of waiting for something more. And
13
    I think it's just time. It's time to move forward.
14
15
    Obviously, we'll put it into the scoping plan as we see
16
    fit, but we need to use all the tools at our disposal.
             Cap and trade is part of it. Our regulatory
17
    authority is part of it. Toxics control, we don't do
18
    that, but we know the people who do. GGRF is part of it.
19
    So all of the tools that we have here at CARB and with
20
21
    sister agencies, we need to bring into this cause, because
    the impacts aren't just ours, the stuff that we oversee.
22
    The impacts are happening -- water as well -- our
23
    happening in these communities, and my community, and we
24
25
    need to come up with a bigger framework than just the
```

```
29
    cap-and-trade framework, because it is -- it's -- the
 2
    impacts are all over the place.
             And so that's what -- where I would like to see
 3
    this end up, and I think we can. I think this dialogue is
 4
 5
    part of that.
 6
             Thank you.
 7
             MODERATOR LUCERO: Mary, did you want to give
8
    just a quick overview of kind of the expectations of what
 9
    we take from the discussions today moving forward,
    timeline, and so forth?
10
             CHAIR NICHOLS: Sure. Several of us had an
1 1
    opportunity to meet with Stephanie by telephone prior to
12
    today, and that's where the agenda came from.
13
             And again, the idea is that the Environmental
14
15
    Justice Advisory Committee members will present the
16
    recommendations in groups, basically, based on the work
    that they did to get to those recommendations. These --
17
18
    this is not the first time that they've been presented to
    the ARB, but it will be the first time that we've had a
19
    chance sitting around the table to talk about them.
20
21
             And the hope is that board members will get a
    chance to ask questions informally that we can -- you
22
    know, this is not a hearing. Obviously, that was one of
23
    the reasons for having the meeting arranged this way.
24
25
             But the -- I think that respecting our roles
```

3.0

means that we get to hear from the Committee something about how they arrived at their recommendations, not just the bottom line, which we could read for ourselves, but really the thinking behind the recommendations, and that the Air Resources Board members will also get a chance again, hopefully in a pretty informal way, to ask questions or comment in a way that is designed to try to further all of our understanding.

I know everybody those this, and it sounds maybe a little bit too basic, but at the end of the day, the Air Resources Board is charged with developing a scoping plan and regulations. Under the climate legislation, we also have the overarching responsibility for achieving air quality standards in the State of California.

One of the reasons why -- I think, in many ways, probably the main reason why the legislation that created the California Climate Program, also called upon the Board to create an Environmental Justice Advisory Committee, was a concern on the part of the legislature that in beginning to deal with this global issue of -- of climate change, that the Board would lose its focus, lose its a -- lose attention, or even perhaps do things that might avoid its responsibility to deal with health problems of residents of the State of California, in the interests of, you know, moving ahead on this international agenda.

1 1

And so they wanted to make sure that we heard from people who actually represented the communities that are the most impacted by our current levels of pollution. And the Environmental Justice Advisory Committee was one of a couple of committees that were actually called for by AB 32. But the other 2 pretty much disbanded, because they gave their recommendations. They weren't necessarily all followed, but they felt like they had done what they could do as committees. And most of the members of those committees -- well, all of them were either representatives of a long-standing industry organizations, or environmental organizations, or academics who had ongoing relationships with the Air Resources Board in one place or another.

And the environmental justice community, as an organized presence in California, still seems to be relatively, new compared to the other entities, and more of a more of a situation where the Board really needed to have an opportunity to get formal advice from people who came from the constituency. So we -- we reconstituted the EJAC after the original scoping plan, and have had now the opportunity to, I think, do a better job, at least in terms of engaging at the staff level, having opportunities for the EJAC members to introduce ARB staff to many members of their communities, through the events that

we've gone out and done around the state, and also to get to know our folks, and some of the thinking that goes into their work.

But, you though, we still have a situation where, you know, we have another plan to do, and we need to hear from the Environmental Justice Advisory Committee as a group, as well as hopefully individuals as well. It seemed like this was a good opportunity to do that.

I think in terms of expectations of where we would end up, it would be wonderful if, at the end of the day, we adopted a plan, and, you know, the Committee got up and said that's just wonderful. It's just everything we ever hoped for.

I think that's probably not likely to happen.

But what I really am hoping for is that we can acknowledge the areas where we have really responded to advise that we were given to the -- that we can note things that we've done that were a success, as well as those that weren't, things where we need to do further work, and that we can come up with a process, whereby if we don't agree, we can park -- we can park an issue and continue working on it, so that, you know, if the scoping plan that does get adopted isn't everything that you all hoped it would be, that that isn't the end of the story, that some issues may get addressed, either in later implementation of the plan,

```
33
    in further planning efforts, or even possibly in other
 2
    places where -- whether at the ARB, in our regulatory
    proceedings, or in working with other agencies around the
 3
    State as well, because a number of the issues that you all
 4
 5
    have identified, and that we've identified, are things
 6
    where we need other agencies, and frankly, other resources
 7
    to be involved in actually accomplishing what our goals
 8
    are, like, you know, changes in the priorities for
 9
    transportation funding, just by way of a simple example.
             So having said that, that's what I hope we can
10
    get out of this next -- this next half of the program, and
1 1
    looking forward to it.
12
             MODERATOR LUCERO: So. Before we go to the next
13
    step, which is really for the EJAC to give an overview,
14
15
    and start a discussion on the sectors, just a quick
16
    reminder, if you do have a question or comment, pull this
    up this way. I'll keep track as best I can of order of
17
    preference. Anybody want to add anything before we move
18
    on to the sector and recommendations?
19
             All right. Let's get down to business.
20
21
             All right so for those -- Diane.
             BOARD MEMBER TAKVORIAN: I don't if there's a
22
23
    webcast -- no. So it's internal webcast.
             MODERATOR LUCERO: No. It's internal to ensure
24
25
    that ARB staff that need to hear these conversations can,
```

```
34
    and we have enough room the public.
 2
             BOARD MEMBER TAKVORIAN: Thank you.
             MODERATOR LUCERO: Mari Rose, mic.
 3
             EJAC MEMBER ROSE TARUC: Just for notes, so
 4
 5
    somebody is officially taking notes, right, so that we can
 6
    report back.
 7
             MODERATOR LUCERO: We have court reporter.
 8
             EJAC MEMBER ROSE TARUC: Court reporter.
 9
             And then is it possible -- so some of us,
    especially from this morning's EJAC meeting, are really
10
    visual in terms of like next steps, can we -- is there --
11
    can we get a flip chart to -- all right. Very good.
12
             Thank you.
13
             (Laughter.)
14
15
             MODERATOR LUCERO: I'm here for you, Mari.
16
             (Laughter.)
             MODERATOR LUCERO: All right. Any other process
17
18
    or quick questions?
             While we're on process, you know who you are,
19
    turn those phones to silent. We had a couple ring. Just
20
21
    put them to silent or turn them off, if you can. I've
    been there myself. I understand.
22
             All right. So with that, let's move on to our
23
    EJAC.
24
25
             Who's going to be doing our overarching issues
```

```
35
    discussion?
 2
             Mari Rose.
 3
             Okay, Martha.
             EJAC MEMBER DINA ARGÜELLO: Well, I mean, I think
 4
 5
    that our overarching issues have pretty much stayed the
 6
    same -- consistent, I think, for almost every single EJAC.
 7
             And before I go into them, I did want to sort of
 8
    give you a little bit of what lies behind our thinking.
    And when Mari Rose and I were prepping I kept thinking of
    a scale, right? And if you think of the scoping plan as a
10
    scale that has to improve air quality, set the stage for
11
    this new economy that we want to propel, that's not based
12
    on the extraction and burning of fossil fuels. But also
13
    part that's embedded in AB 32 is this idea that you're not
14
15
    going to make things worse for communities that are
16
    already here, right?
17
             So how do you balance that scale with benefits
18
    and burdens? And how do we understand this information
    that we're getting that we -- that we've -- that we've
19
    known on the ground that if you're not careful with a
20
21
    Cap-and-Trade Program, there is this risk of increasing
                                                                FebEJAC-1
    air pollution. And that's actually what we're seeing now
22
23
    in -- we've begun to see some of that information in these
24
    early warning systems.
25
             And so that really is shaping our thinking, that
```

1 1

we've got to figure something out. And, yes, I know we're not going to get everything. But I think it's important to go back to that mission that we feel all of us have of improving air quality, creating a new economy, and a just transition, and balancing those benefits and burdens, and making sure that the communities that have been sacrifice zones are now ones that we invest, and we build the amazing resilience.

Because we have to remember that given all these assaults, our communities are amazingly resilient already. And so what -- and I'm going to borrow from Margaret Gordon, since we've talked about her today. It's about making sure that our communities are able to thrive, and those are 2 very different things.

And so our overarching concerns have been related to how we do that. And that's -- one is around encouraging public engagement in a different conversation right with the Air Board. And this idea that health comes first, right, and that those health benefits have to be measurable. So we want to be able to demonstrate those community level solutions, and what are the -- what's the information and the tools that we need with CARB to be able to show the community level improvements.

And we also believe that there is a continuing life for EJAC. And the one difference between EJAC and

37 the other committees that were in the bill is that we were 2 not -- there was no sunset date for us, right, because achieving environmental justice and balancing those scales 3 is an ongoing work. 4 5 And so this idea of grounding our work in 6 equity -- I'm going to kind of deviate a little, because 7 of what's been said. So I want us -- and I said this at 8 the last Board meeting, our attempt here is to make this program work as best as we can, and we are partners with 9 the Air Board in doing that. And that's going to require, 10 on both of our sides, some compromise, and some looking 11 beyond the dogma of what's -- what we have versus what is 12 possible. 13 14 And so while we are right now, you know, as an 15 original member of EJAC, and one who sued around the 16 scoping plan, we continue to feel that the scoping plan lacks real specificity on what are those health benefits 17 18 that are going to come, and we recognize the data gaps in getting there, and so we want to work with you to get 19 20 there. 21 We also realize that until there is an acknowledgement that there is another way, that we can 22 reduce air emissions, that we can put a price on carbon, 23 and we can improve air quality and health. Until we 24 25 acknowledge that there is that other way, we're a bit at

```
38
    loggerheads. And so need a commitment from the staff and
 2
    the Board to examine the possibilities of a carbon tax.
    And I got quoted in NPR, and I'd had too much coffee, and
 3
    I was kind of pissed off --
 4
 5
             (Laughter.)
 6
             EJAC MEMBER DINA ARGÜELLO: -- and I said, "I
    don't care about political expediency", just in case any
 7
    of your heard it.
8
 9
             (Laughter.)
             EJAC MEMBER DINA ARGÜELLO: And I do care about
10
    political expediency, but I care more about people's right
11
    to breath clean air. And so we actually need to not get
12
    so stuck that this is the only way, and see that there
13
14
    might be another way to achieve the benefits that
15
    community people want, right -- because we get fixated.
16
    This is the juice I like. If you give me another one, I'm
    not going to like it, but I'm might -- I won't taste it,
17
18
    right, if I'm my 7-year old niece, huh-uh.
19
             So we need to be flexible and say that there is
    another way, and actually credibly look at that other way
20
21
    with a carbon fee. And I know you gave me a minute, but
    I'm going to pretend I didn't see it.
22
             (Laughter.)
23
             EJAC MEMBER DINA ARGÜELLO: And the other part of
24
25
    the overarching issues is that we really need to be
```

```
39
    partners in collecting the data that will allow us to
 2
    evaluate and you see as our -- we are your troops for
    ground-truthing, right? We are your boots and pumps on
 3
    the ground that will help you both protect the program and
 4
 5
    make it better. And that's where we want to be with the
 6
    Board and staff.
             Thanks.
 8
             CHAIR NICHOLS: So can I just ask one question,
 9
    is that all right?
             My question is about the scoping plan versus
10
    other places. I know we're here to talk about the scoping
1 1
    plan, and that's what's before the Board at the moment,
12
    but you also know, because you've worked in this area for
13
    a long time, but there's a State Implementation Plan,
14
15
    there are local district plans, there are things that both
16
    our -- doing what we want them to do, and there are things
17
    that maybe are not doing as much as we want them to do.
18
    And I guess I'm asking if your conversation is intended
    more broadly, if your comment is intended more broadly?
19
20
             EJAC MEMBER DINA ARGÜELLO: Yes. And I have to
21
    say, and I almost feel like this is with my PSRLA hat, I'm
    working in the South Coast, and my staff is working at the
22
    South Coast on the AQMP. And then I know that that
23
    relates to the SIP. I'm not the lawyer. I'm not the
24
25
    policy -- you know, but I know that they're related.
```

4 0 And sometimes I feel like we're not having --2 like why is this conversation that we have here at EJAC feel so separate from the worker that we're doing on the 3 ground, whether it's on zero -- you know, on the freight 4 5 stuff that's happening at both South Coast and in the 6 Central Vallev? 7 And so maybe there is -- I think that's a really 8 good question, like, how do we see the full scope and --9 yeah, the full scope of the things that are going to get us to those goals? 10 CHAIR NICHOLS: Thanks. 1 1 MODERATOR LUCERO: And I'm just going to point 12 out, because I don't see any cards, the EJAC does have a 13 set of coordination recommendations in appendix that 14 15 relate to some of this I think that what you're talking 16 about, Martha. 17 John. 18 BOARD MEMBER BALMES: Thank you, Martha. quick response. This is an idea that I haven't vetted 19 20 with my Board colleagues, staff, or otherwise. But even 21 if our current analysis, which I've been briefed on, suggests that cap and trade -- continuing cap and trade is 22 sort of the best way to go in terms of greenhouse gas 23 emissions right now, curbing them, I think it would be 24 25 nice for the scoping plan to say that we have an open mind

```
41
    about the future.
 2
             We have a big, you know, lift to get to the
    greenhouse gas emission reductions that we need to. And
 3
    it may be that cap and trade isn't the way to get all the
 4
 5
    way there, so -- and I'm not considering political
 6
    expediency when I look at my colleague Hector.
 7
             (Laughter.)
 8
             BOARD MEMBER BALMES: But it just seems like
 9
    having that in the scoping plan, that we have an open mind
    for the future would be a small way to respond to the
10
    legitimate concerns of EJAC.
1 1
             Just an idea.
12
             EJAC MEMBER ROSE TARUC: I agree with John on
13
    that open mind. I also wanted to raise -- so we were
14
15
    presented with 5 scenarios basically in the scoping plan.
16
    And even yesterday, we were getting briefed by the staff
    on those scenarios, and we're -- and even some of the
17
18
    discussion from the last Board meeting when EJAC
    presented, there was such an interest in health metrics
19
20
    and air quality metrics in looking at -- and evaluating
21
    which scenario is the best for California.
22
             And so yesterday, even in the staff briefing, we
    did not see what those -- like any health or air quality
23
   metrics in those scenarios. They would say, well, these
24
25
    are -- these are advantages to this scenario, and these
```

```
42
    are -- these are disadvantages, but -- or downsides, but
 2
    then none of them actually talked about health and air
 3
    quality.
             And so we want to see in the scenarios those
 4
 5
    health metrics, so that we could see, well, this might be
 6
    good on the economic side of things, but this is -- this
 7
    scenario is better in terms of health outcomes, especially
8
    for EJ communities, et cetera. And so we haven't seen
    that yet, and we want to see those in the scenarios.
 9
             And I wanted to see is there -- maybe, Edie,
10
    like, is there some of that already going to happen before
11
    the full -- before the final draft is put out.
12
             MODERATOR LUCERO: Any responses?
13
             VICE CHAIR BERG: I just wanted to understand and
14
15
    get a clarifying question, is -- are these health metrics
16
    and air quality metrics, is it a one-size-fits-all in
17
    every community?
18
             EJAC MEMBER ROSE TARUC: Well, Martha, do you
    want to --
19
             EJAC MEMBER DINA ARGÜELLO: Ask me that again?
20
21
             VICE CHAIR BERG: So when you're asking for these
    health metrics or the air quality, I just wanted to
22
    understand is it the same metrics for every community? Is
23
    it a one size fits all?
24
             EJAC MEMBER DINA ARGÜELLO: And Dr. Balmes and I
25
```

```
43
    both worked on the Environmental Health Tracking Program,
 2
    so we probably both -- so, yes. So there's part of it
    where we actually -- it has very little to do with CARB,
 3
    but you could really help is in pushing the Environmental
 4
 5
    Health Tracking Program, local health departments to do a
 6
    better job of geocoding and collecting data.
 7
             The other piece is around air monitoring, right?
8
    What's happening with particulate matter? What's
 9
    happening with other toxic air contaminants?
             And so that early warning system that's supported
10
    by data is what we want. So, yes, we should be tracking
1 1
    birth outcomes. We should be tracking actual asthma
12
    cases, not just ER visits. There's a whole series of
13
    things, and then there's the air monitoring, very
14
15
    localized. And you could right now say, you know, if this
16
    is a community that has 10 traded entities, we should be
    very, very carefully tracking all emissions, right,
17
18
    because that's how you get it. And I will stop, because
    he's the Ph.D.
19
             BOARD MEMBER BALMES: M.D. not Ph.D.
20
21
             Well, I just was brief -- I was just briefed
    by -- I was just briefed by staff this morning about the
22
    scoping plan, and they -- I missed the January meeting,
23
   where this apparently came up, but I was very pleased to
24
25
    hear that there's an effort by staff to monetize health --
```

```
4 4
    potential health benefits of cap and trade.
 2
             It's not exactly what you're asking for and I
    totally support better track -- as you know, better
 3
    tracking of health outcomes across California, but
 4
 5
    especially relating to disadvantaged communities.
 6
             And you know CalEPA -- CalEnviroScreen gives us,
 7
    you know, an opportunity to do this. And all I can say is
8
    I totally agree that we should be trying to gather data on
 9
    the public health impacts, negative or positive, with
    regard to our policies, including cap and trade, but
10
    across the board actually.
1 1
             EJAC MEMBER DINA ARGÜELLO: It's really important
12
    that whatever instruction is given, it's about measure the
13
    impacts, because if you -- if I'm -- you're my boss and
14
15
    you give me an assignment to go find you benefits. You
16
    know what I'm going to do? I'm going to go find you
    benefits. But if I'm assignment is to find you impacts,
17
18
    that's different. And I think that's a really important
    distinction.
19
20
             MODERATOR LUCERO: Martha, you're a little soft
21
    spoken, so I'm going to make sure speak right into the
22
    mic.
23
             EJAC MEMBER DINA ARGÜELLO: Nobody has ever said
24
    that to me.
25
             (Laughter.)
```

```
4.5
             MODERATOR LUCERO: You're trying to behave.
 2
             (Laughter.)
             MODERATOR LUCERO: Okay. So I next have Diane.
 3
             EJAC MEMBER ROSE TARUC: Is there a staff
 4
 5
    response wondering -- I asked if, from staff, there is
 6
    going to be health metrics for assessing the 5 scenarios
 7
    that are presented in the scoping plan.
 8
             DEPUTY EXECUTIVE OFFICER CHANG: So as Dr. Balmes
 9
    said, we're in the process of -- you know, we did get some
    Board direction on this, so we're in the process of
10
    looking at how we can provide health outcomes, and then
1 1
    monetize those health outcomes for the different
12
    scenarios.
13
             There is also a table that's in the draft scoping
14
15
    plan that provides estimates of the criteria pollutant
16
    emission reductions from each of the proposed measures
    that are in the scoping plan. We're going to restructure
17
18
    that table, so it's easier to see what it looks like from
    each different scenario. And then we're also continuing
19
20
    to talk to folks to see if there's any other additional
21
    health work that we can do.
             MODERATOR LUCERO: Diane.
22
             BOARD MEMBER TAKVORIAN: Yes. So I appreciated,
23
   Mary, you question about how does all this fit together?
24
    And I know you asked it more eloquently than that, but I
25
```

is healthy communities.

2

3

4 5

6

7

8

9

10

11

12

13

14 15

16

17 18

19 20

21

22

23

24

25

think that's the question that our communities have been asking. And frankly, I've experienced some frustration on the part of Board and staff in regards to that question getting asked, because what I think we're all really about

46

And so what's the plan for that? And if the plan for that is, you know, 500 parts, and we've got to be at the air district, and we've got to be at the ARB, and it's -- it's just very diverse and very spread out, and we're really not sure what it all adds up to, then that's really not good enough.

Really, our communities deserve to be healthy, and we do -- while I absolutely support what Martha is saying about tracking and monitoring, we know a lot. So we know a lot right now about what communities are the most impacted, what communities have folks in them that are very sick, kids that are very sick. And it's our obligation to do all we can about that. And I think it's diverse. I don't think it's a one size fits all.

And frankly, I'm a little -- I think on many sides, you know, this odd allegiance to cap and trade -- I appreciate what you said about -- I remember, the Governor was very enamored with -- let's -- with cap and trade. There's this market mechanism. This is going to make it right for everyone. And I think we're seeing that perhaps

```
47
    it isn't. But if it -- if it is, then we need proof of
 2
    that, and I don't think that's on the table yet.
             But I really appreciated Martha's comments of
 3
    let's see what else there is out there, and I don't really
 4
 5
    care what we call it, whether it's cap and trade, or Pete,
 6
    or, you know, whatever it is. Let's -- let's do what we
 7
    think is the right thing to do that will reduce the
 8
    emissions and reduce the illness and environmental
 9
    degradation in our communities.
             You know, what's the best path for that, and how
10
    do all these things come together? And I know we're going
1 1
    to talk about it more, but I feel like there's very
12
    inadequate analysis of what the economic impacts are from
13
    a non-cap and trade perspective alternative.
14
15
             And we just -- as a Board member, I feel that I
16
    couldn't support something that was vaguely stated to be
    the best for the economy without real strong data. And I
17
18
    think that's where we are. And if it's about the same,
    then why not try something that is potential going to be
19
20
    much better for our communities from a health perspective.
21
    So that's what I would ask us to be open to as we move
22
    forward.
             MODERATOR LUCERO: All right. I have 5 people in
23
    the queue and we've got about 3 minutes on this topic,
24
25
    before we start interrupting the next one.
```

```
48
             (Laughter.)
 1
 2
             MODERATOR LUCERO: So if this meets into other
    sectors, think about that.
 3
             So, Katie.
 4
 5
             EJAC MEMBER VALENZUELA GARCIA: I will be quick.
 6
    I think -- I appreciate the comments, because one of the
 7
    things that we've been talking about an overarching themes
8
    and that we mentioned at the Board meeting is that we have
 9
    no real clear vision of what 2050 looks like, what type of
    economic activity is going on, what type of jobs are
10
    people doing, what do these communities that have been
11
    built around oil, and ag, and biomass, what are they going
12
    to look like if we shift to something cleaner?
13
             And that is beyond looking at just cap and trade.
14
15
    That is beyond -- I mean, we've brought up questions about
    what about the air monitors. You know, what if there's
16
    miles between air monitors, and in the middle we have this
17
18
    census tract with really high respiratory illness death
    rates?
19
20
             Like something has got to be wrong, if we're
21
    seeing really high respiratory illness death rates
    somewhere, and we're missing it. But what struck me, when
22
    I joined this Committee -- obviously I wasn't on the first
23
    2 -- was when I read the recommendations of previous
24
25
    EJACs, a lot of the responses were just oh, well, that's
```

```
49
   beyond the scope of the scoping plan, which I found kind
 2
   of like contradictory in terms, but -- like we're scoping,
    so why can't it be beyond the scope of something that's
 3
    supposed to scope what's possible.
 4
 5
             But I didn't see a lot of effort to really say,
 6
    well, this is where it ties in. This is where our
7
    accountability as ARB, even though we're just looking at
8
    the scoping plan, we're going to commit that in our air
 9
    quality monitoring system. We're going to be looking at
    how to address this concern. Like it was just, oh, beyond
10
    the scoping plan, done. And I'd like to see that
1 1
    conversation stop as we move forward into this next
12
13
    scoping plan process.
            MODERATOR LUCERO: Thank you for being quick
14
15
    Katie. Remember, we do have a court reporter. Not too
16
    quick.
17
             (Laughter.)
18
             MODERATOR LUCERO: Eleanor.
             EJAC MEMBER TORRES: Just really quickly, I did
19
    leave -- and I don't want to delay the issue. I agree,
20
21
    again, Martha, that -- and everyone else it's talking
22
    about the data, and, I mean, the OEHHA report just --
23
    yeah.
             I have made some comments, but I sent to Trish
24
25
    virtually a list of things that at least our team in San
```

```
5.0
    Bernardino is looking at, in terms of the different plans
 2
    have been out there evaluating cap and trade and other
    scenarios, as well, including a report from Driscoll on
 3
    U.S. Power Plant Carbon Standards and Clean Air and Health
 4
 5
    Co-Benefits; EDF report on Public Health and Societal
 6
    Economic Benefits; the Greenlining Institute, California
 7
    Climate Investments Reducing Poverty and Pollution; from
 8
   MIT Joint Program, Market Versus Regulation: The
 9
    Efficiency and Distributional Impacts of U.S. Climate
    Policy Proposals by special Sebastian Rausch and Valerie
10
    Karplus; The Climate Trust: An Evaluation of Potential
1 1
    Carbon Pricing Mechanism of the State of Oregon
12
    Legislation;
13
             An Analysis of Public Health Impacts of the
14
15
    Regional Greenhouse Gas Initiative prepared by ABT
16
    Associates; EDF Carbon Market California, a Comprehensive
    Analysis of Golden State and Trade Program, Year 2014.
17
18
             And some other reports that we've been slowly but
    surely making our way. I say this only because, I mean, I
19
20
    feel very conflicted. On one hand, I hear my colleagues
21
    expressing a real concern with cap and trade, but at the
    same time, I'm actually seeing extraordinary amounts of
22
    benefit in my community that does address public health
23
    and the work towards reducing air quality, as well as
24
25
    economic opportunities.
```

```
51
             So I just want to bring that out, and if
 2
    possible, perhaps that list could be included in terms of
    passing that out through my colleagues, because I would
 3
    really love to get their input on some of these reports as
 4
 5
    well.
 6
            MODERATOR LUCERO: So I have Luis, Kevin, and
 7
    John -- no, not John. I thought I saw John -- and Phil.
8
             A minute or less, and then we need to move on to
 9
    the next one. Sandra, yours was before, right?
             (Laughter.)
10
             Luis.
1 1
             EJAC MEMBER OLMEDO: I just want to add to the
12
    conversation of metrics and monitoring, and going back
13
    to -- I hope I don't misquote, but Board Member De La
14
15
    Torre mentioned, what are the short-term goals. I really
16
    think these metrics are short-term. And I just wanted to
    cite here, it's like a budget adjustment that was done
17
18
    last year. And it says that $2.3 million were allocated
    to add more monitoring, and it says here, such as
19
    enhancing our community monitoring for toxics methane,
20
21
    particularly near disadvantaged communities, and other
    highly impacted communities, such as Porter Ranch near
22
    Aliso Canyon.
23
             So clearly, I mean, there's a way to expedite, to
24
25
    fast track these types projects. I just think there's got
```

```
52
    to be the interest and the will -- willingness of the
 2
    agency to do this. And so I just wonder, why isn't it
    happening already. I mean, it seems like it's been years
 3
    that these low cost technologies, or just other types of
 4
 5
    regulatory monitors that may be cost effective to deploy
 6
    in disadvantaged communities could happen right now.
 7
             So I'm just wondering why wait? Why does it have
8
    to be a 10-year plan, and then 5 years later, then we're
 9
    now 15 years. I mean, these things just take too long
    and -- and I hope that after today, you know, given that
10
    all board members are here, EJAC members are here, it's
1 1
    been an active discussion. There's plenty of evidence,
12
    plenty of research out there that can at least get the
13
    agency involved, and not try to find out where are we
14
15
    going to get the money from.
16
             And I'm taking more than a minute.
             But I know that's part of the argument is where
17
18
    is the money going to come from? Well, somebody found
    $2.3 million to take to Aliso Canyon or Porter Ranch. I
19
    mean, the money is out there. I mean, there's, you know,
20
21
    this, you know, funds. But anyhow. I hope that we can
    walk away with some concrete directive, I guess.
22
23
             Thank you.
             MODERATOR LUCERO: Kevin.
24
25
             EJAC MEMBER HAMILTON: So I think it -- yeah.
```

1 1

5.3

So there's a sense of urgency here that we feel with regard to the health consequences. I don't think I was -- I use the word "underwhelmed" with, I guess -- and I won't do that lightly, because I don't like to cast aspersions on my colleagues in the public health arena, but I really was by the OEHHA health report.

I thought that it didn't well illustrate the consequences of greenhouse gases, especially things like black carbon, which were kind of glossed over and passed off as this is well understood. Well, if it's well understood, then you need to enumerate it in the report.

And what we find is a lot of, especially with carbon, black carbon, and -- I'm talking about carbon in terms of CO2, and black carbon in terms of especially elemental carbon, and methane, these are produced by industries or by activities that also produce criteria plants by their very nature.

So with elemental carbon, you're talking about combustion, whether it's pressure combustion — a fancy name for diesel — or other compressed gases that don't use a spark or spark-ignited combustion, or in the case of these other — of CO2, again massive amounts of CO2 are produced as part of oil and gas production, for instance, and also as part of combustion. So there are markers for the things that happen to your health.

1 1

5 4

And we use markers all the time in health. We use these proxies, because we can't measure the direct impacts of this particular insult. So we have to use something else that is always riding along with that one, so to speak.

And so we do have that information. We need to talk about that. I'm seeing reports that are being -- that are clearly illustrating long-term genetic consequences to this pollution that we're breathing. We see work out of -- out of Stanford and other places that's telling us that especially in the region I live in in the San Joaquin Valley, we may be affecting children's immune systems at the fetal stage, and this effect may last for life compromising their immune systems.

There is a sense of urgency here. We know it's affecting the health of those of us who are breathing today, but the consequences to these young ones, who are not equipped to defend themselves in any way, shape, or form, and yet are going to live with these consequence potentially for life.

And as we've learned in the L.A. Children's Study, where long-term association with things like ozone are causing their lungs to be underdeveloped -- which, by the way, when your lungs are done at 23, they're done for life. So if they're not where they're supposed to be

```
55
    then, you don't get to build more back later on.
 2
             So there's an urgency to this that I feel, and I
    think everyone should, to get this done and get it over
 3
    with. And we need to think globally, and we need to
 4
 5
    consider all the opportunities. One of the things with
 6
    the different scenarios I said is, well, let's combine
 7
    those.
 8
             I see the red flag. Trust me, I do Stephanie.
 9
             All right. Thank you.
             BOARD MEMBER SERNA: So, so far, I really
10
    appreciate all the comments that have been issued. And I
1 1
    know we need to move on, but I think it's really important
12
    that Katie's questions about, you know, the scope of the
13
    plan and kind of this boilerplate, or what's perceived to
14
15
    be as a boilerplate response, you know, something is
16
    outside the scope of the plan, needs to be addressed. And
    I'm looking to Richard or Edie before we go further,
17
18
    because I think that's a real structural respectful
    disagreement that really warrants an answer at this point.
19
20
             Otherwise, I think it's going to -- at least for
21
    me it's going to hang out there like a footnote to the
    rest of the discussion.
22
             EXECUTIVE OFFICER COREY: Supervisor, let me take
23
    a stab at this, because I think it is an important
24
25
    question. And I was actually -- and a few of the
```

```
56
    commenters, both the EJAC members and Board members
2
    touched on this, and that is that the nature of the -- of
    the problem matters. And what we're really talking about
3
    in many cases are community-focused problems. And that
4
5
    could be elevated exposures to chromium. That could be
6
    associated with the combustion of fuel. It could be a
    refinery. It could be, in some cases, an auto body shop.
7
8
             And what I'm getting at is -- and I think you're
9
    right in terms of the recognition in the scoping plan, not
    just a punt, that, hey, this is outside of even
10
    necessarily climate policy. I think one strategy to me is
1 1
    clear is that, one, there's a lot of arrows in the quiver
12
    to deal with issues. And if the point is there are not
13
14
    enough, we should be talking about that.
15
             The next point is it's -- it is not one strategy
16
    that gets at even everything I just talked about. And I
    think the point is a clear characterization, these are the
17
18
   problems. These are the issues, and I think I named a few
    of them. And I think that leads you pretty quickly to why
19
   haven't they been addressed, and what are the existing
20
21
    levers?
22
             Are the permit -- local permit limits not tight
    enough? Do we not have a toxics rule? Is the toxics rule
23
    that we have not getting it done? Because there are those
24
25
    authorities, and there are those instruments that could be
```

```
57
    more effectively called out, but to me ultimately it's
 2
    about action, and I think -- I think a clear
    characterization of the issues, and the potential
 3
    responses. And I think where that leads, honestly is in
 4
 5
    some cases do the climate actions, can they get at it?
 6
    Probably in part. In some cases maybe even effectively,
 7
    but not completely. I think it's -- but then it leads you
 8
    pretty quickly to what are the options?
 9
             So I think a more complete characterization of
    the issues and what the responses, and even if the
10
    response is not a GHG measure. Does that make sense?
11
             BOARD MEMBER SERNA: Thank you.
12
13
             MODERATOR LUCERO: Okay. So we have a couple of
    commonalities that I'll start plotting on the Board, but I
14
15
    want to make sure we get to the next group, and then we'll
16
    confirm that everybody agrees with the commonalities that
    are kind of coming out of the discussion.
17
18
             So let's move on next to energy, green buildings,
    and water.
19
20
             Microphone.
21
             EJAC MEMBER TORRES: All right. So our group
    looked at energy. And some of the highlights that we're
22
    looking at is a need to get away from fossil fuel and
23
    start bringing renewable sourced energy to our specific
24
25
    communities, as well as lead with community-based
```

1 1

5.8

innovation on all the issues that we're dealing with, in terms of energy, green building, water.

Energy in terms of we think it's important to -if we're going to be purchasing energy from other states,
we need to be purchasing clean energy -- from clean energy
sources. We need to runoff of more solar, and not be so
dependent on the utility systems.

We also need to look at energy pilots for whole communities, so we can start articulating local generation and taking -- coming away from the distributed system.

Also, looking at retrofits -- and all of these kind of overlay with each other also. Retrofits that can allow -- or upgrades that allow for energy usage in terms of charging stations, as well as being able to handle your microwaves and everything else, so you don't blow all your circuits.

In terms of water, we were discussing the need for residential water capture systems, specifically provided to DACs. We need to be able to plumb DAC residents to use greywater, whether that's in irrigation or other ways. We also need to take all these different ideas and integrate them much more effectively.

Let me get back to green building. The group also expressed a need to emphasize -- more emphasis on retrofits, not just new builds. Looking at 50 percent

```
59
    more efficiency with green builds.
 2
             All these strategies help bring us to a place of
    dealing with the economic issues, in terms of jobs, and
 3
    even potential businesses when we start talking about
 4
 5
    weatherization of homes, or even as my colleague Rey León
 6
    was saying, being able to switch out streetlights for
 7
    instance. These are different skills that we could
 8
    certainly be training others to do, so that they can be
 9
    more job ready.
             But like I said, these are -- these strategies
10
    really address the need -- address how we can better our
11
    air quality, provide more economic opportunities, and
12
13
    certainly better public health to our communities.
             One other -- a couple of other things was that we
14
15
    were -- I was asked to also say that we -- we need to
16
    start looking in terms if we're going to be bringing these
    investments to the communities. They cannot be
17
18
    reimbursements. They have to be direct to install,
    because our DACs cannot afford a reimbursement process.
19
    We also need to integrate forest management and upper
20
21
    watershed management for suppression of mega fires.
22
             If we do this, we get water supply and quality --
    we -- if we do this, we can start really shoring up our
23
    water supply and the quality of our soil.
24
25
             That's it in a nutshell. What do you think? Did
```

```
60
 1
    we get it.
 2
             EJAC MEMBER BAILEY: (Nods head.)
             EJAC MEMBER TORRES: All right.
 3
             (Laughter.)
 4
 5
             MODERATOR LUCERO: So we -- for those that are
 6
    interested, this isn't -- it starts on page 8, the
 7
    green -- energy, green buildings, and water discussions
8
    from the EJAC.
 9
             Are there any questions in terms of -- and we'll
    pull up for those that were at the meeting, these were
10
    some of the key recommendations that you saw at the
11
12
    presentation in January, but are there any specific
    questions from Board members?
13
             Judy.
14
15
             BOARD MEMBER MITCHELL: Thank you, Eleanor, for
16
    those comments.
17
             I think some of the recommendations that are in
18
    this part of the -- of your document, they're being done.
    They're being done in other sectors in other ways. Let me
19
20
    just mention that the County of Los Angeles is now forming
21
    a community choice aggregation plan for energy. And
22
    they're right now in the process of finalizing the joint
    powers agreement. My city has signed on to that. And
23
    there will be an opportunity in the near future for other
24
25
    cities in Los Angeles County to sign on to that as well.
```

1 1

So that's the beginning of getting more renewable energy into our communities, and giving communities at street level the opportunity to decide what mix of energy they want in their community. It's also an avenue to get distributed generation into neighborhoods. And there are -- there's a number of entities that are also within L.A. county working on distributed generation.

So some of these things are happening. They may not be happening right here on the -- in the scoping plan you're not seeing them there, but they are being done. And, you know, zero net energy by 2020 is now the rule, and so we're going to see that enacted as well.

So I think that finding the place where some of these things can be done, finding the agency, finding the communities where they are already being implemented is important, and will help us get to where we want to go. There's a lot of things in your document that I think are being done, but maybe not being done in the scoping plan or by the Air Resources Board. Some of those belong to other agencies and to other -- with other responsibilities.

MODERATOR LUCERO: Did you want to provide of why it might be something you want to just comment on.

 $\hbox{EJAC MEMBER TORRES:} \quad \hbox{Thank you very much for that} \\ \hbox{information.} \quad \hbox{And I think that's very true that $--$ I mean,} \\$

```
62
    our experience on the ground has been that there are
 2
    different agencies doing different programs. And what
    we've tried to do is take a look at that very much like a
 3
    menu and develop a suite of strategies for our committee,
 4
 5
    so it -- communities. So I suspect that's very much about
 6
    what you're talking about.
 7
             Thank you.
 8
             MODERATOR LUCERO: Mary.
 9
             CHAIR NICHOLS: Well, I agree with Judy's
    comment, but I don't think it fully responds to the
10
    recommendation, or at least to how I think the
11
    recommendation is intended, in the sense that -- and this
12
    is -- this is part of the dilemma I think that we've had
13
    with the scoping plan all along. The scoping plan has
14
15
    taken on kind of a life of its own, as a -- as more than
16
    just ARB. It's certainly -- more than ARB or more than
    even -- even the State of California, in the sense that we
17
18
    acknowledge or take credit for or, in some ways, try to
    push in incentivize or whatever actions that really need
19
    to be taken by other people, and not just -- not just by
20
21
    ourselves.
22
             This is not something that we're exactly well
    equipped to do. And I don't want to whine about
23
    resources, but it is true that, you know, since AB 32
24
25
    passed, we've hired people and developed expertise in a
```

```
63
    whole lot of topics that we didn't do anything about when
 2
    I first got to ARB. I mean, forestry? You know, ARB has
    somebody who actually understands something about
 3
    forestry? Yeah, it's great, but, I mean, it's not
 4
 5
    exactly our mandate.
 6
             So I guess, by way of a comment, I would say I
 7
    would be hesitant to include in a scoping plan that, was
 8
    an official direction, if you will, for the State of
 9
    California things that are totally outside our legal
    authority to do.
10
             So let's just take for example the reduction in
1 1
    use of petroleum. I mean, we know we have to get to the
12
    reduction in the use of petroleum, and to get to big
13
    numbers of alternative kinds of vehicles, but we don't
14
15
    have the -- we tried and did not succeed in getting the
16
    authority to just mandate a certain amount of reduction in
    petroleum. So that -- that tends to have an impact on how
17
18
    we put things into the scoping plan, I think.
             At the same time, maybe what we could or should
19
    be doing is a better job of assessing what else is going
20
21
    on out there in the landscape, or could be going on with
    some additional encouragement, and just putting it into
22
23
    the scoping plan.
             You know, I think we have been maybe a little bit
24
25
    hesitant about -- especially when it comes to stepping on
```

```
64
    the toes of local government, you know, adding in things
 2
    that are already going on. But the fact is there's a --
    we know we -- we not only are expecting, but, you know,
 3
    counting on a lot of action that's happening there.
 4
 5
             So I guess maybe that's just intended to get a
 6
    response.
 7
             MODERATOR LUCERO: Hector.
8
             BOARD MEMBER DE LA TORRE: First of all, just an
 9
    announcement, John had to step out to go talk to the
    Maritime Association and tell them about the perils of
10
    pollution and diesel.
11
12
             (Laughter.)
             BOARD MEMBER DE LA TORRE: He'll be back.
13
             And I think Mary's point is following on what I
14
15
    tried to say at the outset, which is, not just in terms of
16
    time, short, medium, long term, but also in terms of
    category what issues are cap and trade related, what
17
18
    issues are regulatory, what issues are toxics related,
    what issues are GGRF related? Where do they belong?
19
20
             And if it's not within our purview at CARB, then
21
    who is responsible for it, and identify again the breadth
    of tools that we have to address problems in EJ
22
    communities, because as we talked about last week
23
    Berkeley, there is no equity here. And so we need to
24
25
    encompass all of it.
```

2

3

4 5

6

7

8

9

10

1 1

12

13

14 15

16

17 18

19 20

21

22

23

2425

65

Maybe it's not -- some of this stuff isn't going to be in the scoping plan, but we need to identify where it belongs and who's supposed to be doing it, and work on it from that perspective of making sure we're as inclusive as possible wherever that is, wherever it fits, so that it gets done, because it can't just be a situation where we put stuff into the scoping plan, and then whatever doesn't fit gets left out, and ignored, and then we'll be back here 5 years from now on the next scoping plan having this same conversation. MODERATOR LUCERO: Just because I'm a facilitator, and -- so there's been 2 kind of comments of, okay, so what do we do with the stuff that doesn't fit, what's the next steps? I'd like the Board to kind of think about, and maybe if you have like -- so who would take the lead in

Kevin.

end of the day.

EJAC MEMBER HAMILTON: So briefly, I understand what people are saying, you know, trying to respect other agencies, local jurisdictions. The Governor came out a few years ago, and said not only are we going to do this, but we're going to use interagency cooperation as a way to

doing that, and kind of identifying that and reporting it

out. And you don't have to answer now, but maybe by the

```
66
    do it.
 2
             And I am going to mandate that these agencies,
    these 13 agencies, cooperate with each other, share
 3
    information, and work together toward this shared goal
 4
 5
    that we all have. Now, I've been engaged in a lot of
 6
    that. We're in meeting with these different agencies.
 7
             And by the way, I want to call out Trish Johnson
8
    while I'm here, and her boss Floyd, but Trish in
 9
    particular, for arranging deep dives for the EJAC with
    those actual agency experts from those agencies from these
10
    various sectors, for 3 and 4 hour, if you will, just nuts
1 1
    and bolts of transportation, forestry, energy from all the
12
    different aspects of energy. And I think they were
13
    surprised that we were just eating it up, and crying out
14
15
    for more. So they actually arranged a second level of
16
    deep dives, where we could go even deeper and learn even
17
    more.
18
             And I would recommend that to all of you, should
    you have that opportunity. And then going to
19
20
    transportation planning meetings. I had the opportunity
21
    to participate in the California transportation plan
    advisory that just came out for both the rural communities
22
    and the rest of California, and seeing how that is not
23
    really translating this idea of working together and
24
25
    taking health into all of these agencies. They're really
```

```
67
    struggling with that, by the way.
 2
             So the leadership from this agency, which is the
    lead on this particular area that's -- that really
 3
    embraces the Governor's vision of the work it should do,
 4
 5
    should lead them as well, should give them the queues that
 6
    they need, the information that they need, and call on
 7
    them for their expertise to inform that.
 8
             Now, does that -- this should have been happening
 9
    right along. I assumed since it was happening with us, it
    was happening with you folks, too. But this is the way
10
    the scoping plan does need to be built. It needs to be
1 1
    built in an interagency fashion, all leading to this goal
12
    of reducing these greenhouse gases, and improving the
13
    health of our State and our world
14
15
             So the opportunity is there, the expertise is
16
    there. It's at your beck and call. One thing I found is
    when we ask them, they're happy to share, and happy to
17
18
    come over and talk about how this complicates their lives
    and where we can make it all work.
19
20
             MODERATOR LUCERO: Katie.
21
             EJAC MEMBER VALENZUELA GARCIA: Thank you.
    agree that -- I understand the hesitancy. Some of this is
22
    too specific and it's too local level, but there is this
23
    tension that we feel in recognizing to reach these
24
25
    ambitious targets, we're going to have to do everything
```

1 1

6.8

we've done better, and more, and even more than what we've ever done before if we're going to get anywhere close to reaching these targets.

So funny story. You know, I help run this urban ag coalition locally that just passed some ordinances, but I kill succulents. It is totally outside of my area of expertise to do urban agriculture. It's not what I do well. I can't grow anything. But I recognize a need in the community, and I made a commitment to help work with the people who do know how to do that to make it done.

So I don't think it's outside of ARB's authority to commit within the scoping plan to work with agencies who have different expertise or authority. And I also particularly don't think it's beyond the scope of the scoping plan for ARB to name when you have to work with the legislature to address authority gaps.

Say we've seen an issue. We don't have the authority to address it. We don't think other agencies have the authority to address it, and we are committing to work with the legislature to figure out how to address this issue. Those are types of commitments that I think can be made within the scoping plan, even to say, look, this isn't within AB 32, but we recognize that there's a gap and we're going to commit as ARB to making sure that that gets connected whether it's with the legislature or

```
69
    with another agency.
 2
             And I want to name the agreement again. I've
    seen notes pop up, which I like, that I think we're all in
 3
    agreement that there is a limit to what the scoping plan
 4
 5
    under SB 32 can do, but that we don't want to let that
 6
    limitation stop us from naming within the scoping plan
 7
    when there's opportunities for this out -- this
 8
    collaboration of other programs, other agencies in the
 9
    legislature that's still needed to reach the 2050 goal.
             MODERATOR LUCERO: Martha, I saw your card go
10
1 1
    down, so I'm going to go to Diane.
             BOARD MEMBER TAKVORIAN: Yeah. I just wanted to
12
    build on what Hector said because -- and I guess what
13
    Katie was saying as well, is I would like clarification,
14
15
    because I -- I absolutely agree that if there are areas
16
    that the scoping plan or the agency does not have
    authority for, but we understand that those are things
17
18
    that should be done, that we -- we include those. And
    that's what I heard you saying to say that in order to get
19
20
    to our goal, we're going to need to include -- these
21
    agencies will have to take these actions.
22
             But I also see that already in the scoping plan,
    and I also think that some of those things like
23
    implementation of SB 350, implementation of freight action
24
25
    -- the Sustainable Freight Action Plan are here and are,
```

```
7.0
    to some degree, relied on in order to reach our goals.
 2
    I feel like there's inconsistency here, that we're -- that
    we are citing them, which is a good thing, and including
 3
    them as part of our plan, but in other areas we're
 4
 5
    hesitant to do that.
 6
             And if anyone has that -- some clarification
 7
    about that, that would be appreciated.
 8
             VICE CHAIR BERG: I really appreciate the level
 9
    of the conversation, and I'm just wondering as we look
    back on when we first started the scoping plan, two
10
    generations ago, and had all of these agencies, because we
1 1
    knew at that time we were going to be collaborating. And
12
    it was a totally new experience for all of us. And it
13
    seems to me how do we measure what progress we have made,
14
15
    because when I think back at when we started the first
16
    scoping plan, there -- we really were miles apart, and it
    was brand new to all of us, and it seems to me that many
17
18
    of our State agencies have come around and are embracing
    quite a few different lines of thinking. They're looking
19
    at this in different ways as they're putting their
20
21
    programs together.
22
             So how do we measure in a way that we can see the
    progress, recognize what we still need to do, and then
23
    specifically be able to say what we're going to be able to
24
25
    do over this next period of time, so we, in fact, see
```

```
7.1
    progress rather than kind of talking about it in a way, as
    if we hadn't moved at all in the lasts 8 or 10 years?
 2
             BOARD MEMBER DE LA TORRE: To Diane's question, I
 3
    think it's sustainable freight is relatively new.
 4
 5
    less than 2 years old, and it's an official initiative
 6
    from the Governor's office.
 7
             CHAIR NICHOLS: It has an Executive order that
 8
    created it.
 9
             BOARD MEMBER DE LA TORRE: And that's -- so it's
    not something we made up. It's something that we were all
10
    told you should be doing this. And so I think that's
11
    probably why it's in there, is because it's this official
12
    thing that was given to us by the Governor's office. And
13
    so these other things we're talking about, they would be
14
15
    us telling these other agencies thou shalt do this, or you
16
    should be doing that, and there's a sensitivity to
    that -- that kind of approach that I've seen at CARB.
17
18
             And it's a gentle dance that needs to happen with
    those kind of things, where we're the ones who are taking
19
20
    the initiative as opposed to the Governor.
21
             MODERATOR LUCERO: Martha.
             EJAC MEMBER DINA ARGÜELLO: Can I just --
22
             BOARD MEMBER TAKVORIAN: I'm sorry. I appreciate
23
    that. And I -- I -- you know, appreciate the dance, and,
24
25
    you know, the Governor set the goal. And if CARB is
```

```
7.2
    charged with achieving the goal -- setting out a plan to
 2
    achieve the goal, and CARB can't do that alone, and there
    are these other agencies that need to step up, or there's
 3
    other parts of the plan that need to step up -- I mean,
 4
 5
    maybe they're not the agencies, but I don't -- I don't
 6
    know. I mean, maybe that's a conversation the Board needs
 7
    to have about how politically sensitive is it to say these
8
    are areas that we don't have authority over, but they need
 9
    to be addressed, because otherwise we don't get to the
10
    goal.
             BOARD MEMBER DE LA TORRE: I'm all for that.
1 1
             I know I said that to Kevin's point as well. We
12
    get it, but there's --
13
             MODERATOR LUCERO: You need your mic, Hector.
14
15
             BOARD MEMBER DE LA TORRE: To Kevin's point as
16
    well, I -- I'm very much one of those people who wants to
    just, you know, let's go, but there is a sensitivity that
17
18
    I have experienced a few times.
19
             (Laughter.)
             BOARD MEMBER DE LA TORRE: And so that doesn't
20
21
   mean we don't do it. It just means we have to be clever
22
    about it.
             MODERATOR LUCERO: So I'm actually -- I'm going
23
    to put, as a parking lot, for us to discuss a little bit
24
25
    later, because I suspect it's going to come up over and
```

```
7.3
   over again, is this concept of how can the scoping plan be
    creative for calling out those other agencies or
 2
    authorities that are not within the purview of ARB, but
 3
    are responsive to the recommendations and the things that
 4
 5
    EJAC is saying needs to be done?
 6
             So we need to have that conversation more. It's
 7
    going to come up throughout the sectors. I can tell you
8
    right now. So that's going to be a discussion item for
 9
    us. So if you have comments on that, let's hold those.
             And then are there any other comments or thoughts
10
    in terms of energy, green buildings, water?
11
             Katie I your card up.
12
13
             Martha.
             EJAC MEMBER DINA ARGÜELLO: No, it was not about
14
15
    that actually, so maybe I'll hold off.
16
             MODERATOR LUCERO: Why don't you put it out here
    and then we can plop it on the Board, and then we'll move
17
18
    to the next one.
             EJAC MEMBER DINA ARGÜELLO: So as a
19
    self-appointed historian, I wanted to say that the first
20
21
    EJAC said several things. One, adopt standards and
    regulations, because we used to say thou shalt not
22
23
    pollute, it works; providing incentives, and putting a
24
    price on carbon via a carbon fee.
25
             And the reason that we made these
```

74 recommendations, and I think there's been some consistency 2 is that the trading schemes we were concerned about how they would function, but also that it crowds out other 3 things that might work. And I think we keep seeing this 4 5 concept of getting stuck on an idea that may crowd out 6 other things that work. 7 Because what's working is, yeah, you give me 8 money, I can solve a lot of things, right, but where did 9 that money come from, and what else -- what are the trade-offs for that. So I think those are really 10 important, and that it also -- what we need is really 1 1 an -- we said 3 things, trading schemes don't work and 12 they crowd out things that work; trading shifts 13 innovation; and offsets make things worse. And so that --14 15 for me, that's remained very consistent. 16 And the other thing that we used to talk about a lot is this idea that we have this opportunity to merge 17 18 and do what we do in the field, right? We talk about working intersectionally, and that means around race and 19 gender and community. But what the means, how do -- how 20 21 do institutions like this work intersectionally? 22 And I personally have heard from people from the Department of Transportation, Housing, Health, like, do 23 more, push more. I mean, they personally come up and said 24 25 push more, because we need to be doing this collaborative

```
7.5
    work. And so how do we tap into the folks within those
 2
    institutions that are ready to do that and are willing to
    take on the heavy lift of managing up within their own
 3
    institutions.
 4
             MODERATOR LUCERO: So we are about 10 minutes
 5
 6
    over. Eleanor, your card is up, did you have a --
 7
             EJAC MEMBER TORRES: (Shakes head.)
 8
             MODERATOR LUCERO: Okay. If you do not have a
 9
    comment, put your cards down.
             We have as an action item, based on earlier, we
10
    need to figure out how to get the coordination actualized.
11
             (Phone ringing.)
12
             MODERATOR LUCERO: And we've got a phone going
13
    off. All right. Right next to the facilitator.
14
             (Laughter.)
15
16
             CHAIR NICHOLS: That's me. Sorry. Sorry.
17
             (Laughter.)
             MODERATOR LUCERO: Oh, and that's what I was
18
    going to check.
19
20
             So, Katie, go ahead.
21
             EJAC MEMBER VALENZUELA GARCIA: I wanted to
    respond, Sandra, to your comments about, you know, we have
22
23
    made progress, we have made progress. And I understand
    how it might be frustrating, given all of the progress
24
25
    that I do believe has happened at the State level with
```

```
7.6
    better coordination, when you have folks like us coming in
 2
    and being like it's not happening. You know, there's
    still a lot of households in Supervisor Serna's District
 3
    that have knob-and-tube electrical.
 4
 5
             That when you go out and talk about climate
 6
    programs, like at you and say, what climate programs?
 7
    I think the gap that we're identifying here is due to lack
 8
    of community-based metrics, and that's what you're hearing
 9
    us call out throughout our recommendations, is that we
    want community-based metrics, because all of the
10
    coordination at the State level and the world doesn't help
1 1
    if households in Supervisor Serna's district still don't
12
    get benefit from the climate programs and policies and
13
    visions that we're trying to set out.
14
15
             So that's one of the big gaps that we see in the
16
    energy section of the scoping plan, and all sections
    really, for that matter. It's an ongoing theme is, you
17
18
    know, how do we set measurable things, so that we have a
    goal. Like, Martha said, staff will meet the goal that's
19
    set out. And so if we say, well, our goal is we want X
20
21
    number of disadvantaged communities households to have
    seen these types of energy improvements and these types of
22
    reductions in their energy bills, that's how the staff
23
    will craft the program, if that's the goal.
24
25
             And we haven't done a good enough job, I think,
```

```
7.7
    of identifying those community-level impacts that we're
 2
    hoping to see as a part of this big statewide plan.
             VICE CHAIR BERG: And then -- and as I look at
 3
    this and have been taking notes, access keeps coming to
 4
 5
    mind, is that it's the lack of access, the lack of having
 6
    the opportunity. Then what also comes to mind, and I know
 7
    in my own community of Boyle Heights, where do we put
8
    together the ability -- the champions who are going to
 9
    champion these things and go after them, are we expecting
    others to come in to the community? And I know that's not
10
    a popular thought.
1 1
             And so it's that grassroots and how do we develop
12
    those champions with the resources they need, the
13
    knowledge they need to be able to really spur on this
14
15
    community engagement, involvement, and economic
16
    development? So putting these all together. If we could
    come up with that, we would get a Pulitzer Prize of some
17
18
    sort.
19
             (Laughter.)
             MODERATOR LUCERO: So I'm going to point out,
20
21
    because I know based on EJAC discussions, some of the
    recommendations were trying to get to that, that how do we
22
    build the grassroots up, that question you just asked.
23
             So maybe one kind of homework for us to think
24
25
    about or hear is what is missing in that EJAC
```

```
7.8
    recommendation that gets to that point of, well, this is
    how we see it can be done that the AR -- maybe ARB or ARB
 2
    staff aren't -- aren't kind of seeing. So let's think
 3
    about that.
 4
 5
             Let's do Eleanor's question, and then move to the
 6
    next sector.
             Okay. It just means we have less time for the
8
    other.
 9
             So Eleanor and then Mari Rose.
             EJAC MEMBER ROSE TARUC: Really. So -- so there
10
    is -- our recommendations are actually based on community
1 1
    experiences, particularly, you know, in this -- in this
12
    energy sector, there's so much groundwork that has been
13
    done around communities taking clean energy projects, and
14
15
    wanting more of that to happen in disadvantaged
16
    communities, whether some of that was generated by the
    green jobs movement nationally, and the funds that came
17
18
    through the stimulus funds, there's resources that were
    from the Greenhouse Gas Reduction Fund. There are --
19
    there are -- there's -- there's both experience with
20
21
    projects, job training.
             So even in Oakland, community colleges that
22
23
    have -- that have added green jobs training programs to
    the classes that they offer. So what's lacking is the
24
25
    siting of these projects and creation of these projects in
```

```
79
    the communities, because if you want to hire locally
 2
    because the projects are local, and not necessarily out in
    the desert, and big solar farms, but rather smaller
 3
    projects distributed generation, we want -- we want that
 4
 5
    signal from the State, so that this access piece is -- the
 6
    signal isn't necessarily sent yet, or it's not sent
    consistently.
 8
             So one of the things that we saw in the draft
 9
    scoping plan, or the full draft is that there's -- there's
    an acknowledgement of SB 350, and the 50 percent RPS, but
10
    it's not necessarily lifting up the equity part of that,
1 1
    which is that there are barriers to low income folks being
12
    able to access this. And so this clean energy and the
13
    economic beneftis that are part of it, and we need to
14
15
    actually lift that up to say in the energy sector, in our
16
    reducing our emissions from dirty fossil fuel energy is
    that there is a part of it that is signaling that we
17
18
    should create these projects and locate them in EJ
    communities, because there are economic opportunities that
19
    are part of it.
20
21
             So there's groundwork there, and I was part of
    the SB 535 Coalition, now called the California Climate
22
    Equity Coalition. And there's an energy committee that
23
    included local government and community-based
24
25
    organizations, and worker training groups that over 2
```

```
8.0
    dozen groups in there, that are trying to figure this out.
 2
    And so there's groundwork we need to send the signals,
    both in energy and the other sectors.
 3
             MODERATOR LUCERO: We are way over to next one.
 4
 5
             EJAC MEMBER TORRES: All right. Really quickly.
 6
    I just want to make it really clear. The issue in terms
 7
    of cap and trade -- again, this is my issue.
                                                  I would love
 8
    to hear or see more and have a robust debate with my
    colleagues, and maybe people who have experience in this
 9
    field. But the fact is I really don't want the successes
10
    of, for instance, my community being diminished in which,
11
    you know, I've got a training program we were able to do
12
    as a result of that money.
13
             And it's not about just the money. It's actually
14
15
    about how we're using cap and trade as a tool to start
16
    building greater capacity in a county where no one was
17
    really working it.
18
             And it's been a huge, huge benefit to our
    community. And I'd have a hard time talking to our
19
20
    volunteers and our community saying that it was not a
21
    benefit to them. So how do I talk to them?
22
             MODERATOR LUCERO: So it sounds like we've got --
             EJAC MEMBER ROSE TARUC: I mean, it will lead to
23
    the industry discussion also. I think there's -- there is
24
25
    confusion around the funds for climate benefits and
```

```
81
    greenhouse gas reduction that could come from cap and
    trade, it could come from a carbon tax, it could come from
 2
    a carbon fee that there are those benefits, and that there
 3
    is -- there is benefits -- then there's the program itself
 4
 5
    that is about reducing emissions and improving air
 6
    quality. And that is different than the additional
 7
    benefits that are supposed to come from the Greenhouse Gas
 8
    Reduction Fund.
 9
             EJAC MEMBER TORRES: But that's not true for my
    community though. That is not true for my community.
10
             EJAC MEMBER ROSE TARUC: Well, I think there are
1 1
    environmental justice communities --
12
             MODERATOR LUCERO: Eleanor, Mari Rose, so we need
13
    to focus on the issues. What I'm hearing from Eleanor is
14
15
    there are some benefits you are experiencing that address
16
    some of the issues with cap and trade. What I'm hearing
17
    from Mari Rose is there may be benefits. It may not need
18
    to just come from cap and trade --
             EJAC MEMBER TORRES: I'm not saying that -- it's
19
    part of the tools --
20
21
             MODERATOR LUCERO: Mic. So part -- cap and trade
    is part of the tools that you're utilizing.
22
             EJAC MEMBER TORRES: Yes.
23
             MODERATOR LUCERO: Okay. So let's -- let's
24
25
    emphasize on what you're seeing that works and then what
```

```
8.2
    you're seeing that's not working, and so we can have the
 2
    dialogue and figure out what would be the best path
 3
    forward.
             EJAC MEMBER TORRES: I don't want to diminish
 4
 5
    what my colleagues are saying. What I also don't want to
 6
    do is diminish the real benefits I've seen on the ground
 7
    with the communities.
8
             MODERATOR LUCERO: So let's just quickly, those
 9
    benefits are job training --
10
             EJAC MEMBER TORRES: Josh training, capacity
    building, volunteers, actual tree planting programs,
1 1
    because that's what we're doing, actual engagement of
12
13
    community, like a climate change task force that's being
    organized at this point, the ability to start
14
15
    understanding how you sequester carbon, and making active
16
    decisions.
             We're actually changing business as usual.
17
18
    included now in our community, right now, ten cities as
    well as 3 school districts right now who are seeking to
19
20
    get trees planted in their area. We've seen an increase
21
    in our volunteer roles from 300 to now 850 people.
22
             I mean, people are really excited in my
    community, and this gave us an ability to be able to
23
    really express what was the full scope of things we needed
24
25
    to look at.
```

```
8.3
             Not only that, but we have a real community
 2
    trying to engage in this discussion in terms of what we
    want to see in the scoping plan. And, I mean, we have an
 3
    unusual -- we have a remarkable perspective, given the
 4
 5
    fact that we are working shoulder to shoulder with our
 6
    communities to get the scoping plan out to them and the
 7
    dialogue.
8
             I don't want to go and make a decision for my
    community without talking to them first about the benefits
    or the liabilities of cap and trade, or any other
10
    strategic tools that we're using at hand.
11
             MODERATOR LUCERO: Okay. Now, Mari Rose, you
12
    mentioned that some of your concerns are going to be
13
    really well dictated in industry. So let's get to that.
14
15
    Phil, a quick comment on this dialogue in terms of green
16
    or -- okay.
17
             BOARD MEMBER SERNA: It's going to take 15
18
    seconds.
             MODERATOR LUCERO: Go for it.
19
20
             BOARD MEMBER SERNA: So I just -- for the scribe
21
    in the room that wrote down there, "How can the scoping
    plan respond to components outside of our purview?"
22
    just want to put a finer point on that. Could it include
23
    fed, State, local utilities, nonprofits?
24
25
             MODERATOR LUCERO: Perfect. Thank you.
```

```
8 4
             Okay. We'll keep adding on those. Yeah, great.
 1
 2
             All right. So Sandra yours is up, but can we
 3
    move to industry?
             VICE CHAIR BERG: (Nods head.)
 4
 5
             MODERATOR LUCERO: Great.
 6
             VICE CHAIR BERG: And Judy actually had her card
 7
    up.
 8
             MODERATOR LUCERO: Judy, go ahead really quickly.
 9
             BOARD MEMBER MITCHELL: It seems like one of the
    issues that we're addressing is how do we take the broad
10
    principles that are in the scoping plan, and the ideas
1 1
    that are here on the table from your -- from the EJAC
12
    community and actually get them working in the
13
    communities? I mean, how do we get them filtered down.
14
1.5
    And Eleanor has done it.
16
             But let me suggest that local government is a way
    to get there. Both Phil and I represent local government.
17
18
    And there are city officials, county officials, there are
    councils of government, which are part of the State
19
20
    structure that consist of cities. And they get together
21
    and do plans for their region.
22
             In my region, there is the South Bay
    Environmental Services Center, and that's what they do.
23
    They go out and they help restaurants clean up and make
24
25
    sure they're recycling, make sure that they're keeping the
```

```
8.5
    parking lots clean for -- so we don't have water polluted
 2
    into our storm drains.
             But they also make use of what is called a public
 3
    goods charge that's on every utility bill. And they've
 4
 5
    worked with Edison to get those funds into their program,
 6
    then to reuse to do building efficiency. They did
 7
    retrofits on the college campus of Dominguez College.
 8
    They retrofitted all of the dormitories, and they did
 9
    water conservation in those buildings, a number of things
    to make those buildings efficient.
10
             So there are those entities out there that can be
1 1
    utilized. And maybe we're not using them enough, but
12
    that's just a suggestion from somebody who represents
13
    local government.
14
15
             MODERATOR LUCERO: And I'm going to tag this
16
    again for the Board to think of what role the scoping plan
    can play in utilizing those other resources, or at least
17
18
    calling them out, because I think that was mentioned
    earlier as well.
19
20
             Luis, we are 20 minutes past time for industry --
21
    into industry. Is it quick or can it be moved to another
22
    one?
23
             Quick.
             EJAC MEMBER OLMEDO: I just wanted to also bring
24
25
    to this discussion about cities, not specifically to all
```

```
86
    the discussion, but I always try to plug it in where the
 2
    disadvantage isn't just individual that lives in these
    conditions. I work and live in a community that the
 3
    disadvantaged in the city, disadvantaged in our utility,
 4
 5
    disadvantaged is in the business. So I just wanted to
 6
    bring -- shed some light to that.
 7
             MODERATOR LUCERO: That's an important one on the
8
    local of -- limitations of that authority and power.
 9
             Okay. So let's move on to industry. As I said,
    we're 20 minutes over on that, but we don't want to cut
10
    that time.
1 1
             So, Mari Rose, are you doing the overview?
12
             EJAC MEMBER ROSE TARUC: I will start off, and
13
    then any members of the industry work group, anti-industry
14
15
    work group can chime in.
16
             (Laughter.)
             MODERATOR LUCERO: Go for it.
17
18
             EJAC MEMBER ROSE TARUC: So to us, the vision for
    our recommendations around cleaning up industry and
19
20
    emissions from there is really to imagine a transformative
21
    change, a transformative change because what we see in EJ
    communities right now is there's still oil drilling in
22
23
    south L.A., in Kern County. We're seeing the
    transportation of these -- the oil and gas through rail,
24
25
    and pipelines that some call them bomb trains, and these
```

```
87
    pipelines that leak to refine -- oil refineries in
 2
    Richmond, in Wilmington that explode, and are also trying
    to expand their facilities, because there are tar sands in
 3
    Canada that are available.
 4
 5
             I mean, the -- the fight by the Standing Rock
 6
   Tribe and the national attention that that has around
 7
    really keeping fossil fuels in the ground, because they --
8
    drilling for them or putting pipelines in our communities,
 9
    and certainly refining them, and releasing them into the
    atmosphere is catastrophic. And we need to stop doing
10
1 1
    that.
             And so we want to see transformative change in
12
    the communities that exist in California right now that
13
    are experiencing these impacts, and that we need a
14
15
    mechanism to reel in these industrial emissions for the
16
    improvement of these communities, and the workers that are
    in them. And the way -- what we're seeing the scoping
17
18
    plan, the way it's written is that it's -- it's -- we're
    seeing the staff or people at ARB are having a hard time
19
    imagining something different than this -- this dirty
20
21
    industrial process, and that it's more about tinkering at
    the edges.
22
23
             So right now, the preferred scenario that staff
    is offering is, you know, well, let's tinker at the edges
24
25
    and maybe we can reduce emissions from refineries by 20
```

```
8.8
              We want transformation. These facilities have
    health -- they harm kids and families that are living
 2
    fence line to them. And so we want to imagine something
 3
    different.
 5
             And I think the earlier comments about being open
 6
    to other possibilities around how we reduce the largest
    industrial stationary and mobile emissions need -- need
 7
 8
    that kind of vision. And so what we're seeing in the
    initial studies that were presented by OEHHA a couple
    weeks ago, and then a few months ago by the academics,
10
    including -- the Cushing Report, we -- one is we need
11
    better data. That data -- there's huge data gaps.
12
             And then with what they can see, there's strong
13
    correlations between GHGs and criteria toxics pollutants.
14
                                                                FebE AC-2
15
    We also see that offsets are actually outsourcing our
16
    emissions reductions from California, because over 75
17
    percent of offsets are out of state, and that we are
18
    seeing the perpetration of racism in California, because a
    lot of the facilities that are actually increasing their
19
                                                                FebEJAC-3
    emissions are in environmental justice communities that
20
21
    have higher proportion of black, brown, and Asian folks.
             And so what we need to see is an emphasis on
22
    prioritization of emissions in EJ communities, no matter
23
    which mechanism we choose, moving forward towards 2030.
24
25
    And we need to address where we're seeing this with
```

```
89
    urgency.
 1
             Oh, and part of this whole -- when Martha was
 2
    talking about the scale -- so AB 32 to us has this promise
 3
    of reducing emissions. And so those are benefits that
 4
 5
    we're seeing. And, you know, the -- the investments, you
 6
    know, whether in urban, forestry, and others we're seeing
 7
    benefits. But then there are design flaws that we're
 8
    seeing in the cap-and-trade system that are then
    contributing to the harms.
 9
             So if offsets are primarily -- the emissions are
10
    primarily outside of California that seemingly over 95
11
    percent of the allowances are given freely to polluters,
                                                                FebEJAC-4
12
    that it's an economy-wide cap, instead of a facility cap,
13
14
    and the lack of co-pollutant data that we're seeing that
15
    researchers can't even find right now, that those are all
16
    harms that -- and burdens that is tipping the scales away
17
    from our mission for environmental justice.
18
             MODERATOR LUCERO: Thank you.
             I've got Katie, Judy, Eleanor.
19
             Katie.
20
21
             EJAC MEMBER VALENZUELA GARCIA: Yeah, to
    cary-over on Mari Rose's point, when you go on to the
22
    adaptive management tool and you circle communities like
23
    Eleanor's, you circle communities like the ones my nephews
24
25
    living in in Kern County, the emissions -- the covered
                                                                FebEJAC-5
```

```
90
                                                                FebEJAC-5
    emissions are going up. And so I think our biggest
                                                               cont'c
 2
    imperative right now is to get on the same page that the
    system the way it's designed is not working the way we had
 3
    hoped, that we had hoped that we'd be proven wrong.
 4
 5
             You know, we'd hoped that the cap-and-trade
 6
    system might result in the type of reductions and
 7
    innovation that we all hoped it would. And what we're
8
    seeing is that it's not, and particularly not in some of
    our most underserved areas. And that, to us, is a really
    strong sense of urgency. It's an early indicator that
10
11
    requires action.
             Second, I want to emphasize the need for just
12
    transition investments, because when we talk about
13
14
    tinkering around the edges, we're missing the fact that in
15
    the future, we want totally different industrial jobs.
16
    Like, I want the people in the avenues in Oak -- what is
17
    that -- where is noise coming from. Is that -- okay.
18
    Thank you.
19
             Someone is calling me. I know I'm doing really
    well.
20
21
             We want a just transition to a new industry. And
    so like the Next 10 report that came out about the Central
22
    Valley that talked about benefit to our communities,
23
    right? And it talked about all these jobs that were
24
25
    growing in the Central Valley, when you looked at the
```

```
91
    methodology of that report, those were industry jobs.
 2
    Those were more people that went to high school with me in
    Oildale that were going to work out in oil fields, than
 3
    they were before the program started.
 4
 5
             So again, something else that's not working the
 6
    way we hoped it would. We'd hoped that we would see
 7
    increases in jobs in these communities for clean jobs, for
8
    clean industry, for those types of investments.
 9
             And so I think -- I want to talk about it in
    terms of like how do we start imagining what the new
10
    industry looks like, and what mechanism will get us the
1 1
    type of innovation and investments to get closer to that
12
    new industry, rather than worrying so much about keeping
13
    jobs that are putting people's lives and health and danger
14
1.5
    across -- communities across the State.
16
            MODERATOR LUCERO: Eleanor, you went down, so --
17
    okay. Diane.
18
             BOARD MEMBER TAKVORIAN: Yeah. Just quickly, I
    want to be sure that we're not confusing -- I mean, this
19
    was the danger, I think, when the Greenhouse Gas Reduction
20
21
    Fund started. And I think that we need to really be
    clear. And I think this is partly in the industry
22
    section, partly in the investment section that whatever
23
    market mechanism is selected, if there's revenue that's
24
25
    generated, there has to be a decision about where those
```

```
92
    revenues should go.
 2
             And I'll always support that those revenues
    should go to the communities that are most impacted by
 3
    greenhouse gas emissions and by pollution. The city of
 4
 5
    National City where our office is received $9,000,000 from
 6
    the Greenhouse Gas Reduction Fund in order to complete a
 7
    affordable housing project that as abandoned by the
 8
    redevelopment program that the Governor ended.
 9
             So good use of dollars, but never on the backs of
    communities that continue to suffer, and have increase in
10
    emissions of greenhouse gases.
1 1
             So let's be sure that we're separating those
12
    issues. We cannot confuse benefits that our communities
13
    absolutely should get, more money for affordable housing,
14
15
    more money for clean energy, more money to improve the
16
    quality of lifer, so that people can actually have homes
    that solar panels would actually work on.
17
18
             Most of the homes in the west side of National
    City will not support solar panels, because they're so
19
20
    poorly constructed. So we have a long way to go, but I we
21
    have to separate those conversations. And our goal is to
    reduce greenhouse gas emissions, and reduce them, first,
22
    from the places -- from the sources that are the most
23
    troublesome.
24
25
             And I think we've heard a description of that.
```

```
93
    And if there's revenue derived from whatever program we
 2
    develop, then we should determine - and I think we've gone
    a long way in that way - to how those dollars should be
 3
    allocated, and what we hope jobs will be created as a
 4
 5
    result of that.
 6
            Let's not intermix those 2 things.
                                                We have --
 7
    that's -- we have -- our goal is to reduce the greenhouse
8
    gas emissions and air pollution. So I hope we can kind of
 9
    stay on that on the industry side.
             MODERATOR LUCERO: Martha.
10
             EJAC MEMBER DINA ARGÜELLO: One of the -- you
1 1
    know, we often talk about, at our organization, being the
12
13
    public health voice for the new economy. And our allies
14
    are talking about a transformative economy, an unextracted
15
    economy. And I know that's beyond our scope, right?
16
    it isn't something we all -- I would venture that all of
    us know that at some point we're going to have to be
17
18
    serious.
19
             From a policy standpoint, are what are the
    building blocks to get us there, right, and what is the
20
21
    resources that have to be shifted?
22
             And so, for those -- and so we're impatient,
    right? And so we know that we bring you things that
23
    you're like what are you talking about, right? This is
24
25
    not what we do. This isn't how we do it, but we feel that
```

```
94
    urgency of now, right?
 2
             And so the folks who are sick in all of our
    communities, the folks who are suffering from
 3
    dis-investment, and -- or who never got any dis -- who
 4
 5
    were never invested in in the first place, right? So you
 6
    feel that urgency in and what we're doing.
 7
             But I want to know at -- when? And if not you,
 8
    who have now sort of been charged with this in someway,
 9
    right, when do we start having that conversation? And my
    fear is that -- or my anxiety -- well, both fear and
10
    anxiety, right, that the funds that we currently have are
1 1
    not going to be able to do that, right?
12
             How do we tell refinery workers, you know what,
13
14
    we're going to create a trust fund for you, because you're
15
    45, and we may not be able to train you for another job,
16
    and we know that that's true. But what are we going to
17
    do, right? Because those social costs of those
18
    refineries, we all have created and borne, right?
19
             It's like I can hate capitalism, but I really
    like shopping.
20
21
             (Laughter.)
             EJAC MEMBER DINA ARGÜELLO: So I know those
22
23
    contradictions, right? I'm just saying that there are
    contradictions, right?
24
25
             So we want to be partners with you in this grand
```

```
95
    vision. And, you know what, in this grand vision, yes,
 2
    there will be things that we're going to tell the
    legislature, that they also need to do.
 3
             But unless -- unless we find an institutional
 4
 5
    partner, we're going to be the crazy people throwing stuff
 6
    at you, right? But we're not crazy. I mean -- and now we
 7
    know -- we know that, because a lot of the things that we
 8
    said would happen have happened.
 9
             And so that's the -- in terms of industry, those
    are the -- so when we go to talk to people in Wilmington,
10
    they just want it to stop, right? And the rest of us are
11
    like, well, how are we going to drive our cars, how are we
12
    going to do this?
13
             Well, that question has to be asked. And we have
14
15
    all these other plans, right? Going full solar, all these
16
    other things, but there still isn't how are we going to
    tell a worker that we're going to protect you, and where
17
18
    is the revenue for that, and who is going to pay -- you
    know, I say that the richest industry in the world should
19
    be able to pay for that, but, you know, that's just me.
20
21
             Yeah I'm going to stop there, because I can
           But I just -- I guess I want you to know that
22
    what we're asking is big and visionary, and we're saying
23
    we can help you make that happen.
24
25
             BOARD MEMBER DE LA TORRE: I don't know if this
```

1 1

gets to that point, but it's definitely about industry and about green jobs, which has been talked about quite a bit. UCLA is doing study, even as we speak, they started last fall, on green jobs, because we don't have our arms around the big picture of what are the green jobs, how many are there, where are they, et cetera?

I expect that, at some point this year, we'll get those results. And that will -- to me, is take-off point for this conversation. We have pieces of it, little statistics, or factoids, or whatever, but we don't have a big picture of what is it? And I think that will be very, very helpful.

They're talking to labor. They're talking to government -- other government agencies, not just to us. They're reaching out and trying to have as comprehensive a picture of green jobs as possible. That gives us an idea of what's their today and things that are promising, in terms of things that there are today.

But going forward, those replacement things that you're talking about we just don't know. You know, there's a refinery in Paramount, one city over from where I live, that is now doing jet fuel that is renewable jet fuel. It's taking waste stuff and it's not oil based, and biofuel -- thank you. And they've flown, you know, a United Airlines flight from LAX to San Francisco. I'm

```
97
    sure they've done many, many since -- since last spring
 2
    when they did the first one.
             They're selling to the military for their jets.
 3
    And that is a refinery, except they're fining stuff in
 4
 5
    good -- better stuff into the fuel. And so that could be
 6
    a promising thing for those refinery workers. We don't
 7
    know. And so as this thing kind of plays itself out, I
8
    think what we're going to try to do is to identify those
 9
    things that are working in the markets and encourage
    those.
10
1 1
             And, you know, whatever we know today, we'll
    encourage today. Whatever we know a year from now, we'll
12
    encourage those, and we'll just keep going as we go along.
13
    But I think -- that's the way I perceive it to play out,
14
15
    because we just don't know sitting here today how we're
16
    going to get there.
17
             CHAIR NICHOLS: All right. We have about 5
18
    minutes left for this conversation. I've got John,
    Eleanor and then Mary.
19
20
             John.
21
             BOARD MEMBER GIOIA: Thanks. I just wanted to
    follow up. I think the challenge for all of us, right, is
22
    how develop -- it's really a couple of tiers here. One is
23
    the larger program to reduce greenhouse gas emissions with
24
25
    also revenue priority to impacted communities, but also
```

```
98
    looking at the specific toxic and criteria regulations at
 2
    the local level.
             And I say this as someone who lives in Richmond,
 3
    grew up in Richmond -- pardon?
 4
 5
             BOARD MEMBER BALMES: Just say who you are.
 6
             BOARD MEMBER GIOIA: Oh, I'm John Gioia. I serve
 7
    on the Air Resources Board. I apologize for being late.
8
    I drove up from the Bay Area from some other meetings.
 9
    And I also serve on the Bay Area Air Quality Management
    District Board and represent the Richmond area on the
10
    Contra Costa Board of Supervisors.
1 1
             So I -- let me just say, I acknowledge and
12
13
    understand the urgency for people who live in cities like
    Richmond, like myself. I had to pick up my son in the
14
15
    middle of shelter in place at the Chevron refinery. I
16
    understand what it feels like to have to pick up your own
    child, while there's a shelter in place going and an --
17
18
    and a release at a refinery. So I know that there's great
    urgency to this.
19
20
             So I think -- and I agree with the comment that
21
    we should prioritize the revenue from cap and trade for
    those communities that are most impacted. I do think we
22
    need to acknowledge that the Air Resources Board can have
23
    a large role, but won't necessarily have the only or maybe
24
25
    even the most important role on reducing toxics in local
```

```
99
    communities. I think there's an important role for ARB to
 2
    play, because frankly a lot of the specific regulatory
    authority are at the local air districts, like where I
 3
    serve, and we are enacting regulation after regulation to
 4
 5
    decrease toxics, and criteria pollutants around
 6
    facilities. And sometimes, a very specifically crafted
 7
    toxics revolution -- it should be a revolution, actually.
 8
             (Laughter.)
 9
             BOARD MEMBER GIOIA: Yes, it's a revolution.
10
             (Laughter.)
             BOARD MEMBER GIOIA: Maybe that was the right
1 1
12
    word.
13
             (Laughter.)
             BOARD MEMBER GIOIA: And by the way, you know,
14
15
    someone said we shouldn't call our regulations
16
    regulations, let's call them protections, because then
    when people say do away with regulations. That sounds
17
18
    like that's a good thing. That's doing away with
    protections. And in this case, it's protections for the
19
20
    community, protections of our public health, protections
21
    of our clean air.
22
             So we've passed a number of crafted sort of
    protection measures, I'll call them, at the local level to
23
    specifically reduce toxics and criteria pollutants around
24
    industrial facilities. So I think it's about how the Air
25
```

```
100
    Board also works with local air districts to craft, you
 2
    know, surgical measures that actually achieve these
    reductions, because I think some of the most effective --
 3
    in my 4 years -- 10 years -- or 11 years on the air
 4
 5
    district, and I realize there are different air districts
 6
    around the State, which -- with different levels of
 7
    political will to do that.
 8
             I think in the Bay Area we have been pretty
    progressive about trying to do that. We're trying to do
 9
    more. So maybe CARB's role in having some more uniform
10
    regulations around the State -- it's not fair to some
1 1
    communities who live in one air district to maybe have
12
    less protective measures for their community than folks
13
    who live around a similar facility that happens to be in a
14
15
    different air district, right?
16
             So maybe that's the role CARB can play, so that
    people around the State aren't at the mercy of whatever
17
18
    the local air district is and have unequal health
    standards. So I'm just saying it's sort of a -- it's
19
    complicated, right? And having the -- but the Air Board
20
21
    is not going to be the be-all end-all. It can do a lot,
    and it -- but it can partner or set standards with local
22
    air districts. So I just wanted to add that. And I -- so
23
    the partnership of doing this I think is really important.
24
             MODERATOR LUCERO: Eleanor and then Mary.
25
```

1

2

3

4 5

6

7

8

9

10

11

12

13

14 15

16

17 18

19

20 21

22

23

2425

101 EJAC MEMBER TORRES: I just want to reiterate. think it would be really good, and I'm certainly open to any thing that you and my colleagues or anybody else would give me. In terms of the list and the literature review, I recommend it again. I sent that to Trish, and maybe, at some point, she can send it to everybody else, as well as my comments having to do with OEHHA. MODERATOR LUCERO: So let's put that just as an action item that lit review will be passed away -- around to the EJAC, as well as throughout Air Resources Board, so that you know that that lit review has been reviewed, and the analysis of OEHHA, and then we can discuss further. EJAC MEMBER TORRES: Well, I think more importantly too is I want to have informed discussions, so I can bring that back to my community, and engage them in those discussions. MODERATOR LUCERO: Thank you, Eleanor. And then Mary, and then Hector just walked out. CHAIR NICHOLS: I want to build on John Gioia's remarks, which I completely agree with. So in the context of this discussion, I think we do want to put up on the board that talks about where we go from here, how we can make sure that districts across the State are implementing the very best in the way of toxics controls for the

J&K COURT REPORTING, LLC 916.476.3171

benefit of communities that live around the most -- the

```
102
    most egregious facilities.
 2
             I did want to say something else about the oil
    refinery situation though. And this is really to Martha's
 3
    kind of big picture comment, because I've actually given
 4
 5
    quite a lot of thought to the question of the future and
 6
    how you get there in the least disruptive way possible.
 7
             And I've been on the receiving end as -- you
8
    know, as a public official of a lot of the mobilizations
 9
    that the oil industry does every time we try to impact
    their operations in any way. And I do think that the
10
    thing that is having the greatest effect on their
1 1
    planning, and their investments, and their decisions about
12
    perhaps actually looking more seriously at alternative
13
    energy is the work that we're doing to try to get people
14
15
    into transportation that doesn't use any of their current
16
    product.
17
             I mean, the thing that's making -- even though
18
    it's tiny, there -- the fear that they have of, you know,
    massive increase in electrified transportation, not just
19
20
    passenger cars, but buses and trucks and trains and all of
21
    that, is really the thing that's impacting their planning
    for the future. And so I do want to see us doing a better
22
    job in the scoping plan, and elsewhere, of articulating
23
    that connection and that policy direction.
24
             VICE CHAIR BERG: So I really hesitated to jump
25
```

103 in here a little bit, because what I worry about, truly 2 worry about, is expectation. And when I hear expectation of green jobs, I get the impression that there might be a 3 thought that there is an economic society somewhere that 4 5 has jobs that somehow doesn't involve any risk or has some 6 ability to be able to take place day after day that 7 everybody likes and everybody is comfortable with and so 8 forth. 9 And even in these green jobs, I'm listening to Hector describe this biofuels, and I'm picturing how that 10 whole process is happening. And even though I think it 11 absolutely will be healthier, it's still going to be a 12 hard job. I think about all the electricity we're going 13 to be needing, and pulling these wires, and updating 14 15 things, and stuff. These are still hard jobs. 16 I'm just wondering if we can frame the importance of economic development around lifting up jobs that are 17 18 good wage, fair, clean, good -- best practices, things that people would be proud to participate. I think of my 19 own business and we're in the chemical field, but I'll 20 21 tell you, I have a workforce that really loves to be there. And we do a lot of things to protect our workers, 22 but we still use hazardous chemicals. 23 And so I guess I would just offer in the 24 25 discussion, as we're framing these types of things up, to

```
104
    think about specifically, so that when these jobs -- we
 2
    can create them, that we can say this is success.
             And so thank you.
 3
             BOARD MEMBER GIOIA: Can I add on to the jobs
 4
 5
    issue, at the right time, after -- at the right time.
 6
             MODERATOR LUCERO: Yeah. We are at time for
 7
    this, and I know I have 3, so each of you about minute or
8
    less. And I've got Luis, Kevin, and then John.
 9
             Luis.
             EJAC MEMBER OLMEDO: I think it's important to
10
    clarify what jobs are, because I know earlier we were
11
    talking about metrics and whether there's one metric for
12
    all communities. And I think to some extent there is.
13
    There are some unique metrics that need to be in place.
14
15
             But just an example, I live in an agriculture
16
    community. Over 100 years of policies that support that
    industry, low income, disadvantaged communities, a target
17
18
    for a different type of interest, more heavy industry,
    more chemically intense industry.
19
20
             By mitigating those pollutants, contaminants,
21
    greenhouse gases, you do create green jobs. So I think
    it's not just about setting up a solar field or wind or
22
    other, I think there's a lot of green jobs that are
23
    created by making sure that we are reducing those
24
25
    contaminants, or putting operators in place to operate
```

```
105
    those and building the capacity.
 2
             Sorry.
             MODERATOR LUCERO: That's fine.
 3
             EJAC MEMBER HAMILTON: So when I think of -- I
 4
 5
    appreciate your comments there, Ms. Berg, because I've
 6
    done a lot of jobs in my life, and -- starting with
 7
    working on the family dairy farm that's been there for 250
 8
    years. My family came over here in 1714 interestingly
 9
    enough.
             But also then being in the Navy, and talking to
10
    my friend Kevin in the hallway there finding out we're
1 1
    both Machinist Mates in the Navy, so, you know, we work
12
    pretty hard, as you can imagine.
13
             And then my first job coming out was actually in
14
15
    the steel mile I was talking about that went out of
16
    business, because what happened is it couldn't keep up
    with the future. And the Japanese were learning to build
17
18
    steel with electricity, and we still using blast furnaces,
    which, you know, create all the pollution that we're
19
20
    talking about versus the electricity.
21
             So your chemical industry as an example, I'm sure
    you take great care of your workers, and it's a great
22
    place to work, and they've got a good job. And I'm also
23
    equally sure, because of your position here, that you make
24
25
    sure that the waste you're talking about is appropriately
```

```
106
    dealt with, and doesn't become a hazard to the community
 2
    around it. We will always need those things. This table
    here, this folio, all this stuff here, we need all this
 3
    stuff. And it's not a pretty process to make most of it.
 4
 5
             So when I think about jobs, I don't call them
 6
    green jobs. I call them good jobs that come from a green
 7
    energy industry. So it's creating another industry.
8
    going to create a lot of reductions in the amount of
 9
    insults that we have to deal with from industry as a whole
    that doesn't take the kind of care you do with your
10
1 1
    industry.
             So that's what I'm -- when I'm talking about
12
    jobs, I really hesitate to use the word green jobs, but
13
    that's really what I -- what I mean when I'm talking about
14
15
    it. I think you mean the same thing, right?
16
             VICE CHAIR BERG: I do with all of the comments.
             BOARD MEMBER GIOIA: I think this discussion of
17
18
    jobs is important. And again, ARB is not going to be the
    total be all on this, I think -- but it is about how the
19
    State can work together among its various agencies with
20
21
    local governments to develop the transition. I think
    people call it the just transition. I think we can get
22
    caught up labeling it green jobs, or this job. It's
23
    basically the jobs that are going to develop as this
24
25
    energy system shifts away from a fossil fuel based system,
```

```
107
    right, whatever they are.
 2
             Some of them will be industrial type jobs to
    support a new renewable source of energy. But whatever it
 3
    is, it's trying to understand what training skills are
 4
 5
    needed, so that we could help train individuals for the
 6
    new jobs that will become available. I hear from folks in
 7
    my own district, folks who are trained to install solar,
8
    who are looking for more opportunities to install solar,
 9
    to individuals who work in a refinery who say, okay, what
    skills can I have to transition if it's going to be a
10
    non-refinery job well off in the future.
11
             I just -- I think we need to respect that we want
12
    to help those -- if there are going to be less jobs in the
13
    existing sort of fossil fuel sector over time, how do we
14
15
    help folks transition to other jobs, and then how do we
16
    help new people coming into the job market for the newly
    developing. And so I really think it's going -- it's a
17
18
    larger discussion than just this climate -- the climate
    change plan. It's how we sort of work together generally
19
    as the -- this is a changing economy. It goes even beyond
20
21
    our energy system. So we're a part of that discussion.
22
             MODERATOR LUCERO: Diane, do you have less than a
23
    minute on jobs?
             BOARD MEMBER TAKVORIAN: Yes.
24
25
             MODERATOR LUCERO: Okay. Because we are over --
```

```
108
    or sorry, industry. Go ahead.
 1
 2
             BOARD MEMBER TAKVORIAN: Okay. I just wanted to
    lift up 2 things. One, I received the staff briefing for
 3
    the scoping plan presentation that will be made tomorrow,
 4
 5
    yesterday, and was appreciative of a description of an
 6
    analysis of the cap-and-tax alternative. And I thought
 7
    that that would be helpful for the folks that are here
8
    today to hear about, because I was heartened by some of
 9
    the research and analysis that was going on there. And I
    thought that it -- because Emily, who was doing the
10
    briefing, talked about a cap on all sectors and that there
1 1
    would have to be development for that.
12
13
            And I thought it corresponded well with the use
    of the loading order for industry sectors that is in the
14
15
    EJAC recommendations, that we're talking about a cap on
16
    all industry sectors in priority order in terms of their
17
    emissions.
18
             So, one, I wanted to hear from staff if there's
    something that you can provide to all of us on the
19
20
    cap-and-tax analysis that you're doing, and perhaps then
21
    from EJAC on the loading order recommendation.
             MODERATOR LUCERO: Do we have any thoughts from
22
    staff or -- go ahead, Richard.
23
             INDUSTRIAL STRATEGIES ASSISTANT DIVISION CHIEF
24
    SAHOTA: Hello, is this mic on?
25
```

```
109
             I'm back here. It's Rajinder back here.
 1
             EXECUTIVE OFFICER COREY: This was a long-winded
 2
 3
    way of --
             INDUSTRIAL STRATEGIES ASSISTANT DIVISION CHIEF
 4
    SAHOTA: I found a mice that works back here.
 5
 6
             EXECUTIVE OFFICER COREY: -- punting to Emily our
 7
    economist -- Rajinder.
 8
             INDUSTRIAL STRATEGIES ASSISTANT DIVISION CHIEF
 9
    SAHOTA: We're here. So based at the January 20 -- 27th
    Board hearing, there was a request that we do more --
10
    provide more information on the cap-and-tax scenario. And
1 1
    we went back and we took what was already in the scoping
12
    plan, the proposed plan, and we fleshed out the details.
13
    And we did a preliminary analysis of the economics, the
14
15
   macroeconomics of that analysis, which we presented at the
16
    workshop on February 9th.
             What we really did in that scenario is we looked
17
18
    across all sectors of the economy. So this is energy
    transportation industry, recycling and waste, agriculture,
19
20
    and high global warming gases. And we said if we want to
21
    get from to 2020 -- the estimated values in 2020 and get
    to 2030, what does that look like? So let's make everyone
22
    fair partners in this effort.
23
             What we did was we realized that that indicates a
24
25
    4.5 year-over-year decrease in each of these sectors.
```

```
110
    What you'd have to do is take that 4.5 percent
 2
    year-over-year decline and translate that into individual
    facilities, individual entities, fuel suppliers, natural
 3
    gas suppliers, and the State.
 4
 5
             So there's additional work that would have to be
 6
    done to actually design that measure and actually
 7
    implement it, but we fleshed it out in a way that allows
8
    us to do the economic analysis to the same level of detail
 9
    that we've done for the proposed plan, and for carbon tax,
    and all direct regulations.
10
             One of the challenges with the 4.5 year
1 1
    percent -- 4.5 percent year-over-year decline is, there's
12
    some sectors that really can't do that year over year. So
13
    if through the process of actually having to try and
14
15
    design this, we realizes that some of those sectors can't
16
    do this, you're going to be asking other sectors to do
17
    more.
18
             And when you're looking at 4.5 percent, year
    after year, and there's no flexibility in being able to
19
20
    carry-over some extra credit from year 1 to year 2,
21
    because you're really asking them to do it continuously,
    so you have the continuous potential co-benefits, where
22
    you end up is a lot of businesses not investing in and
23
    keeping that industry or those jobs in California.
24
25
             And as we think about modeling that, what we're
```

```
111
    seeing is you're looking at a 25 percent reduction in fuel
 2
    use at some of the industry in the State. On top of that,
    you're looking at 10 to 15 percent electrification, and
 3
    you're still not getting the 4.5 percent year over year
 4
 5
    reductions.
 6
             So we did flesh this out. We have done the
 7
    preliminary analysis. We will go over it tomorrow,
 8
    because I know Board Member Takvorian is really interested
 9
    in this one. But we are seeing some challenges here, and
    I think it's important that we remember that there's
10
    multiple objectives that we're trying to balance here, but
1 1
    we are seeing some challenges really in -- and is it even
12
    doable to ask everyone to go -- to go and reduce 4.5
13
    percent year over year?
14
15
             MODERATOR LUCERO: So I'm not going to let you
16
    guys put your cards up for this one, but we can come back
    to it if we need to. We're going to do a public comment.
17
18
    I've got 3 public comments. You are limited to 1 to 2
    minutes with the caveat that after your public comment
19
    we're going to a break.
20
21
             Sean Penrith. Is Sean Penrith here? Raise your
22
    hand.
23
             Okay. Mic is coming to you. Sean, you've got 1
24
    to 2 minutes.
25
             MR. PENRITH: Thank you. Sean Penrith with the
```

```
112
    Climate Trust in Portland, Oregon. So two really
 2
    important comments I heard. One was from Martha Argüello
    and the other one was Luis Olmedo.
 3
             You made the point about there's not enough money
 4
 5
    to go around for environmental protection, which is a good
 6
    one. And Martha said health comes first. And there's
 7
    really 2 lungs that we're talking about here, one being
8
    the human lung and the other being the natural lung.
 9
             So the Climate Trust in Oregon is 20 years old.
    We've run one of the oldest offset programs in the
10
    country. Because of our investment into offsets, we've
1 1
    been able to stimulate rural economies, many of the
12
    projects that we invest in are in disadvantaged
13
    communities. We're losing 26 million acres of forest
14
15
    between now and 2030.
16
             If we don't have the offset mechanism, we cannot
    attract the finance that we need. Many jurisdictions are
17
18
    short on their public balance sheets. We at the Climate
    Trust have an impact fund where we are attracting outside
19
20
    institutional capital. If we didn't have the offset
21
    mechanism, none of that capital would be available.
22
             Thank you.
             MODERATOR LUCERO: Thank you.
23
             Shelly Sullivan, raise your hand. Over here on
24
25
    the this side of the room.
```

```
113
             MS. SULLIVAN: Is this on?
 1
 2
             Hi. Shelly Sullivan with the Climate Change
    Policy Coalition. And I think this is a really important
 3
    discussion that we're having today. But my question
 4
 5
    actually goes back to a process and timing question. I
 6
    think that -- and maybe this is going to be addressed in
 7
    the next agenda item of discussion of how addressing the
 8
    EJAC recommendations, and maybe -- so maybe I'm putting
 9
    the cart before the horse.
             But -- so I think stakeholders want to know when
10
    we are commenting on the January 20th, 2017 draft, are we
1 1
    only commenting on that draft? And then what happens if
12
    some of these Environmental Justice Advisory Committee
13
    recommendations get put into this scoping plan? Is there
14
15
    going to be another version and another time for us to
16
    take a look at that new plan and make comments on that?
    And does that push back the further Board approval of the
17
18
    scoping plan?
19
             Thanks.
             MODERATOR LUCERO: Under 2 minutes, excellent.
20
21
             So let's have that as a question we'll do after
    public comments in terms of process. We'll get to that
22
23
    one.
             Kevin Jefferson.
24
25
             Where is Kevin?
```

```
114
 1
             Tim Tutt.
 2
             Over here on this side of the room.
             MR. TUTT: Good. Hello. Good afternoon. Is
 3
    this on?
 4
 5
             Yes. Okay. I just wanted to say I think we all,
 6
    in this room, support the goals of the environmental
 7
    justice community. We want more health, better health for
8
    the disadvantaged communities. We want the benefits to be
 9
    spread through all of our State, not just to areas where,
    you know, are not disadvantaged.
10
             What I would say is that I think that the
1 1
    opposition to the Cap-and-Trade Program is misplaced. And
12
13
    what I would give as an example, I spoke at a Board
    meeting where I said this period what we just went through
14
15
    is too unusual, and too short to make long-term
16
    conclusions about the success of the Cap-and-Trade Program
17
    on any of those aspects.
18
             And I wanted to go back to in the January Board
    meeting, there was a presentation about the ARB's 2017
19
20
    goals. And in that presentation, there was a chart that
21
    showed diesel PM -- diesel PM reductions from 1990 to
22
    2015.
23
             And in that chart, there were 3 separate periods
    for 2 or 3 years where those diesel emissions trended up.
24
    Whereas overall, there was an 85 percent reduction over
25
```

```
115
    time. So imagine what would have happened if somebody
 2
    came in at the end of one of those 3-year periods and said
    this program isn't working. We need to throw it out and
 3
    start over again. We wouldn't be getting to that 85
 4
 5
    percent reduction, I can guarantee you.
 6
             So that's my comment.
 7
             MODERATOR LUCERO: All right. Thank you.
8
    you for our public, and also thank you for sticking to the
 9
    time. I know that can be a little daunting and stressful.
             So we are at 4:10 on that clock -- okay, 4:12 on
10
    that clock. We're going to come back at 4:28, just a
11
    little before 4:30. If you dawdle longer, we have less
12
    time to talk.
13
             So we'll see you back here. Thank you, all.
14
15
   There is refreshments in the back. Bathrooms are that
16
    way.
17
             (Off record: 4:13 p.m.)
18
             (Thereupon a recess was taken.)
             (On record: 4:28 p.m.)
19
20
             MODERATOR LUCERO: All right. Let's come back to
21
    the able and reconvene.
22
             The time we take to get to the table is time that
23
    we don't have to discuss.
             Please make your way back to the table.
24
25
             All right take your seats, and start back up.
```

```
116
             We are officially 22 minutes behind schedule, so
 2
    let's start -- I know there's a couple people filtering
    back in. And hopefully, it's not the people we need to
 3
    present the next section.
 4
 5
             (Laughter.)
 6
             MODERATOR LUCERO: We are on transportation.
 7
             All right. Kevin, go ahead.
 8
             EJAC MEMBER HAMILTON: All right. Thank you very
 9
   much. I'm trying to strip this down a little, but -- so
    with transportation, we had sort of these overarching
10
    principles. I just wanted to briefly mention where we
11
    really see a California where all communities can breathe
12
    clean air and have access to safe, affordable, clean
13
    transportation options.
14
15
             And we want to make sure that that transportation
16
    planning and the activities are inextricably linked to
17
    public health. So, you know, that's enough said about
18
    that.
19
             We've talked about access. That includes, of
    course, to transportation technologies and clean
20
21
    transportation technologies, and making sure we have
    meaningful investments in these disadvantaged communities.
22
23
    By the way, I want to see meaningful investments in every
    community in California, just to be clear.
24
25
             (Laughter.)
```

```
117
             EJAC MEMBER HAMILTON: But we do say that the
    people who have suffered the most should probably come
 2
    first. But yet, we do want to see it for everyone. I'm
 3
    not somehow suggesting that I don't want to see health
 4
 5
    across California, and no one in this room is.
 6
             So let's never forget that, that because we are
 7
    advocates for environmental justice communities doesn't
8
    mean that we don't think of our whole state as the place
 9
    we live and our neighbors who we want to see realize these
    same benefits. So let's just be clear about that.
10
             But again, these communities have suffered the
1 1
    most for the longest. And while I sympathize and
12
    empathize with my friend Eleanor, I will say this, that
13
    while I do honor everything that's happened there and I
14
15
    don't suggest that we don't in any way, shape, or form.
16
    However, not all of our communities in California have
    felt that same -- that same relief or experienced those
17
18
    same benefits.
             So we want to see how that can be expanded, so
19
    that we all get it. And that may be one option, cap and
20
21
    trade. It may be cap and tax. It may be whatever, but we
    honor it all, right? And that's what we're about. So I
22
    don't think anybody is suggesting that.
23
             We really want to see better coordination.
24
25
    Transportation is the one place, besides energy, where
```

```
118
    this coordination between the agencies really has to
 2
    happen. And it thrilled me to see a cooperative between
    CEC, CTC, and ARB. So I was really thrilled to see that.
 3
    And that needs to continue.
 4
 5
             And then we want to see these impacts happen and
 6
    be measured at the community level, and driven by robust
 7
    community presence -- participation. So additional --
8
    more specific points. We support -- and I'm part of CCFC,
 9
    full disclosure, and a huge believer -- central
    California -- or excuse me, central California.
10
    California Clean Freight Coalition.
1 1
             And we want to see not only the Sustainable
12
    Freight Program happen in port communities and communities
13
    adjacent to port. But keep in mind, here's the San
14
15
    Joaquin Valley. We are the central freight corridor for
16
    the region and for the western United States.
17
             It pretty much passes through us, if it's not
18
    coming to us. And so these last mile and drayage truck
    projects, and electrification of trucks stops and all this
19
20
    stuff. We really want to see these pilots happen in our
21
    region as well.
22
             And I'm just going to give a shout out for
    Northern California, because I know those folks feel
23
    pretty abandoned at times as well, so again, all of
24
25
    California. It would be great to see a project in
```

```
119
    Susanville, right? I'm sure they would appreciate that,
 2
    and Eureka and Crescent City. So we need to really keep
    thinking about all these communities in all of California.
 3
             And then we support and strongly suggest you
 4
 5
    increase the Local Carbon Fuel Standard. And we want to
 6
    strengthen, especially through transportation, through ARB
 7
    the SB 375 targets, and the accountability that goes with
 8
    that. We don't feel that some of these communities, and I
    can speak for counties in my own valley, who have
 9
    unfortunately chosen not to set aggressive targets.
10
    there's no way to hold them accountable for that at this
1 1
    point. So we need to build that into this process, so
12
    there is some accountability there, so an extra freeway
13
    lane doesn't count as your greenhouse gas contribution to
14
15
    your SCS target that you've set.
16
             So we need to clean that up. We support SB 350
    and its study findings. We think that needs to keep
17
    growing, and we need to see these barriers to accessing
18
    this clean technology and mobility options overcome. And
19
    we need to see the unique barriers in rural and other
20
21
    small communities out in the desert, up in the mountains
    addressed and managed.
22
23
             And I'm going to leave it there, because, you
    know, we've got a larger list, but I think that's enough
24
25
    said for right now.
```

```
120
             MODERATOR LUCERO: Okay. I noticed that Kevin
    started looking away from where he could see the red sign.
 2
             (Laughter.)
 3
             EJAC MEMBER HAMILTON: You're right. I was
 4
 5
    getting a complex there. You're right.
 6
             (Laughter.)
 7
             MODERATOR LUCERO: I will sand in front of you,
 8
    if I have to, guys. I want to make sure you get to all
 9
    your points.
             Katie.
10
             EJAC MEMBER VALENZUELA GARCIA: A couple of
11
    additional points on Kevin's points. Thank you, Kevin.
12
13
             First with the Low Carbon Fuels Standard, and I
14
    know we'll talk about this more with natural and working
15
    lands, making sure that an increase the Low Carbon Fuel
    Standard is not from vie a biofuels. We'd like to see
16
    that from renewable electric sources. And that's a point,
17
18
    again, that Tom will cover more.
             And then the second point, just because I'm
19
    personal pretty passionate about it, and I mentioned it at
20
21
    the Board hearing, but I just want to make sure it doesn't
    get lost. Within local action, there's this program that
22
    would create a system run by CAPCOA that would allow for
23
                                                                FebEJAC-6
    developers to purchase GHG offset credits for when their
24
25
    projects will increase VMT beyond the level that's
```

```
121
   mitigatable.
 2
             And I think that's one very clear example of
                                                                FebEJAC-6
    something within the scoping plan right now that is
 3
                                                                cont'd
    directly contrary to the intent of what we're trying to do
 4
 5
    with land use and SB 375 and our other targets. And I'd
 6
    like to see that expressly taken out. And it's a
 7
    recommendation we made back in December, but just pointing
 8
    that out.
             EJAC MEMBER FONG: We're kind of cleaning up
 9
    Kevin's comments. Okay. We're adding to it.
10
11
             EJAC MEMBER HAMILTON: The red sign. The red
12
    sign.
             (Laughter.)
13
             EJAC MEMBER FONG: I know. So he ran out of
14
15
    time. We're extending out time. So just to add a little
16
    bit more specific detail to the comment about paying more
17
    attention to investments in rural communities, we
18
    specifically were -- we thought it was important to really
    look at the infrastructure necessary for the
19
    electrification of vehicles that go through the rural
20
21
    communities, whether that is for freight transportation or
    for personal or public transportation.
22
23
             MODERATOR LUCERO: All for gaining time, but I
    also want to make sure we have an opportunity to talk.
24
    Since I don't see cards, I will point out that when the
25
```

```
122
    EJAC did review the discussion draft of the scoping plan,
 2
    the transportation section was the section where they
    found there was the most incorporation of their items.
 3
    However, there's still more, as you heard a couple of the
 4
 5
    comments here.
 6
             So any thoughts in terms of those EJAC
 7
    recommendations that didn't make it into the discussion or
8
    scoping -- the scoping plan -- proposed scoping plan? You
 9
    know, maybe they're fitting into some of these parking lot
    items we have for later discussion.
10
             Any thoughts?
1 1
             Maybe the EJAC can mention some of the item they
12
    didn't see?
13
14
             Kemby[sic].
15
             EJAC MEMBER SHAKUR: You called me Kemby. That's
16
    cute.
17
             (Laughter.)
18
             EJAC MEMBER SHAKUR: I just want to emphasize the
    green infrastructure as part of these transportation
19
20
    projects. Because in the City of Oakland, it's like as
21
    soon -- I think it has a lot to do with our bureaucracy,
    but as soon as transportation hits Oakland, say like BART,
22
    there's not a whole lot of green infrastructure. And then
23
   once it leaves Oakland, still -- I mean, once it leaves
24
    Oakland, it is.
25
```

```
123
             So San Leandro, beautiful. Richmond, El Cerrito,
 2
    beautiful. But Oakland, absolutely terrible. So that's
 3
    really important.
             Thank you.
 4
 5
             MODERATOR LUCERO: Any other thoughts? Do we
 6
    want to go on to another sector?
 7
             Great. John.
 8
             BOARD MEMBER BALMES: Just really quickly to
 9
    respond to, I think, Katie's good point. I would agree
    that, you know, there may be some really compelling reason
10
    why we would allow offsets when VMT targets can't be met,
1 1
    but I certainly don't like that. I'd like to hear the
12
13
    compelling reason.
             MODERATOR LUCERO: Sandra.
14
15
             VICE CHAIR BERG: So help me think about some of
16
    the actual action items that are listed in the scoping
    plan that have specific amounts? So when you're looking
17
18
    at that you would like to see a 40 percent reduction, for
    example, in target truck fleets and things like that, when
19
    we look at where we are today, and that we estimate that
20
21
    it's about 30 percent of the existing trucks aren't even
    in compliance with the existing Truck and Bus Rule, and
22
    that that -- those -- most of those are single operators.
23
    And those single operators most likely are coming from
24
25
    middle income to EJ areas.
```

1 1

And yet, if we were to take a look at an additional 40 percent, one of the things I'm very worried about is as we target different industries that it's going to push it into just big industry, and it's going to take away the opportunity to for entrepreneurialship and smaller companies.

So when you have a specific amount in here like this, how are you thinking about that amount, and in a 10-year period success and stuff and like that?

EJAC MEMBER HAMILTON: Sure. So I have a long history with this having been around for the original crafting, as were you, of the different size of trucking companies where we would -- where we defined a small trucking company as being 3 or more trucks.

So we were very engaged in that. I think ARB took a big hit over the original Truck and Bus Rule, mainly because of the PM filters. And, you know, that's -- you know, sometimes things don't work out. You just shake it off and move forward. You know, you get punched in the jaw, you need to step up and throw one, right? So you need to quit taking those hits and ignoring them, and just brushing it off or feeling bad about it.

What you did was with the best of intention with the technology that you had available at the time to deal with a problem that is a health threat to everybody around

```
125
        So, you know, to -- so I congratulate you on it.
 2
    by the way, when tech -- when new tech is rolled out,
    sometimes stuff doesn't work. We know that. And that's
 3
    why you pilot it out there, and then you find out what
 4
 5
    doesn't work and you go for what does.
 6
             So with the idea of reducing the emissions
 7
    related to the truck fleet, there's a lot of great
8
    advances happening overall in both the diesel industry,
 9
    and certainly with -- some of us in the valley, for
    instance, feel that in the natural gas conversion industry
10
    you're going to need to use a bridge fuel here.
1 1
             We're not going to electrify the 99 and the I-5
12
    from L.A. to Sacramento. I wish we could. I'd love to
13
    see a catenary system there or a rail -- a third rail
14
15
    system. Yeah, I don't think you've got the money for
16
    that. I don't know that anybody does, even over a 10- or
17
    20-year period.
18
             So we're really thinking of that longer horizon
    time, the ability to reduce the engines that are out there
19
20
    and help those folks make those investments. So we need
21
    to step up with our incentive funding, and we need to make
    sure that whatever regulation we put in place has a decent
22
    amount of incentive funding on the front-end of it, but
23
    yet that needs to cycle down over time. I'll use a
24
25
    trucking term. And, you know, at a certain point in time,
```

```
126
    you've got top drop a gear, and that's just the way it
    goes, and that's the way it is here. That's evolving even
 2
    as we sit. You know, your big truck players are at the
 3
    table with you. You've got Cummins at the table and Ford
 4
 5
    at the table.
 6
             So, you know, you've got all the people in the
7
    room you need. You have the technology coming on board.
8
    So we just need to help -- the guy that bought a new truck
 9
    in 2012, we've got to help him figure out so what do I do,
    when do I change that out, and when does it make a good
10
    business case for me to do that?
1 1
             Well, it has to happen sometime in the next 10 to
12
    20 years, okay? So if that happens in 2025, well, that's
13
    the way that happens. So we recognize those realities,
14
15
    and we're not trying to destroy an entire industry and
16
    drag all these people down, so...
17
            MODERATOR LUCERO: Any other questions or
18
    comments?
             I quess -- oh, there you go. Gisele.
19
20
             EJAC MEMBER FONG: I just wanted to take the
21
    opportunity, because I don't know if the Board had read
    through the comments from our community workshops that we
22
    had over the summer. And one of the things that we heard
23
    so much in L.A. and Wilmington were folks, you know,
24
25
    really supportive or actually relied on public
```

```
127
    transportation. And we know obviously that we want to get
 2
    folks into public transportation.
             But in terms of day-to-day barriers, there was
 3
    such -- because, for example, Wilmington is such a freight
 4
 5
    heavy community that the basic issues of safety, right?
 6
    So a young woman was talking about how her mom could not
 7
    drive her to school, and so asked her to ride her bike,
8
    you know, but just that basic safety hazard, I think, in
 9
    communities that are so impacted by freight and goods
    movement. That was one issue.
10
             Another issue was really that issue of kind of
1 1
    gaps in where the service is. So, you know, really
12
    supportive of folks wanting to take the train, but then
13
    that last -- last mile -- and I know that you're aware of
14
15
    this, but I just wanted to give that input. And I would
16
    imagine that is very true in other communities that we've
    heard from, that there definitely are gaps that folks feel
17
18
    day to day in terms of getting into public transportation.
             And again, I don't know where that sits for the
19
    Board, in terms of what is your authority to manage or to,
20
21
    you know, direct solutions for. But I wanted to put that
    out there as we have this opportunity to tell you what we
22
23
    heard from residents across the state.
             MODERATOR LUCERO: Judy.
24
25
             BOARD MEMBER MITCHELL: So I would just like to
```

```
128
    ask you to help me understand what your position is on the
 2
    dairy digesters and conversion to -- of waste to fuels?
    And so I'm not quite sure where you are on that.
 3
             MODERATOR LUCERO: Tom.
 4
             EJAC MEMBER HAMILTON: You've been really quite
 5
 6
   here all day.
 7
             EJAC MEMBER FRANTZ: I would have spoke to this
8
    in the next section too under natural and working lands.
    But the -- you know, the dairies are the biggest Polluters
                                                                FebEJAC-7
    we have in terms of criteria air pollutants in the San
10
    Joaquin Valley in terms of VOCs and the ammonia. Just
11
    huge sources.
12
             And by putting money into dairy digesters,
13
    they're like a couple billion for each dairy. Sort of the
14
15
    money proposed to go into this. It's a huge subsidy to
16
    support a really unsustainable industry. You know,
    they're importing over half their feed from the midwest,
17
18
    probably three-fourths of it, and alfalfa from Arizona
    using Colorado River water.
19
             And it's a very unsustainable industry. And this
20
21
    is a Band-Aid approach. There's other ways the dairy
    industry can avoid most of those methane emissions by
22
    using pasture. Feeding the cows so their mature goes back FebEJAC-8
23
    to the ground immediately is one way. The problem is this
24
25
    huge lagoon. And it's a waste disposal system, because
```

```
129
    there's so many cows on so little land.
             They need to change the whole paradigm of how
 2
    they operate to become sustainable for the future. Just
 3
    like we all have to change how we live our lies in order
 4
 5
    to reach like these 2050 goals. The dairy industry. We
 6
    have over 1,100 dairies in the San Joaquin Valley
 7
    averaging -- they milk, average, 1,400 cows a day at each
8
    one of these dairies.
 9
             Each one of these dairies average - the bigger
    ones are worse - 50,000 -- the equivalent of 50,000 tons
10
    of CO2 a year. They should -- they would easily qualify
11
    for the mandatory reporting of 25,000 tons a year.
12
13
             I think they should be regulated like an
    industry -- like the industry they are, and not have this
14
15
    agricultural exemption. For years, California exempted
16
    agriculture from the Clean Air Act illegally. Now, you're
    exempting agriculture from the Greenhouse Gas Act, AB 32,
17
18
    basically, and trying to pay them to do -- to reduce their
    emissions.
19
20
             And so, again, dairy digesters, it's not
21
    sustainable. There's never -- dairies hate it, because
    their lagoons are for the disposal a ammonia. And the
22
    methane is incidental to getting rid of that ammonia into
23
24
    the air.
25
             With the digester, no one can say what happens to
```

```
130
    that ammonia. They have an issue. And who maintains
 2
    these digesters? You can spend a couple million dollars
    on one of these, and then in 5 years something goes wrong,
 3
    they don't want to -- it's just a waste of their time to
 4
 5
    even bother with these things. That's why no one has gone
 6
    for it yet. And now, you're solving a problem of them not
 7
    wanting to do it by trying to throw even more money at
8
    them, but it's not going to work.
 9
             That's how we feel.
             BOARD MEMBER MITCHELL: Very complete answer.
10
11
    Thank you.
             MODERATOR LUCERO: We knew who to talk to for
12
    that response.
13
14
             Okay. Do we want to move on to natural and
15
    working lands?
16
             All right. So Tom.
             EJAC MEMBER FRANTZ: Kemba.
17
18
             MODERATOR LUCERO: All right. Kemba.
             EJAC MEMBER SHAKUR: Before I go on, Tom has a
19
20
    really interested -- interesting philosophy about cheese
21
    and pizza.
22
             (Laughter.)
             EJAC MEMBER SHAKUR: And, I mean -- but, I mean,
23
    it's really real. I don't eat dairy products any more. I
24
    don't eat meat, and Tom has a lot to do with that. But,
25
```

```
131
    Tom, can you break down that pizza thing that you talked
 2
    about?
             EJAC MEMBER FRANTZ: Twenty-five percent of the
 3
    dairy milk produced in California is made into mozzarella
 4
 5
    cheese. Most of the mozzarella goes to, you know, pasta
 6
    dishes, but really the bulk of it's going to pizza.
 7
             Now, Californians only eat about half of all the
8
    dairy produced in California. The rest is exported. But
 9
    if we cut back our consumption of pizza significantly, we
    would be cutting back thousands of tons of greenhouse
10
    gases at the same time, because if we don't buy their
1 1
    product, they can't produce it.
12
             That's -- and so we recommended that there be a
13
    campaign coming out of CARB, which is really a health
14
15
    campaign over obesity and diabetes from eating too much
16
    dairy that this is one method of reducing greenhouse
    gases, make a strong statement that if we consume less
17
18
    dairy, we will get part way there.
             MODERATOR LUCERO: And yes, that is one of the
19
    recommendations in the appendix.
20
21
             EJAC MEMBER SHAKUR: Thank you, Tom. I learned a
    lot from him. But I'm -- we're -- this is the urban
22
23
    forestry greening section.
24
             Let me just get this closer.
25
             Every rooftop, every sidewalk, every open space
```

```
132
    is an opportunity for green space. Improved air quality,
 2
    green jobs, training, and environmental education are also
    benefits of urban greening. Greening project require
 3
    long-term maintenance. And GHG funding only provides
 4
 5
    funding for establishment and not long-term maintenance.
 6
             We're hopeful that people will look at the issue
 7
    of maintenance, because a lot of the funders only focus on
 8
    planting trees and not maintenance. And I think that's
    the reason why a lot of -- a lot of trees fail, and the
    reason why we've lost thousands of trees.
10
             Yeah, that's it. That's all I had to add.
11
             EJAC MEMBER FRANTZ: And since we talked about
12
    biogas already, I'll skip that part, and go to biomass a
13
    little bit.
14
15
             We have a phenomena in the San Joaquin Valley
16
    called biomass incinerators for energy. They're power
17
    plants, but they're small in terms of the energy they
                                                                FebEJAC-9
18
    produce, but they're huge in terms of the pollution they
    produce. A 25 megawatt biomass plant pollutes our air in
19
    terms of particulates about 30 to up to 50 times more than
20
21
    a 750 megawatt biomass plant.
             Or let's put it, for the same amount of energy,
22
23
    for the same amount electricity produced, the particulates
    out of a biomass incinerator are up to 50 times greater
24
25
    than out of a natural gas power plant. That's how bad
```

```
133
    they pollute the air, and how little electricity they're
    making. It's a very inefficient way. Yet, it's called by
 2
    CARB -- CARB recognizes some assumption that this is clean
 3
    renewable energy, when you burn biomass.
 4
 5
             Now, over a million tons of biomass is trucked
                                                               FebEJAC-10
 6
    into the San Joaquin Valley every year from landfills in
 7
    the major metropolitan areas to be incinerated. And up to
 8
    a million tons of like almond waste wood is incinerated
    annually as almond trees are removed. For 7 years, we've
    been working on returning this almond waste to the soil,
10
11
    where it builds carbon in the soil. It actually
    sequesters carbon that's been removed from the air,
12
    instead of -- and it adds so many nutrients. It's just an
13
    inconvenience and a bit of an expense.
14
15
             I'm an almond farmer. I know what it would cost.
16
    I know what it costs to take my trees out and have them
17
    sent to the biomass incinerator, and that costing a lot of
18
    money these days, and it should continue to cost even more
    money. We should pay the true cost to that.
19
             And then the alternative of returning this to the
20
21
    soil, where it benefits our future crops greatly will then
    look more economic. But here's what happened this last
22
    year. We have some trees dying -- millions of trees dying
23
    in the Sierras. Most of them are inaccessible. They're
24
25
    going to stay there.
```

134 But somebody got the bright idea that we need to bring those trees out of there, I guess away from homes 2 and roads, but need to bring them down to the valley floor 3 and incinerate them for clean renewable energy. So the 4 5 PUC agreed with this, and it fits with this scoping plan 6 that this type of energy is clean and renewable. 7 The words are all through here that this is a 8 good way to produce energy. Yet, there's a little community in south Fresno, called Malaga, 200 homes, sits 9 next to this biomass facility that now got a new lease for 10 5 years. They have to take 9,000 trucks loads a year of 11 trees from the Sierras and burn them on the valley floor 12 in South Fresno next to 200 people in an environmental 13 14 justice community, who also sit right next to one of the 15 biggest glass factories in California. FebEJAC-11 16 And, you know, everybody -- everybody is 17 complicit in this -- in the State government of allowing 18 this to happen, telling these poor people here that they've got to suck up that pollution, so that dead trees 19 in the forest can somehow be removed. It doesn't make any 20 21 sense. Those dead trees are carbon that should remain in the forest soil. It's one of our number one places for 22 23 sequestering carbon. And those dead trees don't have to removed. 24 You 25 really don't have to do anything with them. They're going

```
135
    to slowly put that carbon back into the soil and new
 2
    growth will suck it up. And you have that cycle.
             When you remove carbon from the soil like that,
 3
    you're upsetting the carbon cycle in the forest, and it
 4
 5
    takes years and years for that to come back. So we've
 6
    been making these recommendations, but we don't seem to
 7
    have anybody listening to them.
 8
             Thank you.
 9
             MODERATOR LUCERO: Thank you, Tom.
             Do you -- we have anything to add from the EJAC
10
    or any clarifying questions from the ARB?
1 1
             Barbara.
12
             BOARD MEMBER RIORDAN: I have a couple questions
13
    I'd like to ask the Committee, but not for a response
14
15
    maybe today, but maybe tomorrow. We were talking about,
16
    in this parking lot area, about how do we respond to
    needing to move certain things or identify certain things
17
18
    that aren't in our purview, but who we are working with.
    And I just would like you to kind of look at page 112 and
19
    113. If you look at that, from my opinion, you -- we have
20
21
    identified -- the staff has identified pretty clearly, I
    believe, the responsibility, for instance, of the Food and
22
    Agricultural Department, for the Healthy Soils Initiative,
23
    there are things that are clearly identified.
24
25
             What I would like to know, is that adequate?
```

```
136
    you feel -- or should we identify it in some appendix or
 2
    something else? And I just happen to look at that and
    think that's a good example of identifying certain
 3
    programs that are part of the State structure that have to
 4
 5
    do with this ongoing scoping plan, and what's somebody
 6
    else's responsibility.
 7
             So I'll look forward to maybe a response tomorrow
8
    at the hearing.
 9
             MODERATOR LUCERO: Or if we have one today as
    well.
10
             John.
1 1
             BOARD MEMBER RIORDAN: It's hard to read quickly
12
    a couple of pages, but I just --
13
             BOARD MEMBER BALMES: Well, thank you, Tom, for
14
15
    talking about biomass. You know, that's one of my
16
    research interests is mostly in the developing world, low
    and middle income countries where biomass is used for
17
18
    cooking and heating, lighting. And so it's not
    particularly healthy stuff to breathe.
19
20
             So my question to you, since you have a lot of
21
    knowledge, more than me, about these biomass power
    generator facilities in the valley, what's the level of
22
    emissions controls that they're required, or that they
23
    have, or -- because you know, I would agree, just burning
24
25
    biomass is, you know, a terrible way to pollute.
```

```
137
 1
             I mean, people use the argument that part of the
 2
    reason we have to get rid of the dead trees is to prevent
    catastrophic wildfires, which also pollute heavily. I'm
 3
    not saying that that's necessarily what I believe, but --
 4
 5
    so I agree this is an important issue to bring up. And,
 6
    you know, we heard this several years ago with the first
 7
    scoping plan. And, you know, I do have problems with
8
    considering, you know, burning biomass fuel to be a clean
    fuel. It's potentially sustainable in that there's always
 9
    going to be dead trees and vegetation to burn, but it
10
    doesn't mean that it's necessarily clean.
1 1
             So I just wanted a little more clarification, if
12
    you would.
13
             EJAC MEMBER FRANTZ: Well, the figure I
14
15
    mentioned, like fine particulates are at a rate of 30 to
16
    50 times greater than a natural gas plant, the controls on
    those particulate matter, per megawatt hour produced.
17
18
             BOARD MEMBER BALMES: Those are the actual
    emissions --
19
20
             EJAC MEMBER FRANTZ: Per unit of electricity
21
    produced.
             BOARD MEMBER BALMES: Yeah, without any kind of
22
23
    controls?
            EJAC MEMBER FRANTZ: Well, they have controls.
24
25
    They have some particulate --
```

```
138
             BOARD MEMBER BALMES: This is with the controls.
 1
 2
    Okay.
             EJAC MEMBER FRANTZ: That's with the controls
 3
    that -- it's a huge loophole for these things. They can't
 4
 5
    burn cleanly. They burn worse than coal cleansed.
 6
             BOARD MEMBER BALMES: I know that to be a fact.
 7
             EJAC MEMBER FRANTZ: Yea. So it's like a
8
    loophole. Okay, because the excuse is open burning is
 9
    even worst. See that's always the excuse. So if the
    farmer burns their orchard prunings in the field that's
10
    really sooty and stuff. So at least at the biomass
1 1
    incinerator it's cleaner, but neither has to happen.
12
13
             The way forward is that is good, clean material
    that should be in the soil as nutrients, even water, and
14
15
    avoided meth -- avoided emissions. You know, the
16
    Co-benefits of returning that to the soil are huge.
    just -- but it's economics. That's all that -- why we're
17
18
    still doing it, this caveman idea.
             MODERATOR LUCERO: Any other questions or
19
    additional comments?
20
21
             Katie.
22
             EJAC MEMBER VALENZUELA GARCIA: I also want to
23
    add into the conversation to Barbara's point about the
    Healthy Soils Initiative that -- I mean, I do see some of
24
25
    the other recommendations around biomass burning as
```

```
139
    contradictory to that goal. You know, if we're pulling
 2
    biomass out from forests, if we're doing all of this for
    biomass facilities, for repurposing refineries to produce
 3
    biofuels, that's not contributing to the healthy soils. I
 4
 5
    think that's a competition.
 6
             So I'd like -- I think that's why we're coming so
 7
    strongly about trying to take that out of the scoping
 8
    plan, so that we focus more on the healthy soils work and
 9
    less on using that as a, you know, guote unquote clean and
    sustainable source of fuel.
10
             And I also just want to pull out our last
1 1
    recommendation in this section that's new around the
12
13
    cultural and prescribed burning for tribes, is something
    that we've heard a lot about for better forest management
14
15
    and control. I know it's going to be addressed somewhat
16
    in the forest management plan. And I've talked to Dave a
    little bit about that, but -- and we're finally having a
17
    call, you know, 3 months later next week with some of the
18
    tribal folks. So I'm hopeful that we're moving closer on
19
    that.
20
21
             But I do just think that -- I mean, it's
    important for us to recognize indigenous knowledge and
22
    contributions in this field of forest management. And
23
    that's not necessarily reflected in the natural and
24
25
    working lands section as it's currently written. And to
```

```
140
    echo comments that were made yesterday, that, you know,
 2
    again we haven't yet finished the quantification of the
    benefits in the scoping plan.
 3
             So really, natural and working lands is not
 4
 5
    accounting for any of our proposed emissions reductions to
 6
    meet the 2030 targets right now. And we think that's a
 7
    huge missed opportunity. And the degree to which we can
 8
    start trying to use existing knowledge and methods that
 9
    are already out there to start trying to quantify that
    within this scoping plan, I think would be preferable,
10
    because we'd like to see more investment go to this stuff.
1 1
    We'd like to see it be more of a part of our climate
12
    strategy, and part of the green industry and jobs that
13
    we're trying to build.
14
15
             MODERATOR LUCERO: Kevin.
16
             EJAC MEMBER HAMILTON: So thank you for your
    comment. And I did a quick read on the pages there. And
17
    your'e right, they point to the interagency cooperation
18
    and this area in where different agencies have different
19
20
    programs like CDFA. What I would say about that is
21
    unfortunately there's no teeth behind those programs that
    require that individual farmer to participate in that
22
23
    program. You can't make somebody do that.
             So -- and that we've constructed it that way, so
24
25
    that everybody is pretty much independent with regards to
```

```
141
   how they choose to take advantage of these wonderful
 2
    assets that are made available to them. And they do that
    for various reasons.
 3
             But I really want to get back to the biomass and
 4
 5
    the plants on the floor of the valley. We're not just
 6
    horrified by the emissions coming out of the electricity
 7
    generation process, how many truck trips do you think it
 8
    takes to actually bring these trees down the hill, and
                                                                FebEJAC-12
    what kind of trucks do you think they're using to haul.
    You think those are brand new diesel trucks that are
10
11
    hauling?
             I don't know if you've ever been behind a lumber
12
    truck, but I have been many times. And I've been almost
13
    sick a few times from the stack, you know, being stuck
14
15
    behind it, especially going down a big hill or coming up a
16
    big hill, which lots of those in the mountains.
17
             So I think, you know, we -- this is where it's
18
    global, right? The problem is much more than just the
    incinerator. It's how it's fed. So we -- some of us
19
    argue, have taken the position, that if those
20
21
    communities - and I'll illustrate it with North Fork,
    which is actually doing this - decide that the way they
22
    want to deal with this problem of safety - which is really
23
    a safety issue. Is that tree going to fall on my house?
24
25
    Is that tree going to fall on a road, okay?
```

142 I've reviewed a lot of literature now on 2 forestry, more than I ever wanted to as far as dead trees, and there is nothing I've been able to find that suggests 3 that these dead trees actually increase this wildfire 4 5 risk, okay? 6 Wild fires happen. Sometimes they're big 7 conflagrations, sometimes they're not. It turns out when 8 trees are dead more than a year or two and they lose all their leaves, they actually don't burn as well, which I 9 thought was fascinating. 10 So 2 years out on these dead trees, they don't 1 1 have any leaves. They're just stocks of wood sticking up, 12 nothing to really burn, hard to catch on fire. It's the 13 leaves and the tar in the trees that actually move the 14 15 fire along. So think about that. 16 But the safety issue is huge. So if that 17 community decides it wants a one megawatt generator 18 incinerator in their community, and they've made that decision as a community, and they're willing to deal with 19 20 some emissions that are going to happen with that, in 21 return they're going to get biochar, which they all -- the industry will tell you it's the greatest thing since 22 sliced bread, and they're going to put that back in the 23 soil versus just letting the tree sit there, cutting it, 24 25 and letting it lay on the ground and rot and go back to

```
143
    the soil, I wouldn't fight with them. It's their
 2
    community, so I'm not going to go there and tell them how
    they should do their business.
 3
             But I don't want it in mine, so don't transport
 4
 5
    your problem to me. And it's the same thing we say to
 6
    L.A., just today, Kern County, I was listening to the
7
    news. I listen to NPR, right?
8
             On the way up here, violation from green waste
 9
    being brought from Los Angeles illegally to Kern County
    and dumped. Wow. What a surprise.
10
             But the thing is it's not a surprise, is every
1 1
    day there's thousands of tons of that same waste coming
12
    legally to the San Joaquin Valley, and being dumped. So
13
    again, one of the things we've talked about in here, is
14
15
    the idea of communities taking care of their own trash,
16
    okay?
17
             If you live in Porter Ranch -- and I'm only
18
    calling that out, because I know about it, and I watched
    it actually being built. Most people don't know you know
19
20
    it was called Porter's Ranch.
21
             But anyway, that's a very wealthy community.
    they generate trash. I wonder if they have a landfill
22
    there in Porter Ranch? I don't know, but I bet not.
23
             So we're just saying in the valley at least,
24
    we'll take care of our trash, you take care of yours, and,
25
```

```
144
    you know, we'll all be a lot healthier for it.
 2
             MODERATOR LUCERO: Any other comments or
    questions on this or do we want to move to like where we
 3
    have agreement, what we need to move on next?
 4
 5
             We -- I do want to make sure -- and John, I'm
 6
    going to call you out. Can you introduce yourself, John?
 7
    And I think -- I know you had quite a harrowing experience
8
    getting here, so I think that's important to share for
 9
    folks.
             BOARD MEMBER EISENHUT: Well, I didn't -- there
10
    was -- there was -- I don't expect anyone to be coming --
1 1
    to be coming this direction on Highway 99, but there was a
12
    fatal -- there was a police involved shooting that
13
    diverted traffic. So I apologize.
14
15
             I knew I would be here. I knew I would be here
16
    late, and I will, to the extent anyone is interested in
    visiting with me, I will stay until that last person has
17
18
    had an opportunity to visit.
             MODERATOR LUCERO: Thank you, John.
19
             I just wanted to let you have an opportunity to
20
21
    introduce yourself. And I knew there was a good reason
    for you coming in when you did, so -- all right.
22
    there's no other comments or questions specifically on the
23
    EJAC's recommendations on the natural and working lands,
24
    let's move -- well, first, let's just do one last check.
25
```

```
145
   We didn't use up our full public comment period.
 2
    there's a couple folks who wanted to do public comment.
             As you guys look at our parking lot, and think
 3
    about where you saw agreement, we're also going to open up
 4
    for public comment. This is going to be the last
 5
 6
    opportunity for public comment.
 7
             So if you have one, go fill out one of those.
8
    And then my microphone runners.
 9
             I have Kevin Jefferson is first up.
             Kevin.
10
             Okay. Kevin is gone.
1 1
             Michael -- and I might mispronounce this --
12
    Boccadon[sic]?
13
            MR. BOCCADORO: Boccadoro.
14
15
            MODERATOR LUCERO: Boccadoro. Sorry.
16
             There you go.
17
             And you have 1 to 2 minutes. Go ahead. Do you
18
   have a mic?
19
             Okay. Go ahead.
20
             MR. BOCCADORO: Michael Boccadoro on behalf of
21
    Dairy Cares. I appreciate the opportunity. We've had
    this conversation Ms. Mitchell and other members of the
22
    Board. I'll let the we should rid the earth of pizza
23
    comment stand for itself, and let the millions of
24
25
    teenagers across America answer that question.
```

```
146
             But it's really important that we have a -- start
    to have a more comprehensive conversation about the dairy
 2
    industry and sustainable solutions to dealing with methane
 3
    production. It's the only way we're going to get to the
 4
 5
    solutions that we need to find in this industry.
 6
             The reality is, and the facts are, that every way
 7
    there is to reduce methane emissions in California
 8
    involves some level of other environmental tradeoff.
             Going to pasture dairies has a significant
 9
    environmental tradeoff. It's highly water insensitive in
10
11
    the San Joaquin Valley. Huge, huge implications. It's
                                                                FebEJAC-13
    also not good from an enteric emissions standpoint,
12
    because you have to have more cows to produce the same
13
    amount of milk.
14
15
             So we need to quit talking past each other.
                                                           We
16
    need to be invited in to the environmental justice
17
    community. We'd love to come. Let's bring the Air
18
    District, let's bring the Water Board, let's have a
    conversation about what the options are, what the
19
    solutions are, what the trade-offs are.
20
21
             We think we can get to a very sustainable
    position of not just reducing methane, but reducing
22
23
    criteria pollutants through the production of
24
    transportation fuel. That is a tremendous win-win
25
    opportunity that gets to the critieria pollutants that I
```

```
147
    heard all day yesterday as I sat through the EJAC meeting
 2
    that is truly of concerns to these communities. Let's
    have that conversation. We're willing to do it
 3
             Thank you.
 4
 5
             MODERATOR LUCERO: Thank you.
             Brent Newell. Brent. Oh, over there.
 6
             MR. NEWELL: Good afternoon. I'll make this
 8
    short. Members of the Board, members of the EJAC, Brent
    Newell. I'm with the Center on Race, Poverty, and the
    Environment. And, you know, the point I'd like to make is
10
    to build off of what Tom said. And, you know, as we move
11
    towards a 2050 target, 80 percent reductions from 1990
12
    levels, and even just to meet the 2030 target, we are
13
14
    transforming what we drive. We are transforming how we
15
    power our cars -- our homes, how we heat our homes.
16
             We also have to transform what we eat and how
17
    it's produced. Producing massive amounts of dairy
18
    products in California for export, or to feed millions of
    teenagers -- my teenager is kind of clueless about what he
19
    eats. He just shoves it in his face.
20
21
             You know, the point I want to make here is that
    we don't need to eat that amount of dairy products.
22
    can eat less, and eating less is better for the climate.
23
    Also, changing how it's produced is important. The
24
25
    pasture-based dairies, the methane -- the manure is
                                                              FebEJAC-14
```

```
148
    dropped on the pasture. It's decomposed in the absence or
    in the presence of oxygen and doesn't emit methane, unlike FebEJAC-14
 2
                                                                cont'c
 3
    those lagoons.
             It also helps this Healthy Soil[sic] Initiative
 4
 5
    that you're working on, where natural grass lands
 6
    sequester carbon. So we can have a win-win-win type
 7
    situation here with less air pollution, less methane, and
 8
    carbon sequestration through carbon farming.
             MODERATOR LUCERO: Thank you. Just do a quick,
 9
    we have no more public comment requests?
10
             BOARD CLERK McREYNOLDS: (Shakes head.)
11
             MODERATOR LUCERO: All right. Thank you for our
12
    public.
13
14
             So let's move on to what we agree to, what we
15
    need to work on. And we have some things that we may not
16
    resolve today, but I think we moved in a good positive
17
    direction.
18
             And I'm just going to point out that the
    agreements that I have listed up there are the things that
19
    I heard as your facilitator where I was hearing similar
20
21
    statements in terms of goals and objectives from both
    multiple EJAC members and multiple ARB Board members.
22
23
             So Katie, go ahead.
             EJAC MEMBER VALENZUELA GARCIA: I just want to
24
25
    express again how great this time has been, and also how
```

```
149
    short this time is. And there's a natural tension here
    between, I mean, just the time it would take for us to
 2
    have read through 140 recommendations and get clarifying
 3
    comments would have been most of the day, and then we
 4
 5
    would have never had any chance to give you context.
 6
             So I hope that our intention and foundational
 7
    beliefs that went into our recommendations were made
 8
    clearer today, but I also want to recognize that I feel
 9
    like additional conversations are still necessary, and we
    still need to start really hammering into where can we
10
    find common ground? Is common ground possible? If not
1 1
    possible, are there metrics we could be establishing that
12
    make us feel more comfortable? Are there other things
13
    that we could be doing?
14
15
             And so I -- and I know I'm kind of like -- sound
16
    like a broken record about this, but I just feel like
    there isn't time. I feel like we just don't have enough
17
18
    time to continue having this conversation with you all.
    And so I'd like to hear as part of these next steps, if
19
    after we do our next round of community workshops and we
20
21
    continue to refine our recommendations for the end of
    March, if another meeting with you all is possible in
22
    April, early April, and if that would leave staff and you
23
    all enough time to actually incorporate what we talk about
24
25
    into the final plan.
```

```
150
 1
             MODERATOR LUCERO: So that's something for
 2
    consideration. And it was a question we also had earlier,
    I believe, from the public in terms of process. Do we
 3
    have any thoughts now or do we want to have that as an
 4
 5
    action.
 6
             VICE CHAIR BERG: Let's hear the whole thing,
 7
    don't you think?
 8
             MODERATOR LUCERO: Yep.
 9
             Any other thoughts?
             Okay. Hector.
10
             BOARD MEMBER DE LA TORRE: I'll double back to
1 1
    where I started today, which was to break out the 140
12
    recommendations. And I realize that there may be a
13
    whittling down. But we can certainly categorize those
14
15
    140, and put them into, you know, cap-and-trade questions,
    regulatory issues, toxics issues, GGRF issues, where they
16
    fit, or external to CARB -- well, toxics would be one of
17
18
    those things, but maybe there's others -- and put them in
    the right bucket for us to talk about how we would proceed
19
20
    with each of those. And we can have a pro and con
21
    conversation. Staff can do an analysis, because at 140,
    it's a lot.
22
             (Laughter.)
23
             BOARD MEMBER DE LA TORRE: Thank you.
24
25
             BOARD MEMBER GIOIA: Are you going to be -- are
```

151 you going to be meaning to prioritize them further, I just 2 wondered? BOARD MEMBER DE LA TORRE: Given there's 700, 3 but -- in order to, you know, kind of break it down. And 4 5 I appreciate these categories, but we need to think about 6 where the right place is in terms of the government 7 agencies and the response to actually doing these, which 8 may be different. 9 So I think that would be very helpful for us to understand how we go about doing these, if we were to take 10 steps in those directions. 1 1 MODERATOR LUCERO: And we had a little bit of 12 13 folks talking over each other. John, you had a question and then Kemba your card is up. 14 15 BOARD MEMBER GIOIA: My only -- my question was 16 really just whether there was going to be additional discussion by EJAC as to whether it wanted to prioritize 17 18 some of these recommendations even further. EJAC MEMBER VALENZUELA GARCIA: Yeah. At our 19 meeting on March 29th and 30th we'll be making final 20 21 recommendations for you all for the final scoping plan 22 draft. 23 EJAC MEMBER ROSE TARUC: So in yesterday's EJAC meeting, one -- part of our process in coming to our final 24 25 recommendations is both to have a table that the staff has

```
152
   promised to us from the beginning that looks at our 140
2
    recommendations, tells us whether it is in the scoping
   plan or not, and if it's not there, why, so that we can
3
    have that conversation. And the EJAC could decide to make
4
5
    adjustments to their recommendations, so that they could
6
    be incorporated in there.
7
             But the staff has repeatedly failed to complete
8
    such a table, and we still don't have a table right now.
9
    So there's -- there's arguments with the staff
    and the EJAC about that. So we need to get that table.
10
    And what we had said was we need to get it next week,
1 1
    because within 2 weeks is the first of our next set of
12
    community workshops, because what we want to be able to
13
    tell and report back to the community, again, as, you
14
15
    know, the ambassadors to the scoping plan, the EJAC is
16
    fanning out again into our communities, and saying this is
    how your ideas from last summer made it into the scoping
17
18
   plan, or didn't make it into the scoping plan. And then
    so from there, what do you think is still priority for us
19
    to make sure we advocate for inclusion in the scoping
20
21
   plan?
22
             So we are going through that process. We're
    going to need that completed table from staff. We're
23
   going to report it back to the community through the
24
25
    workshops, and then we will come up with our final
```

```
153
    recommendations at our end-of-March EJAC meeting.
             And then we're hopping that then there is serious
 2
    time that staff who are writing the scoping plan are then
 3
    going to read those final recommendations and include it
 4
 5
    into the scoping plan before the final draft comes out.
 6
             MODERATOR LUCERO: Richard, here's a microphone.
 7
             EXECUTIVE OFFICER COREY: I got it. I wanted
8
    to -- I really need to respond to that, because I think
    it's really important, and that is, is that there's been
 9
    an absolute effort on the part of staff to be responsive
10
    to the recommendations in terms of how they map. And I
1 1
    know a few different forms of responses have been shared,
12
    and there was -- one that was discussed yesterday. And I
13
    know that they -- there's not been satisfaction in terms
14
1.5
    of the intent.
16
             The intent has been there, which is the
17
    description that Hector and others gave here, which is a
18
    recognition that with each of the recommendations, some
    map well the scoping plan, how can we be responsive, and a
19
    description of how we can be responsive.
20
21
             Some live somewhere else in terms of authority,
    how -- what's the follow up? What is that, and what is
22
    that -- what is actionable. In the point that was raised
23
    here, in some cases it may be an authority issue.
24
25
             And my understanding from the conversation that
```

```
154
    took place yesterday and this morning was I heard that
 2
    there was agreement on the format. And if that's -- we
    are finishing this. I mean, I'm personally committing to
 3
    get you what you just asked for, which was for each of
 4
 5
    those recommendations a summary of how they are addressed,
 6
    because many are addressed in the scoping plan, because
 7
    many of these issues -- and I think this is the challenge.
8
   Most of them it's not black and white, it's either in or
 9
    it's out, it's along a continuum.
             How can you best respond to the issue, what are
10
    the limitations, what are the constraints, and we need to
1 1
    be clear on that.
12
             Those that are clearly out, we need to call that,
13
    and call out that why -- why that is, but also indicate is
14
15
    there -- does it -- is there an opportunity with the new
16
    toxics rule, is the issue with respect to a local permit
17
    tightening?
18
             So that is -- that is the objective, and you've
    got a personal commitment from me to populate that, to --
19
    you have it, and let's move forward from here.
20
21
             MODERATOR LUCERO: Kevin and then Mary, and I do
    want to get back to the agreements and the parking lot
22
23
    items too.
24
             Kevin.
25
             EJAC MEMBER HAMILTON: So with regard to that, we
```

```
155
    did have a discussion. I think I had to get off the phone
 2
    because I was livecasting it from my office yesterday.
             So the suggestion that I had that I think
 3
    everyone agreed to, and I'm hoping that that's what was
 4
 5
    agreed to is that you annotate the existing plan with the
 6
    EJAC recommendations that made it into the plan.
 7
             It should be a fairly simple process. I have to
8
    write things all the time, reports, white papers that I
 9
    have to annotate. I mean, it's not like rocket science.
             Now, doing it from behind like this is a little
10
    more challenging where you have to reread and insert it,
1 1
    but that's really what we need here. So if I see a
12
13
    footnote, if I see a number, you know, a super script
    behind a sentence and it already -- you already have it
14
15
    footnoted already for other things, so add this document
16
    as one of those things.
             Now, we still want to illustrate the things that
17
18
    aren't in there and understand those, of course. But for
    the things that are or that are referred to, it would be
19
20
    great if it said Appendix A, energy and -- you know,
21
    energy and whatever, and, you know, page whatever, line
    whatever. Very simple to do.
22
             And I think that at least allows us to connect
23
    very easily to it as we're reading the plan. So at the
24
25
    bear minimum, that would be -- I think -- I appreciate
```

```
156
    the -- I looked at all the things that staff has created,
 2
    and I still don't know why we didn't do that from the
 3
    beginning.
             But man, they have put a lot of hours into this,
 4
 5
    and I respect that. The amount of time it takes to go
 6
    through something like this and do that crosswalking they
 7
    created, that's a yeoman's effort there.
 8
             But unfortunately, it didn't get us where we
    needed to be, which is to understand what's in the plan,
 9
    and what's not in the plan by looking at the plan.
10
    don't want to have to go to another document to look at
11
12
    that, right?
             EXECUTIVE OFFICER COREY: Thanks, Kevin. That is
13
    a clear explanation in terms of what's needed.
14
15
             So thank you.
16
             MODERATOR LUCERO: And I just want to capture,
17
    because I know, Kevin, you've mentioned this at a couple
18
    EJAC meetings, is you also -- because you didn't mention
    it here is for -- there were some items that the level of
19
    detail that the EJAC provided, because they're talking to
20
21
    the communities was on the ground. And I'm just
    reiterating what I've heard from you guys. So correct me
22
    if I'm summarizing wrong.
23
             So it's a lot of implementation stuff, and so it
24
25
    didn't quite seem relevant to the plan. So the other
```

```
157
    thing that Kevin has requested that if it is -- if it's
 2
    situation where the EJAC recommendation is too detailed,
    maybe do an annotation there of --
 3
             CHAIR NICHOLS: You're turing your head away, so
 4
 5
    I can't hear what you're saying.
 6
             MODERATOR LUCERO: Oh, sorry.
 7
             If it's a general -- a general -- it's too
 8
    specific to be in the scoping plan. Maybe annotate the
 9
    EJAC recommendation of, well, here's an example of what
    the EJAC has said might be a way to implement. So I
10
    just -- I wanted to make sure I captured that, because you
1 1
    had said it a couple times, and it's in the notes.
12
             EJAC MEMBER HAMILTON: Yes.
13
             MODERATOR LUCERO: Marv.
14
15
             CHAIR NICHOLS: Maybe I should have put my card
16
    down, because I think the last two exchanges helped.
    wanted to get to the point of saying specifically what do
17
18
    we do next to get to a document that we can have a
    conversation around what's in and what's out. And if you
19
    don't -- if you're not getting that yet, then I don't see
20
21
    much point actually in trying to go a whole lot further,
    other than in a broad generic way, because there's -- you
22
    know, I can't -- I can't rule on something, I can't make a
23
    decision on something without seeing facts in front of me.
24
25
             I disagree about some of the facts that people
```

```
158
   have referred to here today. That is in statements that
    were made about what is and what isn't, you know. But
 2
    I -- I don't think there's any point in having those
 3
    discussions until we see what's in the scoping plan, and
 4
 5
    what isn't in the scoping plan, and then we can go from
 6
    there. That's -- that is -- that is the document.
 7
             But I -- I would like to say, and I think in
8
    general, this -- you know, the conversation has been
 9
    everything I've hoped for and more. But when we get to
    the point of sounding like there's been some deliberate
10
    failure or refusal on the part of the staff to respond to
1 1
    comments from members of the EJAC or the EJAC as a whole,
12
    that does not resonate well with me, because I don't
13
    believe it's true.
14
15
             I mean, the product may not be where you want it
16
    to be, but the effort that has gone into it has been
    extraordinary. And the amount of literally blood, sweat,
17
18
    and tears that has gone in to attempting to satisfy the
    requests that have come from the group has been beyond
19
    anything I've ever seen before.
20
21
             So I don't -- I just don't want to have to get to
    a position where we have to argue about that aspect of it,
22
    if I can help it, because I would like to be able to wait
23
    until we have one more round of documents, and then talk
24
25
    off of documents.
```

```
159
 1
             MODERATOR LUCERO: And I do want to acknowledge,
    we did get an agreement and commitment to get the
 2
    cross-link table per the instructions earlier today. So
 3
    we have that.
 4
 5
             Mari Rose.
 6
             EJAC MEMBER ROSE TARUC: I also want to emphasize
 7
    the time that we need the information in order for us to
8
    be able to get as much of the advice from the EJAC into --
 9
    into the scoping plan. And so, yes, we see your staff
    working really hard. And then we're put under deadlines
10
    to get -- to get our recommendations in in order for us to
1 1
    see that they were included. And so even to now, middle
12
    of February, when we've had a good set of our
13
    recommendations since August to still not have a document
14
15
    that tells us where our recommendations were included, and
16
    to have this discussion with the Board about, you know,
    well, you know, if we actually did have that document and
17
18
    identified where staff disagreed with the EJAC, that would
    have been a really -- like more maybe animated
19
    conversation about which way to move forward, but we -- so
20
21
    this timing issue has been a challenge for the EJAC, based
    on response, or non-response, or delay that we've
22
    experienced with the ARB staff.
23
             And I also want to say, so right now what we're
24
25
    also working under in terms of timeline is that there's a
```

```
160
    comment deadline of March 6th for the comments to the
 2
    scoping plan, and so -- so right now our process is we're
    going to have these community workshops, get feedback from
 3
    many people through the end of March, our final
 4
 5
    recommendations then like -- is -- will our final
 6
    recommendations be addressed even in the analysis or as
 7
    official comments to the scoping plan or the environmental
 8
    analysis? Like I -- I'm unclear about that.
 9
             CHAIR NICHOLS: I wasn't going to answer that
    question. I was going to say something else, but it is to
10
    the earlier point, which is just that we started off
1 1
    talking about 148 or 44 regulations -- recommendations.
12
13
    Then coming into the meeting where the plan was presented,
    it had been sort of reduced down to 38 or 34 -- 38. 38.
14
15
             That's beginning to be a manageable number of
16
    things to actually talk about. You know, talking about
    144 items is like -- it's going through a checklist
17
18
    exercise. We could probably find, you know, some of them
    in various places that you wouldn't be satisfied with.
19
    And I think part of what I'm experiencing here is that I
20
21
    don't feel that people are addressing their true
    priorities really, because every time we get back together
22
    again it always comes down to if it doesn't include -- if
23
    doesn't -- if the plan does include cap and trade as the
24
25
    preferred option, or does not include something else as
```

```
161
    the preferred option, the EJAC is not going to be
 2
    satisfied that the plan was done adequately no matter
 3
    what.
             So let me just put that elephant in the middle of
 4
 5
    the room, and say it's here. It's in the middle of the
 6
    room, okay? And we can respond to that and we can talk
 7
    about that, about whether the analysis is being done
8
    correctly, whether the -- you know, whether the whole
    program is being designed correctly, or we can talk about
 9
    all the other things and set some priorities to them, but
10
    let's do it with some -- let's do it with some priorities,
1 1
    because otherwise, I don't -- I don't think that you're
12
13
    going to end up being satisfied.
             We may be able to say, yeah, we did the right
14
15
    thing, but, you know, it doesn't feel like the kind of
16
    relationship that one would have with an advisory group
17
    that, you know, was truly giving advice, as opposed to
18
    setting up an adversarial process.
             MODERATOR LUCERO: Diane.
19
             BOARD MEMBER TAKVORIAN: So again, I want to
20
21
    thank everyone for being here today. And for the time it
    took for everyone to prepare for this meeting and
22
    participate. I think that -- again, I do think it's
23
    historic and I appreciate Mary calling out the elephant.
24
25
    And I think that -- I hope that we can end this meeting in
```

162 a positive way, and in a way that really pushes us 2 forward. So, you know, one of the things that I think is 3 in the way in terms of the elephant is an insistence that 4 5 we stick with the April timeline. So I'd like to put it 6 on table, wherever that table is - unclear to me how this 7 happens - that we abandon the need to complete this in 8 April. We agree at the last meeting that we would consider moving it, and I think we have good evidence as 9 to why that should be moved. 10 One, we have -- we have workshops that are 1 1 extending through March. We won't have the EJAC 12 recommendations finalized, which we have said over and 13 over again that we want until the end of March. And if 14 15 the CEQA comment period ends on March 6th, let's be clear, 16 that is the legal end. So whatever staff or the Board does with those 17 18 comments is not sufficient. It has to be within the CEQA period from my perspective. So I'd like to put that out 19 to me, that's critically important. And without doing 20 21 that, I think we're disrespecting those comments. The other thing is is that while I think there's 22 a lot of attention on cap and trade, and on alternatives 23 that need to be analyzed, we were missing the OEHHA report 24 25 until a week ago. That analysis has not been done. The

```
163
    375 targets we keep talking about are -- are getting
 2
    processed. We're going to get a report in March. We're
    not going to have that now. That's huge, 38 percent of
 3
    GHGs. So where is that? How do we agree to a scoping
 4
 5
    plan that isn't clear on what the regions are going to do
                                                               FebEJAC-15
 6
    to reduce pollution from transportation, the response to
 7
    the Cushing report, so -- and the list goes on.
 8
             So with all due respect, it's not just about cap
    and trade, it's about holding two thoughts in our head at
 9
    the same time, which is there has been a lot of work that
10
11
    has been done all across the Board. And I really
    appreciate all of it from the staff, from the EJAC, from
12
    the public, and we have an incomplete product.
13
             So I think both those things are true. And I
14
15
    think with a few more months, we can have a complete
    product, and not one that I think we'll all agree on,
16
17
    okay? So that's not -- I don't think that's a reasonable
18
    goal. I don't think we'll all agree, but we will have a
    complete product that we can move forward with. And I --
19
    I just don't think we get there by April. And we
20
21
    certainly don't get there with a March 6th CEQA comment
    deadline.
22
23
             So I'd like to see us extend that.
             MODERATOR LUCERO: I want to see if we can get
24
25
    the deadline -- the timeline discussion going. So raise
```

```
164
    your hand if it's a timeline discussion. Keep your tags
 2
    up. Timeline?
             (Hands raised.)
 3
             MODERATOR LUCERO: Okay. Kevin, then John.
 4
 5
             Kevin.
 6
             EJAC MEMBER HAMILTON: So I just wanted to very
 7
    quickly address your comment. I agree with you that we
8
    need to avoid an adversarial position in any of this as
 9
   much as we possibly can, while still remaining true to the
    people who we're responsible to speak with and who've
10
    given their trust to us to speak for them. So that puts
1 1
    us all in very -- and you have the same bond, so we're all
12
    in a challenging position trying to keep fidelity and
13
    integrity to this. And I think everybody has done a
14
15
    pretty -- pretty damn fine job of that, including your
16
    staff and the Board, and I think the EJAC has as well.
             Sometimes that creates what I learned in, as a
17
18
    director in hospital, to term as healthy tension.
             (Laughter.)
19
20
             EJAC MEMBER HAMILTON: So sometimes a little
21
    tension in the room is really not a bad thing. And good
    things can come of that, as long as we're all working to
22
    at least consensus, which is always my goal, rather than
23
    full capitulation, which is what I want.
24
25
             (Laughter.)
```

```
165
             EJAC MEMBER HAMILTON: No sense in denying it,
    right? It's what we all want. I'm not going to lie about
 2
    it, speaking of elephants in the room.
 3
             (Laughter.)
 4
 5
             EJAC MEMBER HAMILTON: So we want to win. So --
 6
    and winning for us may look differently than it looks for
 7
    someone else. So -- so with regard to the timeline, we
8
    are running as fast as we can. I mean, when you -- when
 9
    you face us -- And I think speak about the valley here
    where I've got to set up now -- because of this deadline,
10
    somehow I've got to set up, as Richard got to see
1 1
    firsthand, meetings across this whole region
12
13
    simultaneously, because I only have one agency in the
    whole region that has the ability to do that, and that's
14
15
    the air district, which is always fun -- and I am being a
16
    little facetious there, yes -- to try to negotiate that,
    and then work together, and take those comments back from
17
18
    that community and somehow, under this timeline, get them
    assembled.
19
20
             And what they're going to be -- we're trying to
21
    work to make sure, by the way, that what they're
    commenting on is this new set of comments where we've also
22
23
    showed them where their original comments were translated
    into this work. So we're working hard at that you can
24
25
    assume, and it's -- again, it's a yeoman's task, as we
```

```
166
    used to say where I come from.
 2
             And it is -- it's hard work. You're doing hard
    work as well as -- and so is staff here. Everybody is
 3
    working hard. To denigrate that or disrespect that in any
 4
 5
    way, I can't tolerate, and I won't.
 6
             And I don't think anybody on this committee will.
 7
    We have to make statements sometimes that sound harsh,
8
    but, you know, that's politics too, right?
 9
             So we -- I just want to support what Diane is
    saying. And I think we all know that. I don't know why
10
    it's a big discussion. I understand someone outside this
1 1
    room has an agenda. We're all subject to different
12
    people's agendas. Sometimes they're hidden, sometimes not
13
    so much, but we don't have to allow that to happen.
14
15
             And I think we originally asked for, when I
16
    talked to Dean Florez about this originally, I said, Dean,
    you know, September would be great, but I'd take June.
17
18
    And he said I can -- you know, April.
             And I said yeah, maybe not so much, but whatever.
19
    I guess if that's what it's going to be, it's going to be.
20
21
    But here we are facing that, and I think we're
    recognizing, both from the Board's point of view and from
22
23
    ours, it just can't be done, not and be done well. So I
    like to do a job well whenever and always, so ...
24
25
             BOARD MEMBER GIOIA: I think it's an important
```

```
167
    discussion to have. I mean, it's always better to do
 2
    things thoughtfully and inclusively. I'd want to
    understand, you know, if there -- if we do discuss a time
 3
    frame change, you know, there's a difference between 1 or
 4
 5
    2 months versus a longer period, and trying to understand
 6
    the other things that are going on that would affect our
 7
    decision making about that.
 8
             So I don't know whether, Richard, you want to
 9
    comment now or tomorrow at our meeting a little bit about
    issues around the time -- about other parameters we're
10
    working under. So if we allow a change in the time frame,
1 1
    you know, what a reasonable amount is to achieve. It's
12
    always a balance, right? We're trying to allow more time.
13
    We're trying to get a plan going, given all the
14
15
    uncertainty in this country about this issue, and even in
16
    this State and how we move forward, but thoughtful is --
    and contemplative is good, so --
17
18
             CHAIR NICHOLS: John?
             BOARD MEMBER GIOIA: Yeah.
19
             CHAIR NICHOLS: I'm sorry, but I'm going to call
20
21
             BOARD MEMBER GIOIA: Okay. A question.
22
23
             CHAIR NICHOLS: -- flag on this one for the
24
    simple reason that tomorrow we have a Board meeting --
25
             BOARD MEMBER GIOIA: Right.
```

```
168
 1
             CHAIR NICHOLS: -- which is a noticed Board
 2
    meeting.
             BOARD MEMBER GIOIA: We can talk about it there.
 3
             CHAIR NICHOLS: We can talk about it then when --
 4
 5
             BOARD MEMBER GIOIA: And I said to Richard either
 6
   now or tomorrow. In my comments, I said, Richard, either
    now or tomorrow, to sort of we can comment about that.
8
             MODERATOR LUCERO: I think we've exhausted the
 9
    discussion of the timeline. There will be discussion
    on -- with -- by the Board tomorrow.
10
             So let's gets back to the kind next steps we need
1 1
    to talk about.
12
             Katie, was it the timeline?
13
             EJAC MEMBER HAMILTON: I think we should mention
14
15
    to the Board that it's -- we're not being disrespectful.
16
    Tomorrow, I think, Katie is the only one who can stay
    through tomorrow.
17
18
             So I just wanted to make sure --
             EJAC MEMBER TORRES: No, I'm staying too.
19
             EJAC MEMBER HAMILTON: What?
20
21
             EJAC MEMBER TORRES: I'm staying also.
             EJAC MEMBER HAMILTON: Oh, you're now staying
22
23
    also, Eleanor. Okay.
             EJAC MEMBER TORRES: I was all the time.
24
25
             EJAC MEMBER HAMILTON: So before we only had one
```

```
169
    person, so I was feeling like, wow.
 2
             MODERATOR LUCERO: No, it's always been Eleanor
 3
    and Katie.
             EJAC MEMBER HAMILTON: She just got a whole load
 4
 5
    on top of her, so I think -- yeah, so I just wanted --
 6
    that's not -- not that we don't want to.
 7
             CHAIR NICHOLS: You don't all have to show up at
8
    every meeting. Really, you don't. As long as whoever is
 9
    there can more or less speak for the group.
             MODERATOR LUCERO: So just to be clear, because
10
    Eleanor wasn't on the mic. Eleanor and Katie will both be
1 1
    there. Eleanor made the commitment to stay there. Luis,
12
    are you going to be there too?
13
             EJAC MEMBER OLMEDO: Yes.
14
15
             MODERATOR LUCERO: And Luis will be there too, so
16
    you'll have a full three.
17
             John and then Sandra.
18
             BOARD MEMBER BALMES: Thank you.
             So I just wanted to have a few summary comments
19
    on the record here.
20
21
             And since Mary put the elephant in the middle of
    the room, I want to reiterate what I said at the start,
22
    that while I think basically, just to acknowledge, cap and
23
    trade is going to be the preferred option. We'll have
24
    more discussion about it, but I think that's what's going
25
```

```
170
    to happen in the short term.
 1
 2
             But I think we should have an open mind and
    should be in the report that a carbon tax could be
 3
    considered a carbon fee could be considered in the future.
 4
 5
    That's what I want.
 6
            I think it's actually appropriate. It's not just
 7
    pandering to the EJAC. I think it's -- we might actually
 8
    need it in the future. Whether it's politically expedient
 9
    or not is another story. I don't claim to be that
    knowledgeable about political expediency.
10
             And the other point that was made by multiple
1 1
    people, which I really endorse, and I think this should
12
    also be in the scoping plan, is that to think about
13
    community benefits, health and economic. It don't just
14
15
    mean cap and trade. It's the whole kit and caboodle
16
    of our climate change mitigation policies under the
    scoping plan. I mean that's a basic principle that I
17
18
    believe in.
19
             And then -- and the Board members and staff
    will say there's John again about adaptive management.
20
21
    But I think what we're doing with adaptive management is
    pretty whimpy. I'm glad that there's something there.
22
    There's nothing in actually the current scoping plan about
23
    it, but we actually are doing a little bit, as you know.
24
25
             I also think that should be in the scoping plan,
```

```
171
    that we're -- we are going to address other pollutants
 2
    when we find a capped entity that's producing a lot of
    greenhouse gases. I mean, it's basically, to me, what's
 3
    in AB 32. So those are the 3, you know, sort of basic
 4
 5
    overarching principles that I think should be in the
 6
    scoping plan. It doesn't have to have paragraphs upon
 7
    paragraphs, but I think it should be in there.
 8
             VICE CHAIR BERG: Well, I don't know if we're
    doing wrap-up comments, but I did want to -- no, no, no.
 9
    I didn't -- I don't know if we are or not, but I did want
10
    to thank everybody. This has really been an extremely
1 1
    thoughtful and really very engaging.
12
13
             I think the biggest step is putting faces and
    names and being able to interact for the last almost 6
14
15
    hours. It really has been very impressive.
16
             But one of the things I wanted to follow up on
    is, as you go back to your communities, you know, one of
17
18
    the things we talked about is what parts of these can go
    into the scoping plan, what should we look for other
19
    avenues, what belongs to somebody else? How do we get the
20
21
    information to you as you go back out to your communities,
    so you can educate. You know, one of the things that I
22
    did as an owner, I -- I share my financials with all of my
23
    people from my people janitors all the way up to vice
24
25
    presidents in the same room. Everybody knows what the
```

```
172
    sales are, what the expenses are, what operating profit
 2
    is.
             But you can't do that if you don't help them
 3
    understand the zeros, because otherwise they don't have
 4
 5
    any context to put that in, other than they see a lot of
 6
    money up there. And so how do we give you the tools you
 7
    need so that you can take that back and people can feel
8
    listened to, and heard? And yet, we can't cover
 9
    everything in the scoping plan, because it doesn't
    necessarily belong there?
10
             MODERATOR LUCERO: Katie.
1 1
             EJAC MEMBER VALENZUELA GARCIA: I think, you
12
    know, we've come full circle to that initial idea, which
13
    is, is the cross-linked table with all of the
14
15
    recommendations, and with that level of data, and that
16
    transparency that Richard talked about, like, look, we
    need legislative authority, if we're going to do this.
17
18
    Look, it's Caltrans's authority to expand freeways if they
    decide to expand freeways, but to really explore like what
19
    ARB -- to Diane's point, because you've been given this
20
21
    model of making this plan that encompasses such a broad
    array of things, what can CARB commit to do to actually
22
    follow through with those agencies?
23
             Say, you know what, we're going to sit down and
24
25
    talk to Caltrans about induced demand, because it's crazy
```

```
173
    that just 2 weeks ago I heard senior planners there call
 2
    induced demand a theory, like it was some alternative fact
    out there, that if you expand freeways, you don't increase
 3
    congestion.
 4
 5
             (Laughter.)
 6
             EJAC MEMBER VALENZUELA GARCIA: So, like, what
 7
    can -- like, really having those internal conversations,
8
    because that's what we've been looking for since August,
 9
    is we've been looking for a document that tells us, not
    only did our recommendations get included in an appendix,
10
    but that staff talked about it, that they considered it,
1 1
    that they looked at what the options are, they looked at
12
    who was responsible, and they actually made a plan for you
13
    know what, if this is coming up, because it's not
14
15
    happening in the communities yet, and we know that it
16
    should be happening and it needs to happen, what more can
17
    we do?
18
             Can we just call the table together and have the
    conversation? And can we commit to that, so that people
19
    in our communities feel like they didn't come to a meeting
20
21
    and say oh, my gosh, why is the Cap City Freeway set to be
    expanded in 2020, the year that our climate goal is
22
23
    supposed to ratchet down. Moving forward, what can we do,
24
    what are our options?
25
             And we need ARB to be that champion, even if
```

```
174
    there's that natural political dynamic of not wanting to
    get in the air district's territory or other agencies. I
 2
    think that's a risk that we're willing to back you on, if
 3
    you're willing to make the commitment to help us figure
 4
 5
    out how to get that done.
 6
             EJAC MEMBER DINA ARGÜELLO: I'm remembering ARB's
 7
    land-use tool, and the production of that. This big. But
8
    it was a very collaborative process with a lot of
    environmental justice folks. And it addressed that,
 9
    right? Because what you hear in the community -- in
10
    that -- those communities are years of being unheard by
1 1
12
    multiple agencies.
13
            And so often you get -- you get a shotgun
    approach. And so -- and our job has been to sort of look
14
15
    through those and figure out, well, what fits. And even
16
    we who've worked within -- with the agency in many ways
17
    still struggle with that right, the responsibility, the
18
    role, but we have partnered before in giving best
    practices, right, and sort of strategic direction.
19
20
             And maybe there's a way to take those things that
21
    aren't in your purview, that we are hearing from
    communities, and figure out some -- that, right? Because
22
23
    at the end of the day you're responsible for the air and
    climate stuff, right?
24
             And these are drivers of more -- of more
25
```

```
175
    pollution. So figuring that out could be really exciting.
 2
    And that's whey we always think the life of this committee
    should go beyond this, because, you know, embedded in AB
 3
    32 that idea of don't make things worse is that
 4
 5
    recognition of the years of neglect and harm.
 6
             MODERATOR LUCERO: John.
 7
             BOARD MEMBER GIOIA: So for me the discussion
8
    reminds me a little bit of my experience 19 years
 9
    representing communities on the county board of
    supervisors. The communities express a vision, and that
10
    vision may involve action by varying levels of government,
1 1
    federal, State, county, city, and that it's important to
12
    sort of say, okay, here's what we can -- we have authority
13
    to do, here's what we may have authority to influence, and
14
1.5
    here's what we don't have direction authority to
16
    influence.
17
             And to the extent that items in the
18
    recommendations are a checklist, are really within the
    legislature's authority, more than ours, to really be
19
20
    honest and think about that, and maybe sort of separate
21
    out, and say here are the recommendations that are more
    specific where ARB has some either formal or informal
22
    authority, and then what are those in which, frankly,
23
    communities may be a better messenger to the legislature
24
25
    than ARB, right?
```

```
176
             To some in the legislature, ARB may not be the
    best messenger, but the communities may. So maybe it's
 2
    about -- as I get back to this point of sort of
 3
    prioritizing the recommendations, and really trying to
 4
 5
    separate out those that may involve action by other
 6
    agencies that we don't have -- where we may not be the
 7
    best messenger to influence those things.
 8
             So I think that's really deserving. And then we
 9
    will find after that process, I bet, that the
    recommendations that are directly to us are going to be
10
    less, somewhat less than the list. But it's important to
1 1
    have that discussion, because we want to honor that these
12
    are visions of communities, including my own, about things
13
    we want to achieve. But again, what's the venue where we
14
15
    achieve these things?
16
             MODERATOR LUCERO: All right. So we have 10
17
    minutes left, two more comments.
18
             Luis.
             EJAC MEMBER OLMEDO: I want to step out of the
19
    circle here. What I hear here is we have recommendations
20
21
    that are being presented. I hear that possibly some
    decisions that are already going to be made, or there's an
22
    inclination that there's some choices that are already
23
24
    going to occur.
25
             I don't think -- I think it goes beyond showing
```

```
177
    the numbers, and the transparency in those numbers.
 2
    There's a reason why there's a disadvantaged, and the
    disadvantaged is very clear. You have communities that
 3
    have a lot more access, a lot more influence, and then you
 4
 5
    have disadvantaged communities.
 6
             That's why these policies are being put in place.
 7
    This is a representation of that disadvantage of these
8
    marginalized communities.
 9
             Honestly, from where I sit looking at just -- not
    as a member, but let's say I remove myself, I'm just
10
    seeing a lot of sort of circulating, but no actions, no
1 1
    commitments. And I think that's been the concern all
12
    along. I haven't been in every EJAC. I've been in the
13
    last couple scoping plans, but I keep hearing the same
14
15
    thing. It's like we're bringing recommendations, but
16
    they're not being taken seriously.
             I've worked with BDOs for a while, and, I mean,
17
18
    there's things I still want to get done in the last 15
    years. And it's just like, you know, have a -- have a
19
20
    good friend that says (spoke in Spanish). You know that's
21
    in Spanish.
22
             You guys understand what that means?
23
             (Noes.)
             EJAC MEMBER OLMEDO: It's like stirring the --
24
25
    right, stirring the cup, but -- you know. And I don't
```

```
178
   mean disrespect or anything, but, I mean, there's a
2
    certain sense of reality that we have to face, you know.
             I don't see this going a whole lot anywhere. I
3
   hope -- I actually see progress here, because of this
4
5
    meeting, right? That's progress. That's great. But is
6
    that the only thing we're going to walk away with?
7
             I guess that's progress. I don't know. I'm not
8
    very hopeful. I mean I bring this whole issue of, like,
9
    real achievable things that we can do right here, like
    monitoring. And that's still, you know, (spoke in
10
    Spanish). We're going nowhere. And that's real small
11
12
    like.
13
            Like I don't know how we're going to really take
    the bigger recommendations, the more transformative. I
14
15
   just don't -- I don't know. I'm still waiting. I'm
16
    hopeful.
17
            MODERATOR LUCERO: Mary.
18
             CHAIR NICHOLS: I want to yield to everybody
    else, because I want the last word.
19
20
             (Laughter.)
21
             BOARD MEMBER GIOIA: I quess the Chair gets that
    prerogative, right?
22
23
             (Laughter.)
            MODERATOR LUCERO: John, do you still have more
24
25
    comments?
```

```
179
             BOARD MEMBER GIOIA: No.
 1
 2
             MODERATOR LUCERO: Okay. Kemba.
             EJAC MEMBER SHAKUR: I could not resist bringing
 3
    this issue up, because the Committee members are in here.
 4
 5
    That's a picture of Urban Releaf planting trees at
 6
    Aviation High School with the Golden State Warriors.
 7
    That's he work that I do in my community -- or we do in
 8
    our community. I don't like to say the word "I".
 9
             But we receive GHG funds, and we're really happy
    about it. It gave us the opportunity. After 18 years,
10
    we've never seen funding like this. And it's allowed us
1 1
    to do a lot more.
12
13
             But when Judy Mitchell spoke about going back to
    your city and looking at issues of your city, it made me
14
15
    kind of think about -- I think it might have been you,
16
    Hector De La Torre.
17
             (Laughter.)
18
             EJAC MEMBER SHAKUR: I think it might have been
    you or that man that was sitting there. We were at a UCLA
19
20
    conference like a couple years ago, and it was you or him
21
    that said, I don't want to see this funding going for new
    cars, and new desks, and office stuff. I want to see this
22
23
    funding go to the community. Was that you?
             BOARD MEMBER DE LA TORRE: It sounds like me.
24
25
             (Laughter.)
```

```
180
             EJAC MEMBER SHAKUR: Yeah, that sounds like you.
 2
             I think it was you.
             But, you know, I -- it's really hard work. It's
 3
    not easy work. You know, Andy Lipkis talks about the
 4
 5
    simple act of planting a tree. The tree part might be
 6
    easy, but the concrete ain't.
 7
             (Laughter.)
 8
             EJAC MEMBER SHAKUR: But, you know, we received
 9
    funds, but another city agency received the funds too.
    But then that city agency gave their funds to 2 guys who
10
    are members of Sierra Club in San Francisco. So now, my
1 1
    organization, Urban Releaf, is competing with Sierra Club,
12
    in the flat lands of Oakland.
13
             And it just -- it's created a multitude of issues
14
15
    and problems. You know, I -- it's -- it's not easy
16
    getting people to plant trees -- I mean, to want trees.
    You've got to go to the owners. The residents can't do
17
18
    it, so you're already -- you know, it's a lot of work. I
    don't want to go into it.
19
20
             But I just want to say is that there needs to be
21
    a strategy -- anti-displacement strategies, so that people
    can't just come into your city and use big words like
22
    "Sierra Club", and, you know, push you out of your own
23
24
    city.
25
             MODERATOR LUCERO: All right. We have 5 minutes
```

```
181
    left. Any other comments?
 2
             Okay. Closing remarks.
             CHAIR NICHOLS: Well, thanks. Actually,
 3
    Stephanie was going to do the closing remarks, but I
 4
 5
    actually did want to be heard on the points that we've
 6
    just been talking about.
 7
             And particularly I think in response to Luis, but
8
    also to Kemba. Thank you so much. I have been -- I've
 9
    been involved in a lot of tree planting issues over the
10
    vears.
             EJAC MEMBER SHAKUR: Four earth days.
1 1
             CHAIR NICHOLS: I know what you're talking about.
12
    I totally know what you're talking about.
13
             I think it would be sad if people left without
14
15
    having a moment to acknowledge at least how much has been
16
    accomplished under AB 32 in terms of what the greenhouse
    gas funds have already begun to a accomplish. Even though
17
18
    we've only had them for a couple of careers, we have seen
    a lot. We haven't -- one of the areas where we've not
19
    done as good a job as we should have, and this was
20
21
    internal difficulties within the State, is just getting
    the information out, so people could see where the grants
22
23
    were going, and what they were doing.
             This was government tripping over itself. So,
24
25
    you know, I'm not here to defend everything that
```

182 government does or that ARB does, but I do want us to also 2 recognize that there have been some very big things that people have worked on under the greenhouse gas rubric. 3 And one of the things that I am the most excited 4 5 about, which didn't come up today, and, John Balmes, you 6 haven't been around for a little while, so I'm going to 7 take you on on adaptive management. I've think we've 8 moved beyond adaptive management. 9 We've got AB 197 now, which was part of -- part of SB 32. And that's giving us very specific direction. 10 This is not just about, you know, fixing problems. It's 1 1 about moving towards a much more holistic approach to 12 toxics and health-based air pollutants at the same time 13 that we're working on climate change. This is -- involves 14 15 a huge shift in paradigm, and it's cross-cutting. 16 And, you know, my agency, I think, has been as fast to adapt as any ever in any bureaucracy that you 17 18 could find, but still, you know, we're -- you know, it's a hard thing to do to break down all those silos, and break 19 20 down all those barriers that have existed for so many 21 vears. 22 We need you. This isn't just something that 23 we're, you know, putting up with. We have to have better ways to relate to communities. And the work that you are 24 doing is essential work, and it's also, I understand, and 25

```
183
    some of you have said it directly, it's hard work.
   hard to be a translator, to be a middle person, to have
 2
    to, you know, move between one set of people and one set
 3
    of ways of dealing with these things and other, and try to
 4
 5
    really be relevant and be useful.
 6
             So I am really overwhelmingly grateful to all of
 7
    you for having given us your time so far. And I just want
8
    to say that I am going to be thinking about what I heard
    here today, and that tomorrow at the Board meeting, I do
 9
    expect to address the issue of what happens next in terms
10
    of the timeline.
1 1
             So that's all I'm going to say right now, but I
12
    thank you, and we'll see you tomorrow.
13
             MODERATOR LUCERO: Do we want a real quick
14
15
    summary from your neighborhood facilitator of what you
16
    guys did accomplish today and not just on AB 32?
17
             John, is that a yes or a no.?
18
             (Laughter.)
             BOARD MEMBER BALMES: No.
19
20
             (Laughter.)
21
             BOARD MEMBER BALMES: I just want to respond
    to -- sorry. I just wanted to respond to the shout-out
22
    from Mary. I'm really glad that you brought up AB 197,
23
    because that actually should make us change our culture
24
25
    and paradigm. And, yeah, that's more important than
```

```
184
    making sure that adaptive management is in the report --
 2
    the scoping plan, but I still would like it to be in the
 3
    scoping plan.
             (Laughter.)
 4
 5
             MODERATOR LUCERO: I'm going to force you to
 6
    recognize what you accomplished today.
 7
             And I'm sorry, it's going to be fast.
 8
             So this was a historic moment, sitting down
 9
    talking with each other about where you come from, what
    your issues are, what your concerns are, having the
10
    opportunity to ask questions of why is that important, how
1 1
    is that important? Let's acknowledge that, and thank you
12
    for taking the time to be here and doing that and braving
13
    the traffic.
14
             (Applause.)
15
16
             MODERATOR LUCERO: Agreements. From both sides,
    EJAC and ARB, an acknowledgement that public health is an
17
18
    important focus, making sure that AB 32, the scoping plan
    addresses improved health for Californians, and addresses
19
    the issues of EJAC communities.
20
21
             The urgency of resolution, that something needs
    to be done to address the concerns, and an acknowledgement
22
    that that may not be in the scoping plan. It's a plan.
23
    So maybe there's a need to look outside of the scoping
24
25
    plan to figure out how to resolve some of these issues.
```

185 Everybody talked about better and greater data metrics. Better data, more -- better understanding of 2 data, so we know what the problem is and how to resolve 3 it. That doesn't mean that we ignore existing data. We 4 5 may not have all the data and all the metrics we want. There is some data out there. The issues are urgent. 6 7 Let's see what we can do with the data we have. 8 Look at the full scope of the issues, as well as 9 the resolution. There's a lot of discussion about coordination, the role that CARB may or may not play. 10 They didn't commit, but they definitely said let's think 1 1 about what role can CARB play in coordinating amongst 12 those agencies? 13 Where can we push the bounds within the limits of 14 15 our capability in order to push these discussions. And 16 that was seen throughout in a lot of the parking lot items. Food for thought. Not agreements, but food for 17 18 thought from CARB of how do we see what type of steps need to be taken beyond what the scoping plan is, how can the 19 20 scoping plan respond to things that are outside ARB's 21 authority, how can local agencies' compliance regulations, how can we get consistency there, how can we motivate 22 23 that? You haven't resolved that, but that's a question 24 you're asking. And I think that's an important thing, 25

```
186
    because it's definitely something that the EJAC has
 2
    expressed an interest in.
             Other items that came up is just next steps.
 3
    can we identify what other agencies would be responsible
 4
 5
    for some of the EJAC recommendations? We got a commitment
 6
    for the cross-link table, and some of that might be
 7
    include. And then we also got a commitment to continue
 8
    that.
 9
             Now, the other -- this is consistent with both
    agreements of something that needs to be considered, and
10
    then also we still need to figure out how to do it, but
1 1
    that's finding a commonality for the air districts related
12
    to toxic controls and figuring out how to engage
13
    communities.
14
15
             And I think we all acknowledged and greed that
16
    the EJAC and the organizations and communities you
    represent here are a vital component to brining the ground
17
18
    truth, the issues that you're seeing, the 700
    recommendations that you got from your community workshop,
19
20
    and help filter that up to the scoping plan.
21
             It's at 140 now. It might stay at 140, but
    hopefully it can be filtered more, so that there's a
22
    better understanding of what's going on in the ground, and
23
    how the scoping plan impacts that. And so continued
24
    discussions are important, and continued discussions will
25
```

```
187
1
    happen.
 2
             I want to thank you all for staying here till
3
    6:00 p.m. Drive safely. Have a wonderful evening.
             See some of you tomorrow.
 4
 5
             (Applause.)
              (Thereupon the Air Resources Board and EJAC
 6
 7
             joint meeting adjourned at 6:03 p.m.)
 8
 9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
```

188 CERTIFICATE OF REPORTER 2 I, JAMES F. PETERS, a Certified Shorthand 3 Reporter of the State of California, do hereby certify: That I am a disinterested person herein; that the 4 5 foregoing California Air Resources Board meeting was 6 reported in shorthand by me, James F. Peters, a Certified 7 Shorthand Reporter of the State of California, and was 8 thereafter transcribed, under my direction, by 9 computer-assisted transcription; I further certify that I am not of counsel or 10 attorney for any of the parties to said meeting nor in any 11 12 way interested in the outcome of said meeting. IN WITNESS WHEREOF, I have hereunto set my hand 13 14 this 28th day of February, 2017. 15 16 17 18 James 4 19 20 21 22 JAMES F. PETERS, CSR 23 Certified Shorthand Reporter 24 License No. 10063 25