

State of California
2030 TARGET SCOPING PLAN UPDATE
CONCEPT PAPER
June 17, 2016

Executive Order B-30-15 established an updated California GHG reduction target of 40 percent below 1990 levels by 2030. California Air Resources Board (ARB) staff is providing this 2030 Draft Scoping Plan Update (Draft Scoping Plan) concept paper to describe potential policy concepts to achieve the 2030 target. The content of this paper has been informed by several public workshops and meetings held to date, beginning with the Governor's Climate Change Strategy Pillar Workshops held in summer 2015. Since then, ARB staff, in collaboration with other State agencies, has held numerous public workshops to develop the Draft Scoping Plan, including several Environmental Justice Advisory Committee meetings, a public meeting to discuss the greenhouse gas (GHG) modeling and economic analysis that will be included in the Draft Scoping Plan, and other sector-specific public workshops. These multi-agency meetings provided State agencies the opportunity to share their near- and long-term visions for climate policy and actively solicited the public's comments, concerns and questions. A full list of the Draft Scoping Plan workshops held to date can be found on ARB's Scoping Plan website:

<http://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>.

This paper provides additional opportunities for public and stakeholder engagement and input prior to release of the Draft Scoping Plan later this year. The intent of the paper is to inform an ongoing stakeholder process for how to most effectively achieve a 40 percent reduction in GHG emissions by 2030 as compared to 1990 statewide GHG emissions. The process going forward will include additional workshops that will be held in 2016 and early-2017. All written comments submitted on this paper will be posted for public review at the website below, and will be reviewed by State agencies as we continue to coordinate on proposing final concepts for evaluation and consideration through the ongoing public process. Comments on this paper will be considered as the Draft Scoping Plan is developed and released for public review in summer 2016. Comments on this paper can be submitted through July 8, 2016, here:

<http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

Introduction

California has been a leader in addressing greenhouse gases (GHGs) since the passage of Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (AB 32, Statutes of 2006, Chapter 488), which represented a defining moment in California's long history of environmental stewardship and secured the State's role as a leader in reducing greenhouse gas (GHG) emissions. California seeks to fight climate change by employing a comprehensive, long-term approach to cut the State's GHG emissions to 1990 levels by 2020 and to maintain and continue reductions post 2020. Since the time the first energy efficiency requirements were adopted, to the Renewable Portfolio Standard (RPS), to the Pavley Advanced Clean Car Standards, and the recent proposed Short Lived Climate Pollutant Strategy, the State has been consistent and bold in its efforts to address climate change and serve as an example of how other regions can take similar action in reducing GHGs.

California is currently ranked as the world's sixth largest economy, up from number ten in 2012. Yet we reduced GHGs per capita and GHGs per gross domestic product while steadily growing the economy. Over the past half a century, we have made great strides in addressing air pollution and continue to seek and implement new policies to meet national and state air quality standards. At the same time, the State is on its way to reducing GHG emissions to meet the 2020 limit and accomplish our longer-term climate goals.

California's current climate program relies on a mix of an economy-wide cap with a market-based allowance trading system, accompanied by a suite of sector specific policies such as an RPS for electricity, a low carbon fuel standard, and strong vehicle emission standards. But, all these policies need to be reexamined and in some cases may require legislative reauthorization.

Despite California's marked progress, greater innovation and effort is needed to avoid the worst consequences of climate change. Recognizing the threat to California's future, Governor Brown called on California to pursue a new and ambitious set of objectives to continue to reduce GHG emissions by 2030 and beyond. In his January 2015 inaugural address, Governor Brown identified five key climate change strategy "pillars," which recognize that several major areas of the California economy will need to reduce their emissions to meet California's ambitious climate change goals. These five pillars are:

1. Reducing today's petroleum use in cars and trucks by up to 50%;
2. Increasing from one-third to 50% our electricity derived from renewable sources;
3. Doubling the efficiency savings achieved at existing buildings and making heating fuels cleaner;
4. Reducing the release of methane, black carbon, and other short lived climate pollutants; and
5. Managing farm and rangelands, forests and wetlands so they can store carbon.

Consistent with these goals, Governor Brown signed Executive Order B-30-15 in April 2015 establishing a California GHG reduction target of 40 percent below 1990 levels by 2030. This new emissions reduction target represents the most aggressive goal set by any government in North America to reduce GHG emissions over the next decade and a half. This new target is consistent with the path necessary to reach the scientifically established levels needed to limit global warming below 2 degrees Celsius (°C) – the warming threshold at which scientists agree that there will likely be major climate disruptions – and aligns California's GHG reduction targets with those of leading international governments.

Executive Order B-30-15 calls on ARB to update the AB 32 Climate Change Draft Scoping Plan to incorporate the 2030 target. The Draft Scoping Plan will serve as the framework to define the State's climate change priorities for the next 15 years and beyond. In addition, this Draft Scoping Plan will recognize the intersection of the pillars and the imperative to balance the outcomes of each pillar as we achieve our climate goals and maintain California's values and iconic and lifestyles.

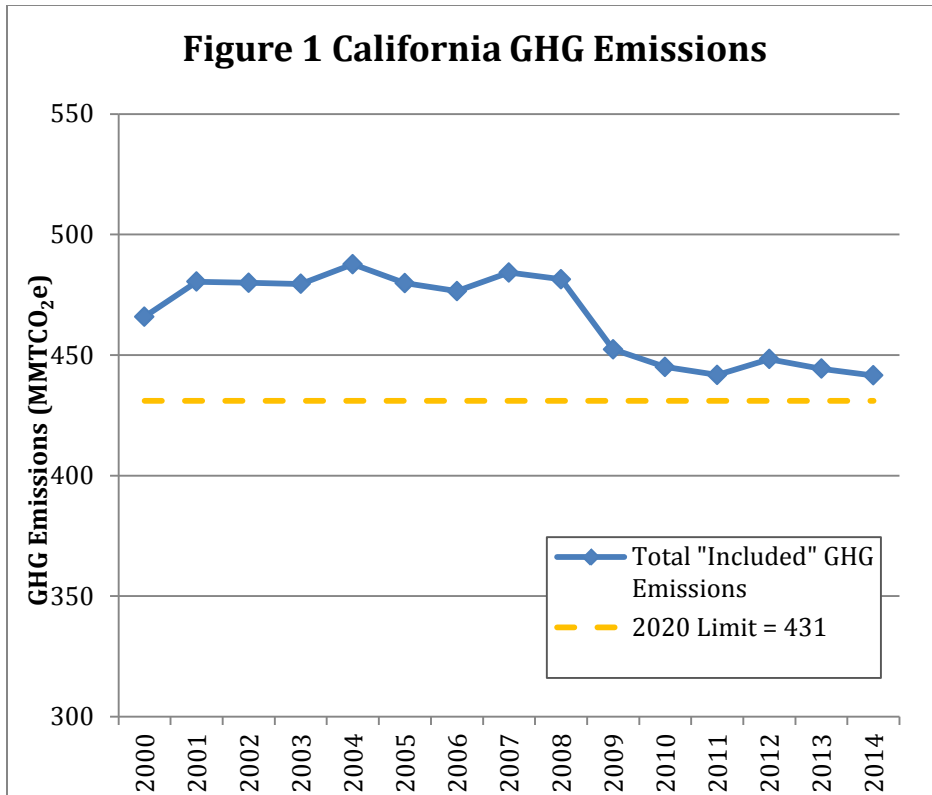
The 2030 target reflects the same science that informs the recent agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change, aimed at keeping the global temperature rise below 2°C. California continues to play a leadership role by demonstrating that reducing carbon is compatible with a robust economy. Like California, other subnational jurisdictions are ready to take action. With the Under 2 MOU, which originated from a partnership between California and Baden-Wurttemberg, 128 jurisdictions have signed on to the goal of limiting GHGs 80 to 95 percent, or 2 metric tons per capita carbon dioxide equivalent emissions by 2050, leading the way for the world.

Progress

California has made progress toward achieving the 2020 statewide GHG target while also reducing criteria and toxic pollutants and supporting economic growth. As shown in Figure 1, in 2014, total GHG emissions decreased by 2.8 million metric tons of CO₂ equivalents (MMTCO₂e) compared to 2013, representing an overall decrease of 9.4% since peak levels in 2004. The 2014 GHG Emission Inventory and a description of the methodology updates can be accessed here: <http://www.arb.ca.gov/cc/inventory/inventory.htm>

California's annual statewide GHG emission inventory, which was used to create Figure 1, has historically been the primary tool for tracking GHG emissions trends. Aligning this inventory with the Intergovernmental Panel on Climate Change (IPCC) guidelines allows California to share a consistent method to compare GHG profiles with other subnational jurisdictions and nations.

The 2014 GHG Emission Inventory (2016 Edition) includes improved methodology updates. For example, to align the GHG inventory with the IPCC guidelines, starting with 2014 GHG Emission Inventory, ARB is separating biogenic CO₂ from transportation fuels from the total emissions and tracking those emissions separately as informational items. Figure 1 provides the GHG inventory trend using this new method. Additional information on the methodology for the GHG inventory can also be found here: <http://www.arb.ca.gov/cc/inventory/inventory.htm>



Although the inventory will remain critical piece for GHG accounting, it can now be supplemented using data derived from individual GHG emissions reducing programs. In the Draft Scoping Plan, to better track progress towards achieving our statewide GHG targets, we will explore how to structure an accounting framework that uses the GHG inventory, but incorporates GHG emissions related to land use conversion when biofuels are produced and supplied to California as a result of our Low Carbon Fuel Standard. We will also explore how flows of cap-and-trade program compliance instruments between California and Québec can be incorporated into such an accounting framework.

The exchange of carbon dioxide between the atmosphere and California's natural and working lands sector is not currently quantified and is excluded from the inventory. A natural and working lands carbon inventory is essential for monitoring land-based activities that may increase or decrease carbon sequestration over time. ARB staff is working to develop a comprehensive inventory of GHG fluxes from all of California's natural and working lands using International Panel on Climate Change (IPCC) design principles. The Draft Scoping Plan will describe ARB's progress and identify data gaps. Other state agencies, non-profit organizations, and research institutions are developing and testing methodologies and models to quantify GHG fluxes from California's natural and working lands. ARB's ongoing work on this inventory will serve as

one source of data to gauge the scope of GHG reduction potential from California's natural and working lands and monitor progress over time. ARB will evaluate other data sources and methodologies for use in validating or supporting the ARB inventory or project-scale tracking. As discussed later in this paper, interagency work is underway to integrate and account for the land use and management impacts of development, transportation, housing and energy policies into this Draft Scoping Plan.

The Strategy

"The whole is greater than the sum of its parts." - Aristotle

Integrated System

From our coasts to our mountains, surfers, hikers, skiers, mountain climbers, fishing enthusiasts, and many others, share a passion for California's natural landscapes. Our State Parks also reflect a rich cultural history that includes Native American, Spanish, Mexican, Asian, European, U.S. and other influences. California has a diverse economy – from energy production to manufacturing to farming to technology to cinema and goods movement. As we chart a path to achieving the 2030 and 2050 GHG targets, we must care for the whole. In the context of the Draft Scoping Plan, caring for the whole means considering California as more than the sum of its sectors. Actions in one sector need to take into account their impacts on other sectors.

To establish a comprehensive approach to achieve the State's climate goals, the plan will incorporate multiple ongoing State efforts. For example, as we address future mobility, we must show how existing efforts underway – such as the Sustainable Freight Plan, Mobile Source Strategy, California Transportation Plan 2040, urban planning, and goals for enhancement of the natural environment – can complement each other while providing air quality and climate benefits. Each of these efforts is important in its own right, but looked at together they provide insights into the trade-offs of policies across all sectors and tell a larger story about how the State will move towards a sustainable and resilient future. The Scoping Plan can help identify the policy choices that will minimize costs and optimize "win-win" solutions, while also recognizing that it is often difficult to accomplish all of the State's goals at the same time.

Flexibility

Strategies to reduce GHG emissions vary and require ongoing evaluations to accommodate innovation and change. Actions and tools recommended by the Draft Scoping Plan must include a flexible framework for implementation. Combinations of regulations, incentives, voluntary action, private-public partnerships, and support from non-governmental organizations can be leveraged together to promote desired actions and achieve 2030 climate goals. The Draft Scoping Plan will include a discussion about the important role that each of these tools play alone and together, and provide illustrative examples of successful implementation of these tools to date. With 2050 in mind, we need to find ways to encourage innovation and voluntary actions today that support and exceed the policies and measures we include in this Draft Scoping Plan.

The State will need to encourage and support near-term actions to reduce emissions through financial incentives, collaboration to overcome barriers, and other market support as needed, before some potential regulations will be feasible. We also know that successful long-term planning is achievable only through a collaborative process. For example, Caltrans is looking to maximize collaboration and leverage funding through an integrated approach to planning, designing, building and operating transportation assets. Integrating local, regional, and State priorities can help identify opportunities for strategic investment that addresses multiple mobility objectives, and collaboration between public and private stakeholders ensures the built system addresses future needs and functions appropriately.

Promoting Resilient Economic Growth

The existing policies, strategies, plans, and regulations that we already have in place are helping many California businesses to better compete in a global economy, and have created new investments, businesses, and jobs to support a clean energy economy. We have learned that California's portfolio-based climate strategy can achieve great success when accompanied by consistent and rigorous GHG monitoring and reporting, a robust public process, and an effective enforcement program for the few that chose not to play by the rules. Our experience has also shown us that California's economy and infrastructure can be strengthened while also achieving other important environmental benefits such as reductions in criteria pollutants and air toxics, especially in California's most vulnerable communities.

The benefits achieved as a result of the Draft Scoping Plan are part of California's comprehensive strategy to achieve lasting emissions reductions throughout the economy. California's strategic vision for achieving a 40 percent reduction in GHG emissions by 2030 is based on the principle that economic prosperity and environmental sustainability can be achieved together. Undertaking the actions that will be presented in the Draft Scoping Plan presents opportunities for the future, but progress towards our goals is already evident today. For example, in 2015, California added more than 20,000 new jobs in the solar sector. This was more than half of the positions in this industry across the nation.

Achieving our global goals requires a structural shift in the global economy, which is already underway. Successfully driving this transition will require cleaner and more efficient technologies, new policies and incentives that better recognize and reward innovation, and prioritize low carbon investments. These fundamental shifts will create economic opportunities in the energy and transportation sectors leading to transformative changes in the management and conservation of our natural and working lands, land use, and urban environments. These efforts are already underway, as highlighted through the development and implementation of Sustainable Communities Strategies (SCSs) pursuant to Senate Bill (SB) 375, which link land use, transportation and climate policy, and are designed to reduce per capita GHG emissions while providing benefits ranging from improved air quality and expanded transportation options to revitalization of city centers and investment in disadvantaged communities. SB 375 is just one of many ways to address land use and provide climate benefits. The Draft Scoping Plan will identify new ways to promote the technologies and infrastructure required to meet our collective climate goals, while also presenting the vision for California's continuing efforts to foster a clean energy economy.

Protecting, Enhancing, Innovating, and Increasing Sequestration in the Natural Environment

California's natural and working lands are unique and widely celebrated. The State's quarter depicts Yosemite Valley's Half Dome and conservationist John Muir, highlighting the State's self-identification with its natural landscapes. These lands support clean air, wildlife and pollinator habitat, and vibrant rural economies. They are home to the largest and most diverse sources of food and fiber production and renewable energy in the United States. Forests,

rangelands, farms, wetlands, riparian areas, deserts, coastal areas, and the ocean store substantial carbon in biomass and soils.

Natural and working lands are integral to the State's climate change strategy. Storing carbon in trees, plants, aquatic vegetation, and in the soil is one of the most effective ways to remove GHGs from the atmosphere. The Draft Scoping Plan will include policies and programs that prioritize protection and enhancement of California's landscapes, including urban landscapes. As we think about the policies to include in the Draft Scoping Plan, we cannot ignore the relationships between sectors or the adverse impacts that climate change is having on the environment itself. We must consider important trade offs in developing the State's climate strategy and understand the near and long-term impacts of various policy scenarios on topics such as farmland conversion, urban sprawl, and increased vehicle miles traveled (VMT). We must also address the increasing trend in the severity of wildfires in California due to climate change, and understand how best to increase carbon sequestration in forests and other natural lands over time. The Draft Scoping Plan will build off of ongoing efforts to identify targets for natural and working lands, such as through the Forest Carbon Plan,¹ and identify policies that directionally set us on the path towards achieving the vision for the sector even in the face of scientific and methodological uncertainty.

A Draft Scoping Plan workshop held on March 23, 2016, focused on the natural working lands sector.² As described at the March 2016 workshop, the high-level objectives for the State's strategy for natural and working lands include:

- Increase protections on natural and working lands to reduce the rate of conversion to intensified uses, to both preserve lands' sequestration potential and promote infill and compact development.
- Manage and restore land to increase carbon storage and minimize GHG emissions in a sustainable manner so that the carbon bank is resilient and grows over time.
- Seek synergies that optimize contributions from natural and working lands while sustaining local economies by researching and developing appropriate bioenergy, food crop, water system and waste management technology, as well as product manufacturing, that serves to support sustainable resource management.
- Harness nature's benefits through urban greening to reduce GHG emissions and increase carbon storage in urban landscapes; cool urban

¹ Forest Climate Action Team website: <http://www.fire.ca.gov/fcat/>

² The materials for this workshop are located here: <http://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>

heat islands; encourage active transportation, reduce air and water pollution; allow for groundwater recharge; improve energy efficiency, and; improve human health and community resiliency.

As discussed later in this paper, the GHG modelling and economic analysis that will be included in the Draft Scoping Plan will illustrate possible policy scenarios that can help the State to achieve the 2030 and 2050 GHG reduction targets. Each policy scenario evaluated in the Draft Scoping Plan will include the abovementioned four high-level objectives in order to ensure we achieve the vision for the State's natural and working lands. How these high-level objectives translate to specific policies and implementation mechanisms will be part of the ongoing discussion with stakeholders.

The list of natural working lands objectives for the Draft Scoping Plan are discussed in detail in the Natural Working Lands Discussion Paper found here: <http://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>

Improving Public Health

Climate change is already impacting the health of our communities. Those facing the greatest health inequities include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender, race/ethnicity, or sexual orientation.³ Addressing climate change presents a significant opportunity to improve public health for all of California's residents and work towards making our State the healthiest in the nation.

Climate mitigation efforts focus primarily on moving "upstream" to reduce GHG emissions at the source. Upstream GHG mitigation strategies address the root cause of impacts thereby preventing adverse health outcomes and promoting multiple benefits including long-term community health and well-being. Public health and climate actions and interventions exist on a spectrum and can often overlap and address multiple issues simultaneously. For example, certain "upstream" measures to reduce GHG emissions, such as improvements in the built environment, can help communities better adapt and be more resilient to climate impacts, can promote long-term, durable community health benefits, and can also improve individual health conditions. As part of the Draft Scoping Plan, we will present a public health assessment that will discuss key statewide climate

³ California Department of Public Health (CDPH). 2015. The Portrait of Promise: The California Statewide Plan to Promote Health and Mental Health Equity. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

mitigation measures and their potential impacts on public health, especially co-benefits, such as reductions in criteria and toxic air contaminants.

Environmental Justice

Fair and healthy climate action requires addressing the inequities that create and intensify community vulnerabilities. The capacity for resilience in the face of climate change is significantly driven by living conditions and the forces that shape them, such as income, education, housing, transportation, environmental quality, access to services such as health care, healthy foods and water, and safe spaces for physical activity, and good health status. Thus, strategies such as alleviating poverty, increasing access to opportunity, improving living conditions, and reducing health and social inequities will result in more climate-resilient communities. Promoting a low-carbon California economy will reduce GHG emissions and create a healthier environment for all of California's residents, especially those living in the State's most disadvantaged communities.

It is important to note that both climate change and the health inequities we see in our communities share similar root causes: the inequitable distribution of social, political and economic power. These power imbalances result in systems (i.e. economic, transportation, land use, etc.) and conditions that drive both health inequities and GHG emissions. As a result, we see communities with inequitable living conditions, such as low-income communities of color living in more polluted areas, facing climate change impacts that compound and exacerbate existing sensitivities and vulnerabilities. Fair and healthy climate action requires addressing the inequities that create and intensify community vulnerabilities.

AB 32 calls for ARB to convene an Environmental Justice Advisory Committee (Committee), to advise the Board in developing the Draft Scoping Plan, and any other pertinent matter in implementing AB 32. It requires that the Committee be comprised of representatives from communities in the State with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income populations, or both. As with the initial Draft Scoping Plan and first update, this Draft Scoping Plan development process includes consultation with the Committee. At the April 4, 2016 public meeting, the Committee provided draft initial recommendations for the Draft Scoping Plan, and staff are continuing to meet with the Committee to discuss these recommendations. The Committee will be making formal recommendations on the policies to be considered in the Draft Scoping Plan, will continue to hold

regular public meetings, and lead local environmental justice community discussions to inform the Draft Scoping Plan. More information about the Committee and recommendations on previous and current Draft Scoping Plans is located here: <http://www.arb.ca.gov/cc/ejac/ejac.htm>

It is critical that environmental justice communities share in the benefits of the cleaner economy that California is building. Low-income customers that are enrolled in the California Alternate Rates for Energy (CARE) Program or the Family Electric Rate Assistance (FERA) Program are also eligible to receive a rebate under the California Climate Credit⁴, or a credit on residential and small business energy bills resulting from the sale of allowances received by investor-owned utilities as part of the Cap-and-Trade program.⁵ SB 1018 and other implementing legislation requires that Cap-and-Trade auction monies deposited into the Greenhouse Gas Reduction Fund (GGRF) be used to further the purposes of AB 32, while also fostering job creation by promoting in-state GHG emissions reduction projects carried out by California workers and businesses. SB 535 directs State and local agencies to make significant investments from monies deposited into the GGRF that improve California's most vulnerable communities. Specifically, SB 535 requires that a minimum of 25 percent of these investments are allocated to projects that provide benefits to disadvantaged communities, and a minimum of 10 percent are allocated to projects located within and providing benefits to disadvantaged communities. Based on agency data reported as of December 2015, 51% of the \$912 million dollars implementing California Climate Investments are funding projects that provide benefits to disadvantaged communities; 39% of the \$912 million are funding projects located within disadvantaged communities.⁶

Relying on Sound Science and Research

Sound science underpins, updates and strengthens climate policy. The scientific record overwhelmingly and undeniably demonstrates that climate change is occurring. It also connects human-related activities to the atmospheric burden of CO₂ with expansion at an unprecedented rate. As we develop this Draft Scoping Plan, time matters. The policies that are included must rapidly lead to real results to avoid the most catastrophic impacts of climate change. In the Draft Scoping Plan, we will identify policies based on solid science and identify additional research needs, while also recognizing the need for flexibility in the face of a changing climate. Sectors such as natural and working lands have very

⁴ California Public Utilities Commission. California Climate Credit: <http://www.cpuc.ca.gov/climatecredit/>

⁵ California Public Utilities Commission. CARE/FERA Programs: <http://www.cpuc.ca.gov/General.aspx?id=976?>

⁶ Excluding High Speed Rail.

complex biological systems. While we have made significant progress in understanding the role forests can play in climate change mitigation, we need to continue our work on other landscapes. Ongoing research to better understand those systems will allow for additional opportunities to set targets and identify actionable policies.

Setting the Path to 2050

While this Draft Scoping Plan will chart the path to achieving the 2030 statewide GHG target, we need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). This Draft Scoping Plan will require us to consider what policies are needed for the mid-term and long-term, knowing that some policies for the long-term must begin implementation now. At the same time, we must consider policies for 2030 that do not simply dead end in 2030, but rather can continue to help support the State's long-term climate objectives. As with all investments, whether financial or personal, the approach we take must balance risk, reward, longevity, and timing. For example, do we promote renewable gas in the transportation or electricity sectors, or is this resource best utilized for displacement of fossil natural gas in the residential and industrial sectors? For the forest sector, are we comfortable with policies that may result in some near-term carbon loss, but ultimately support more resilient and healthier forests in the longer timeframe? And, are we willing to pursue policies that we know are needed for the 2050 target, but may not significantly reduce GHG emissions in the near-term?

Intergovernmental Collaboration

Federal, state, and local action can be complementary. We have already seen Federal action through the Clean Air Act, development of the Clean Power Plan to limit GHGs from power plants, and the advancement of methane rules for oil and gas production. Regional and local governments and agencies are leaders in addressing climate change and are uniquely positioned to reduce emissions from certain sources, especially by reducing the demand for electricity, transportation fuels, and natural gas. Many local governments have already initiated efforts to reduce GHG emissions beyond those required by the State. For example, many cities and counties are improving their municipal operations by upgrading their vehicle fleets, retrofitting government buildings and streetlights, purchasing greener products, and implementing waste-reduction policies. In addition, they are adopting more sustainable codes, standards, and general plan improvements to reduce their community's footprints and emissions.

The State is striving to provide a supportive framework to advance these and other local efforts, while also recognizing the need to build on, and export, this success to other regional and local governments through California and beyond.

Local actions are critical for implementation of California's ambitious climate agenda. Local municipal code changes, zoning changes, or policy directions that apply broadly to the community within the general plan or climate action plan area 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. Local decision-making has an especially important role in achieving reductions of GHG emissions generated from transportation. 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. 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 enhance and preserve urban forests and other greenspace. Indeed, many local agencies are already implementing ambitious climate strategies. These types of local actions complement statewide measures and may be more cost effective and provide more co-benefits than relying exclusively on top-down statewide regulations to achieve the State's climate stabilization goals. The Draft Scoping Plan will explore the potential benefit of any regional or local targets to assist local agencies in their efforts to address climate change.

International efforts

California is not alone in its efforts to address climate change. The agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) aimed at keeping the global temperature rise below 2°C, is spurring action across the world. The results of this agreement will translate into worldwide action to reduce GHGs and support decarbonization across the global economy. And, it is not just action and coordination at the international and national levels that is important. Subnational governments are front and center on this issue. With the establishment of the Under 2 Memorandum of Understanding,⁷ the Governors'

⁷ Under 2 MOU website: <http://under2mou.org/>

Climate and Forests Task Force,⁸ and the Western Climate Initiative,⁹ among other partnership initiatives, subnational jurisdictions from the around the world are collaborating on how best to address climate change and are leading the way.

From its inception, AB 32 recognized the importance of California's climate leadership and engagement with other jurisdictions, and directed ARB to consult with the federal government and other nations to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and to facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. California undertook a two-pronged approach: first, we assessed our state-specific circumstances to develop measures that would apply specifically in California; and second, we simultaneously assessed which measures might lend themselves, through careful design and collaboration with other interested jurisdictions, toward linked GHG reduction programs. Under the Clean Air Act, California has a special role as an innovator and leader in the area of motor vehicle emission regulations, which allows our State to adopt motor vehicle emission standards that are stricter than federal requirements. These motor vehicle standards have been emulated around the country and the world, leading to widespread health benefits. Similarly, by enacting a comprehensive strategy that can be exported nationally and internationally, California can lead the world in truly tackling climate change.

Today, the State's Cap-and-Trade Program is linked with Québec's program; ongoing discussions to link with Ontario's emerging emissions trading system are underway. Low-carbon fuel mandates similar to California's Low Carbon Fuel Standard have been adopted by the U.S. EPA, and by other jurisdictions including Oregon, British Columbia, the European Union, and the United Kingdom. Over two dozen states have a renewable portfolio standard. California continues to discuss carbon pricing through a cap-and-trade program with international delegations. We have seen design features of our program incorporated into other emerging and existing programs, such as the European Union Emissions Trading System and China's developing national program.

Understanding the Challenge

In charting the path towards the 2030 statewide GHG target, we first need to understand the amount of GHG reductions needed between now and 2030 to

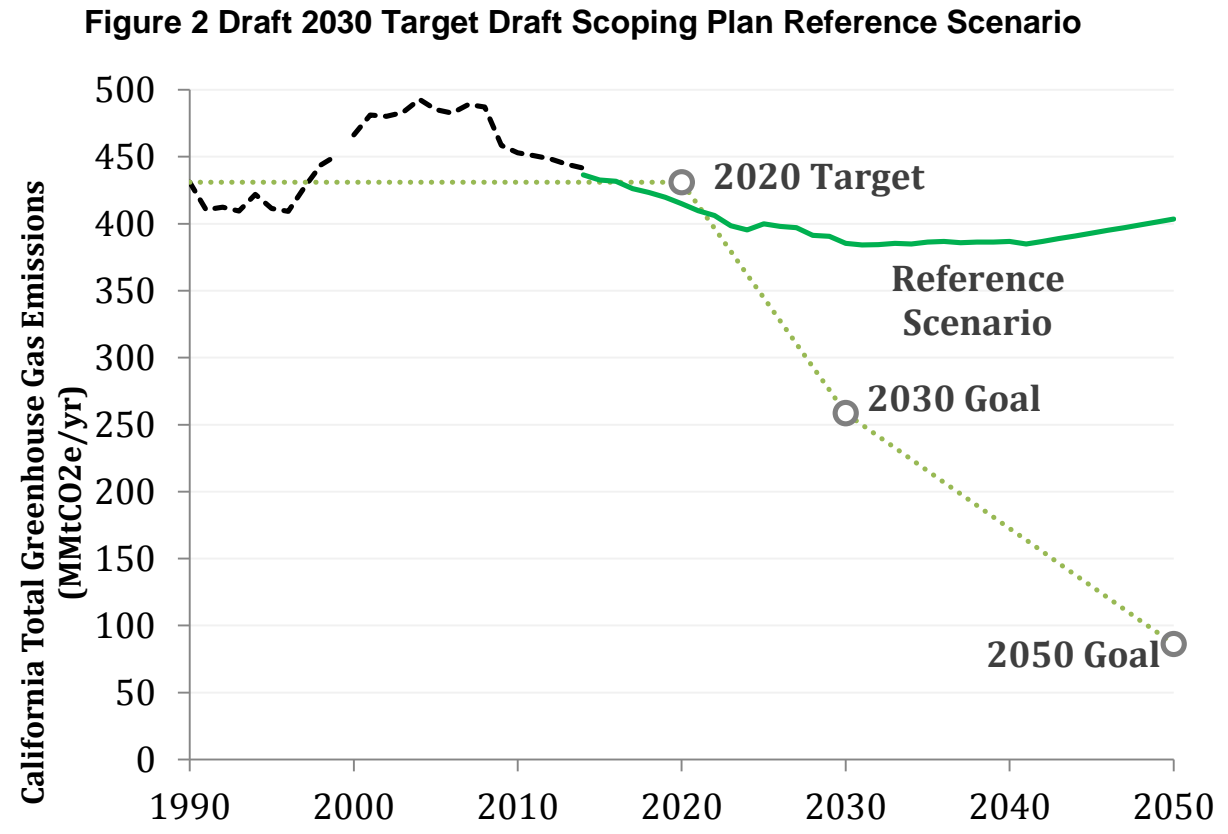
⁸ Governors' Climate and Forests Task Force website: <http://www.gcftaskforce.org/>

⁹ Western Climate Initiative website: <http://www.wci-inc.org/>

reach our target. This is best understood by first modeling a reference case (also referred to as “Business as Usual”, or BAU), which extends today’s existing actions to 2030 to depict future GHG emissions levels. The forecasted level of statewide total GHG emissions in 2030 is expected without any further action to reduce GHGs. ARB held a workshop on January 15th, 2016, to provide additional details on the models that will be used to evaluate the Draft Scoping Plan (PATHWAYS and REMI PI+) and an overview of their use. The information provided at that workshop is located here:

<http://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>

Figure 2 provides the modeling results for a draft reference scenario (BAU) for the Draft Scoping Plan. The graph shows the State is expected to reduce emissions below the 2020 statewide GHG target, but additional effort will be needed to maintain and continue GHG reductions and meet the mid (2030) and long-term (2050) targets. The draft reference scenario (BAU) includes an updated methodology for estimating biofuel supplies.



The same models will be used to conduct the analyses for the various scenarios that will be evaluated to achieve the 2030 statewide GHG target. There will be

future workshops on the modeling to consider the assumptions used for the reference case (BAU) and scenarios as they are designed. These workshops will allow economic reviewers, a core group of academic experts in economics, modeling, and technology, to present the findings of their analyses of the economic and technical assumptions, metrics, and tools proposed to be utilized. The assumptions used for the draft reference case is provided in Appendix A.

For the first time, the Draft Scoping Plan analysis will include estimates of the impact of land use both from business-as-usual approaches and proposed policies (GHG impacts and economic impacts). These estimates are not included in the draft reference case in Figure 2. State agencies are exploring how to estimate GHG emissions and sequestration trends for the natural working lands sector in the Draft Scoping Plan analysis. Although PATHWAYS does not directly calculate or model GHG emissions trends for the natural working lands sector, PATHWAYS can provide estimates regarding the amount of land conversion that would be required to achieve the State's renewable energy procurement goals related to utility-scale solar and wind and transportation targets. These estimates can be used to calculate the potential GHG emissions associated with the amount of land conversion required to build the new capacity and mobility. In doing so, the Draft Scoping Plan will identify potential trade-offs between renewable energy, land use impacts, and associated GHGs. Similarly, separate analyses will also examine the potential GHG impacts of more compact development, driven by SB 375, on the rate of land conversion for urbanization. Having the ability to quantify these types of emissions sources is important when we consider the impacts of energy and land use development policies on the natural and working lands sector.

Choosing a Path Forward

In this concept paper, we are presenting four potential high-level concepts for achieving the needed GHG reductions. Some policies are common to the scenarios if they are explicitly required in statute. For example, each scenario must include at least a 50 percent RPS because that is required under SB 350, Clean Energy and Pollution Reduction Act of 2015. To provide context for the potential high-level policy scenarios that could be evaluated in the Draft Scoping Plan, we must first understand the GHG reductions achieved by major policies, such as those included in SB 350 that can reasonably be expected across all scenarios. The information provided below is our best available data to help stakeholders consider the high-level concepts and provide input before modeling of any policies.

As no modeling work for the Draft Scoping Plan has begun, this discussion relies on previous work completed for the 2014 California State Agencies' PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios (PATHWAYS).¹⁰ This model was designed by Energy & Environmental Economics (E3) to evaluate the feasibility and cost of a range of GHG reduction scenarios in California.

Two 2014 California State Agencies' PATHWAYS Project scenarios that represent emissions reductions that could be achieved through the implementation of complementary policies through 2030 are called Straight Line and Early Deployment. None of the scenarios included California's cap and trade program. The Straight Line scenario is distinguished by high renewable energy, fuel cell and battery electric vehicles, energy efficiency and electrification. The Early Deployment scenario is similar to Straight Line scenario but with additional focus on near-term air quality and GHG actions.

Table 1 outlines the GHG emissions forecast for the 2014 California State Agencies' PATHWAYS Project two policy scenarios, which include the incremental GHG reductions achieved through complementary policies.

Table 1: 2014 California State Agencies' PATHWAYS Project Emissions MMTCO₂e Forecasts

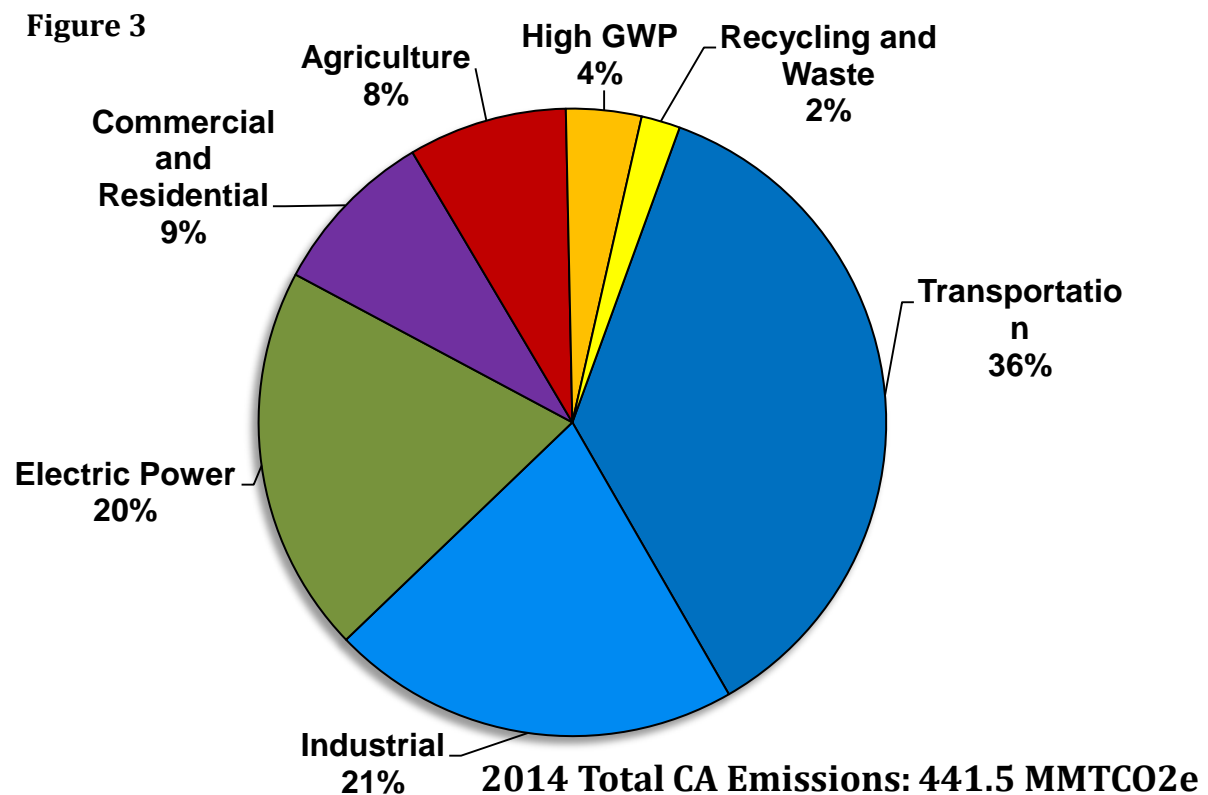
	2020	2025	2030
Straight Line	390.9	350.9	289.4
Early deployment	387.3	338.8	267.9

None of the 2014 California State Agencies' PATHWAYS Project scenarios reach the GHG target of a 40 percent reduction below 1990 levels by 2030 (i.e. 260 MMTCO₂e). Reaching this target would require a cumulative reduction of approximately 752 MMTCO₂e from 2021 through 2030. To reach the goal of 40 percent below 1990 levels, additional policies are required to provide GHG reductions of approximately 127 to 219 MMTCO₂e cumulatively from 2021 to 2030 (i.e., an additional 17 to 29 percent), conditional on the emission reductions that would be achieved through complementary policies and uncertainty related to technology development and deployment, legal challenges, and reduction

¹⁰ The state agency collaborators on the project include California Air Resources Board, the California Independent System Operator, the California Public Utilities Commission, and the California Energy Commission using the PATHWAYS model. Results are available here: https://ethree.com/public_projects/energy_principals_study.php

mandates at the national and international levels. The 2014 California State Agencies' PATHWAYS Project results can serve as a rough estimate to help evaluate the high-level policy concepts that are presented in this paper. What is clear from this work is that keeping many of the existing policies at existing stringencies, while increasing the RPS to 50% and doubling energy efficiency in existing buildings to reflect SB 350 requirements, will not be sufficient to achieve the 2030 target.

It is also important to understand the sources of emissions when considering opportunities for policies and programs to reduce GHGs. Figure 3 provides the percent contribution to statewide emissions from the main economic sectors as reflected in the 2014 GHG Emission Inventory (2016 Edition).¹¹



Climate change mitigation policies must be considered in the context of the sector's contribution to the State's total GHGs. The transportation, electricity (in-state and imported), and industrial sectors are the largest sectors for GHGs in the inventory and present the largest opportunities for GHG reductions. However, to ensure decarbonization across the entire economy, policies must be

¹¹ Based on 100-year global warming potentials (GWP) and the IPCC Fourth Assessment Report (FAR).

considered for all sectors. Policies that support energy efficiency, alternative fuels, and renewable power can also provide co-benefits for criteria and air toxic pollutants.

Any specific policies identified within the Draft Scoping Plan will be subject to a subsequent analytical and public process to develop and identify the full requirements and process for implementation. For example, a change in the Low Carbon Fuel Standard Carbon Intensity target would take effect after a subsequent rulemaking for that regulation that would include its own public process, CEQA, economic, and public health analyses. Stakeholders should also be aware that many large policies for reducing emissions towards the 2030 target are already known. For example, the increased RPS and energy efficiency requirements and various transportation plans will go far in reducing GHGs towards achieving the 2030 target. The challenge before us is to identify what additional policies or program enhancements we need to achieve the remaining amount of GHG reductions in a complementary, flexible, and cost effective manner to achieve the 2030 target. These policies should continue to encourage reductions beyond 2030 to keep us on track to stabilize climate. Policies that ensure economy-wide investment decisions incorporate consideration of GHG emissions are particularly important.

At the same time, we must acknowledge the integrated nature of our built and natural environments and policies. In the Draft Scoping Plan, each of the policies directed at the built environment must be considered against the high level goals for the natural working lands sector. While emissions from the agriculture and natural lands sector are lower, policies that support these sectors can reduce emissions and sequester carbon, while also providing ecosystem benefits such as better water quality, increased water yield, soil health, reduced erosion and habitat connectivity. These policies and co-benefits will be considered as part of the integrated strategy outlined above.

The four concepts below illustrate how many of the policies that will be included in any preferred path to achieving the 2030 target are already known. Some of the concepts do allow for modifying those existing or draft policies to address GHG emissions from a specific sector. Stakeholders are encouraged to provide comments on the high level concepts presented or alternative concepts, while keeping in mind that some of these are statutory requirements or existing and draft plans that have been under development for a while with a public process.

Concept 1: Complementary Policies with a Cap-and-Trade Program

Concept 1 would include enhancements to existing programs and implementation of SB 350. This concept builds on the successful programs that have put California on the path for reaching the 2020 GHG Statewide limit mandated by AB 32. This concept also continues California's strategy to rely on a package of complementary measures to achieve its GHG reduction goals as well several co-benefits including reduction of other pollutants that adversely impact public health particularly in disadvantaged communities where levels are frequently elevated. The major policies in this scenario would include the following 2030 goals:

- SB 350 – by 2030
 - 50 percent RPS
 - Doubling of energy efficiency of existing buildings
- Increase in Low Carbon Fuel Standard – by 2030
 - Carbon Intensity reduction: > 10%
- Mobile Source Strategy
 - 1.5 million zero emission and plug-in hybrid light duty electric vehicles by 2025
 - Medium and Heavy-Duty GHG Phase 2
 - Advanced Clean Transit: Up to 20 percent of new urban buses purchased beginning in 2018 will be zero-emission buses, ramping up to 100 percent of new sales in 2030.
 - Last Mile Delivery: Phase-in of zero-emission trucks for class 3-7 last mile delivery trucks starting in 2020. Zero-emission vehicles comprise 2.5 percent of new Class 3-7 trucks sales in local fleets starting 2020, increasing to 10 percent in 2025 and remaining flat through 2030.
- Implementation of currently proposed Short Lived Climate Pollutant Strategy – by 2030
 - 40% reduction in methane and hydrofluorocarbon emissions
 - 50% reduction in black carbon emissions
- Increased stringency of SB 375 Sustainable Communities Strategy – 2035 targets
- Draft California Sustainable Freight Action Plan
 - Deploy 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.

- Cap-and-Trade Program with a 4 percent annual cap decline
- Natural and Working Lands – by 2030
 - Each year, 500,000 acres of nonfederal forest lands included in restoration plans oriented towards forest health and carbon storage
 - More infill and revitalization of urban core areas
 - Land preservation policies
 - Increase habitat acreage protected or restored

Concept 1 largely builds on California’s success with existing programs to include enhancements to those programs combined with the new SB 350 requirements. The Low Carbon Fuel Standard would build on the current CI reduction of 10 percent in 2020 requiring further reductions in the CI through 2030. The comprehensive strategies for Sustainable Freight, Mobile Source, and California Transportation Plan 2040 that are recently developed or in the process of being finalized would be implemented to maximize benefits for criteria and air toxics and GHG reductions. This scenario would include increased stringency of SB 375 Sustainable Communities Strategy 2035 targets. To ensure that the State meets the 40% GHG reduction target, Concept 1 would include a Cap-and-Trade Program with declining caps to provide compliance flexibility for the regulated entities, access and incentive to identify the lowest cost GHG emission reduction opportunities across the economy.

This would also provide continued support for collaborative action through linkages with other programs, such as Québec’s Cap-and-Trade System and a recently established Ontario Cap-and-Trade Program. We could also use the extended Cap-and-Trade Program for demonstrating compliance with the Clean Power Plan (CPP) without the need to make other programs, such as the RPS, subject to Federal jurisdiction. The Cap-and-Trade Program could also potentially be linked with other states that chose to pursue a trading program to comply with CPP. Importantly, as other sectors are identified for GHG emissions regulation at the federal level, the Cap-and-Trade Program can readily accommodate that expansion.

As Concept 1 includes the Cap-and-Trade Program with quarterly auctions of allowances, funds would also continue to be deposited into the GGRF. Currently, the Legislature and Governor appropriate proceeds from the sale of State-owned allowances for projects that support the goals of AB 32. Strategic investment of these proceeds furthers the goals of AB 32 by reducing GHG emissions, providing net GHG sequestration, providing co-benefits, and supporting the long-term, transformative efforts needed to improve public and

environmental health and develop a clean energy economy. These investments support programs and projects that also deliver major economic, environmental, and public health benefits for Californians, including meaningful benefits to the most disadvantaged communities. Investments are providing a multitude of benefits to disadvantaged communities including increased affordable housing opportunities, reduced transit and transportation costs, access to cleaner vehicles, improved mobility options and air quality, job creation, energy and water savings, and greener and more vibrant communities.

Concept 2: Ambitious Complementary Policies without Cap-and-Trade; a Focus on Industrial Sources

Concept 2 would include some additional enhancement of existing policies, implementation of SB 350, and industrial facility caps to specifically address the industrial sector. The major policies in this scenario would include the following goals:

- SB 350 – by 2030
 - 50 percent RPS
 - Doubling of energy efficiency of existing buildings
- Increase in Low Carbon Fuel Standard – by 2030
 - Carbon Intensity reduction: > 10%
- Mobile Source Strategy
 - 1.5 million zero emission and plug-in hybrid light duty electric vehicles by 2025.
 - Medium and Heavy-Duty GHG Phase 2
 - Advanced Clean Transit: Up to 20 percent of new urban buses purchased beginning in 2018 will be zero-emission buses, ramping up to 100 percent of new sales in 2030.
 - Last Mile Delivery: Phase-in of zero-emission trucks for class 3-7 last mile delivery trucks starting in 2020. Zero-emission vehicles comprise 2.5 percent of new Class 3-7 trucks sales in local fleets starting 2020, increasing to 10 percent in 2025 and remaining flat through 2030.
- Enhanced implementation of currently proposed Short Lived Climate Pollutant Strategy – by 2030
 - > 40% reduction in methane and hydrofluorocarbon emissions
 - > 50 % reduction in black carbon emissions
- More ambitious targets of SB 375 Sustainable Communities Strategy – 2035 targets

- Draft California Sustainable Freight Action Plan
 - Deploy 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.
- Entity level GHG declining caps for industrial sources
- Natural and Working Lands – by 2030
 - Each year to 2030, 500,000 acres of nonfederal forest lands included in restoration plans oriented towards forest health and carbon storage
 - More infill and revitalization of urban core areas
 - Land preservation policies
 - Increase habitat acreage protected or restored

Concept 2 does not include a Cap-and-Trade Regulation post-2020 and thus would also require more ambitious targets for the Short Lived Climate Pollutant Strategy and more ambitious 2035 targets for SB 375 than in Concept 1. Because this scenario would not include a statewide limit on GHG emissions, continuous program adjustments may be necessary to ultimately achieve the 2030 target. Under Concept 2, there would be requirements on the industrial entities currently regulated by the Cap-and-Trade Program to each reduce their GHG emissions at a rate to be determined once there has been an evaluation of how many additional reductions are still needed after the other policies are implemented. The industrial facility caps would not decline at a rate greater than 4 percent each year. The industrial facility caps would be established by identifying a baseline annual GHG emissions level for each regulated entity in permits, and requiring a decrease in emissions to achieve the required GHG reductions. If the modeling demonstrates the 2030 target is still not achieved, other policies such as the Low Carbon Fuel Standard may need to be made more stringent.

Concept 2 would not include any type of compliance instruments or trading as is included in the Cap-and-Trade Program. The linked cap-and-trade program between California and Québec would no longer exist. We would also forgo future linkages with other programs. The State would also need to identify another program, such as facility caps, as the compliance demonstration mechanism for the CPP. And, as the federal GHG regulations are expanded to cover additional sectors, we would need to take a sector-by-sector approach to address compliance under a federal scheme.

Concept 3: Ambitious Complementary Policies without Cap-and-Trade; a Focus on Transportation

Concept 3 does not include a Cap-and-Trade Regulation post-2020 and thus would require additional focus on reducing GHG emissions from the transportation sector. The major policies in this scenario would include the following goals:

- SB 350 – by 2030
 - 50 percent RPS
 - Doubling of energy efficiency of existing buildings
- Increase in Low Carbon Fuel Standard – by 2030
 - Carbon Intensity reduction: >10%
- Mobile Source Strategy
 - 3.5-4.5 million zero emission and plug-in hybrid light duty electric vehicles by 2030
 - Medium and Heavy-Duty GHG Phase 2
 - Advanced Clean Transit: Up to 20 percent of new urban buses purchased beginning in 2018 will be zero-emission buses, ramping up to 100 percent of new sales in 2030.
 - Last Mile Delivery: Phase-in of zero-emission trucks for class 3-7 last mile delivery trucks starting in 2020. Zero-emission vehicles comprise 2.5 percent of new Class 3-7 trucks sales in local fleets starting 2020, increasing to 10 percent in 2025 and remaining flat through 2030.
- Implementation of currently proposed Short Lived Climate Pollutant Strategy – by 2030
 - 40% reduction in methane and hydrofluorocarbon emissions
 - 50% reduction in black carbon emissions
- Require industrial entities to evaluate and identify cost-effective and technically feasible improvements, develop individual rules on source types of emissions and require improvements during scheduled maintenance, or other schedule, at the industrial facility
- Ambitious stringency of SB 375 Sustainable Communities Strategy – 2035 targets
- Draft California Sustainable Freight Action Plan
 - Deploy 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.
- Natural and Working Lands – by 2030

- Each year, 500,000 acres of nonfederal forest lands included in restoration plans oriented towards forest health and carbon storage
- More infill and revitalization of urban core areas
- Ambitious land preservation policies
- Increase habitat acreage protected or restored

Concept 3 would include more ambitious targets for the Low Carbon Fuel Standard and increased percentage of zero emission vehicles than in Concept 1. Because this scenario would not include a statewide limit on GHG emissions, continuous program adjustments may be necessary to ultimately achieve the 2030 target. As this strategy would focus on transportation and fuels, staff would explore additional measures to promote technology with GHG emissions reductions from heavy-duty vehicles, public transit systems, and freight. Industrial sector GHG emissions would be addressed through the traditional regulatory approach for addressing criteria pollutants at stationary sources. Land-use and planning would also include additional measures to reduce VMT by identifying more ambitious targets for SB 375 than in Concepts 1 and 2. Enhanced goals for the natural working lands sector for land preservation would support reduced new development and reduced VMT.

Concept 3 would not include any type of compliance instruments or trading as is included in the Cap-and-Trade Program. The existing linked cap-and-trade program between California and Québec would no longer exist. We would forgo future linkages of this type with other programs, such as the recently adopted Ontario Cap-and-Trade Program. The State would also need to identify another program, such as the RPS or use the facility level caps, as the compliance demonstration mechanism for the Clean Power Plan. And, as the federal GHG regulations are expanded to cover additional sectors, we would need to take a sector-by-sector approach to address compliance under a federal scheme.

Concept 4: Complementary Policies with a Carbon Tax

Concept 4 would include the same enhancements to existing programs as in Concept 1, but in lieu of a Cap-and-Trade Program, this scenario includes a carbon tax. The major policies in Concept 4 would include the following goals:

- SB 350 – by 2030
 - 50 percent RPS
 - Doubling of energy efficiency of existing buildings
- Increase in Low Carbon Fuel Standard – by 2030

- Carbon Intensity reduction: > 10%
- Mobile Source Strategy
 - 1.5 million zero emission and plug-in hybrid light duty electric vehicles by 2025
 - Medium and Heavy-Duty GHG Phase 2
 - Advanced Clean Transit: Up to 20 percent of new urban buses purchased beginning in 2018 will be zero-emission buses, ramping up to 100 percent of new sales in 2030.
 - Last Mile Delivery: Phase-in of zero-emission trucks for class 3-7 last mile delivery trucks starting in 2020. Zero-emission vehicles comprise 2.5 percent of new Class 3-7 trucks sales in local fleets starting 2020, increasing to 10 percent in 2025 and remaining flat through 2030.
- Implementation of currently proposed Short Lived Climate Pollutant Strategy – by 2030
 - 40% reduction in methane and hydrofluorocarbon emissions
 - 50% reduction in black carbon emissions
- Increased stringency of SB 375 Sustainable Communities Strategy – 2035 targets
- Draft California Sustainable Freight Action Plan
 - Deploy 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.
- Natural and Working Lands – by 2030
 - Each year, 500,000 acres of nonfederal forest lands included in restoration plans oriented towards forest health and carbon storage
 - More infill and revitalization of urban core areas
 - Land preservation policies
 - Increase habitat acreage protected or restored
- Carbon tax applied at a value predetermined by a method such as economic modeling or the use of the US EPA social cost of carbon

Concept 4 would require additional legislative authority, as it is a tax. Other GHG reductions policies can be implemented under existing authority. A potential carbon tax could be set at the same point of regulation for the entities that are currently subject to the California Cap-and-Trade Program, or farther upstream. Because this scenario would not include a statewide limit on GHG emissions, it is unknown if any given level carbon tax would ultimately achieve the 2030 target. This scenario includes a fixed cost for each metric ton of carbon dioxide equivalent, which could be priced at a value predetermined by a method such as economic modeling or the use of the US EPA social cost of carbon, which has a

range of \$11 to \$105 in 2015. At this time, it is not known how monies generated by a carbon tax would be used. Although some types of GGRF programs could continue to be funded, if a carbon tax is passed by a 2/3 vote, it would give the legislature and Governor more flexibility on ways to use the funds.

Under Concept 4, the linked cap-and-trade program between California and Québec would no longer exist. We would forgo future linkages of this type with other programs, such as the Ontario program and a federal trading system for the CPP. The State would need to identify another program, such as the RPS, as the compliance demonstration mechanism for the Clean Power Plan. And, as the federal GHG regulations are expanded to cover additional sectors, we would need to take a sector-by-sector approach to address compliance under a federal scheme.

Next Steps and Submittal of Public Comments

As part of the continuing public input process, ARB staff will provide a Draft Scoping Plan update at the June 23rd Board hearing, which will include the opportunity for public comment. This summer and fall, the agencies will hold public workshops to solicit comments on modeling efforts and scenarios for achieving the 2030 target. Once the scenarios are fully developed in late summer, we will provide a Draft Scoping Plan with CEQA and economic analyses for public review and comment.

The first Board hearing on the Draft Scoping Plan is planned for November 2016 with a second Board hearing in March 2017. The Environmental Advisory Justice Committee is also planning a series of local community meetings plus additional full Committee meetings throughout the State starting in summer 2016.

This paper provides the overall framing for this Draft Scoping Plan and lays out the challenge and potential solutions to achieving our 2030 statewide GHG target. For this paper, stakeholders are encouraged to provide written comments during an informal comment period which will conclude at 5:00 p.m. Pacific time on Friday, July 8, 2016. Comments can be submitted here:

<http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

APPENDIX A

2030 Target Scoping Plan Concept Paper

Draft Reference Scenario Assumptions for PATHWAYS Model

DRAFT REFERENCE SCENARIO MAJOR POLICY ASSUMPTIONS
<i>Utility Electricity - Supply Side</i>
<p>Renewable Portfolio Standard (RPS) - SB 1x-2: Achieve 33% by 2020 and maintain at 33% through 2050. Renewable generation technologies represented using the California Public Utilities Commission (CPUC) RPS Calculator (2016)</p> <p>SB 1368: Existing coal generation contracts expire and are not renewed</p> <p>Phase out of Once Through Cooling capacity as planned</p> <p>Increased Combined Heat and Power (CHP) to achieve the Governor's target as described in the CPUC Long-Term Procurement Plan (LTPP, February 2016)</p> <p>Energy storage requirements (CPUC) achieved and then maintained through 2050</p> <p>Diablo Canyon retired in 2025</p>
<i>Buildings</i>
<p>The Integrated Energy Policy Report (IEPR, 2015) California Energy Demand Forecast is used as a benchmark through 2026, which incorporates:</p> <p><i>Additional Achievable Energy Efficiency</i></p> <p><i>Continued Cap-and-Trade Program cap maintained at the 2020 level</i></p> <p><i>Customer Side Solar, including the Governor's Distributed Generation (DG) goal</i></p> <p><i>Building Energy Efficiency Standards (AB 1109, AB 1470)</i></p> <p><i>Green State Buildings Executive Order</i></p> <p><i>Energy Savings Assistance Program</i></p> <p><i>Weatherization Assistance Program</i></p>
<i>Transportation</i>
<p>The Mobile Source Strategy (May 2016) Current Control Programs scenario is used, which is based on CARB Vision Scenario Planning analyses (Version 2.1). The Vision analyses incorporate:</p> <p><i>AB1493 Clean Car Standards</i></p> <p><i>Advanced Clean Cars</i></p> <p><i>Zero Emissions Vehicle (ZEV) Action Plan (EO B-16-2012)</i></p> <p><i>Maritime: Ocean/Harbor Regulation</i></p> <p><i>High Speed Rail (SP T-9)</i></p> <p><i>SB99 Active Transport</i></p> <p><i>SB375 Sustainable Communities (current plans)</i></p> <p><i>Affordable housing and sustainable communities program</i></p> <p><i>Heavy Duty Vehicle (HDV) Efficiency Standards (EPA/NHTSA and SP T-8)</i></p>

DRAFT REFERENCE SCENARIO MAJOR POLICY ASSUMPTIONS
<i>Fuels</i>
Low Carbon Fuel Standard (LCFS) achieves 10% reduction in fuel carbon intensity (CI) by 2020 (relying in part on banked credits) and maintains the 10% thereafter. The LCFS analysis incorporates the continuation of the Federal Renewable Fuel Standard and the Cap-and-Trade Program cap maintained at the 2020 level. (The Federal Biodiesel Blenders Tax Credit is assumed to end after 2016.)
<i>Industry and Agriculture Energy Demand</i>
The Integrated Energy Policy Report (IEPR, 2015) California Energy Demand Forecast is used as a benchmark through 2026, which incorporates: <i>Additional Achievable Energy Efficiency</i> <i>Continued Cap-and-Trade Program cap maintained at the 2020 level</i>
<i>Non-energy, non-CO₂ Greenhouse Gases</i>
The Proposed Short Lived Climate Pollutant Strategy (April 2016) is used, reflecting emissions estimates with existing measures.