Building Decarbonization Workshop

2022 Scoping Plan Update
2022 State Strategy for the State Implementation Plan
California Green Building Standards (CALGreen) Code

DECEMBER 13, 2021
Transparency on Oral Comment Process

• Dedicated time for EJ Advisory Committee Members after the conclusion of presentations

• During general comment period:
  • CARB staff will periodically announce approximate number of hands raised
  • No ceding of time to others
  • Any EJ Advisory Committee Members should use the dedicated time after presentations to make any comments to ensure they are heard
  • Please do not email us directly to ask that we give you priority
Public Participation: Overview

- Panel Presentations/Discussion
- Dedicated time for EJ Advisory Committee Members
- Questions and Feedback
  - Use the “Raise Hand” function in the GoToWebinar toolbar, which should be located to the right of your screen as shown
  - When staff call your name, please “Unmute” yourself by clicking the red button, and proceed to introduce yourself
  - If you have technical difficulties, please email: stcdvision@arb.ca.gov
- Written comments can be submitted using the following link:
- Comment closing date January 7, 2022 (11:59 pm)
Introduction

Jennifer Gress, Chief
Sustainable Transportation and Communities Division
Today’s Workshop Objectives

• Hear updates on building decarbonization efforts underway

• Discuss benefits, challenges, opportunities, market readiness, environmental justice considerations, and potential paths ahead

• Receive feedback on key questions to inform development of:
  1. 2022 Scoping Plan Update
  2. 2022 State SIP Strategy
Workshop Agenda

1. Panel 1: Building Decarbonization Efforts and Important Considerations
2. Panel 2: Consumer Costs and Market Trends
3. Panel 3: Opportunities to Advance Building Decarbonization

Panel 1 – Introduction to Presenters

Dana Papke Waters,
Staff Air Pollution Specialist
Sustainable Transportation and Communities Division
CARB

Michael Sokol,
Deputy Director
Efficiency Division
California Energy Commission

Rory Cox,
Senior Analyst
Energy Division
California Public Utilities Commission

Denise Grab,
Manager
Carbon-Free Buildings
RMI
CARB’s Building Decarbonization Efforts
CARB Building Decarbonization Efforts Underway

1. 2022 Scoping Plan Update
2. 2022 State SIP Strategy

Image Source: iStock Photo
Science-based Target: Achieve Carbon Neutrality (CO$_2$e) Mid-Century

Sources equal Sinks

- Continue to reduce emissions from sources in AB 32 GHG Inventory
- Reduce emissions and increase sequestration in Natural and Working Lands
- Maximize all sinks with goal of achieving net negative
Umbrella of Building Decarbonization Strategies
Focus Today – Building Electrification

Image Source: CARB Staff

Concepts for Seven Broad Building Decarbonization Strategies
Why is Building Electrification Important?

- **Climate**
  - Reduces: Each home electrified today
  - 30-60% GHG Emission Reductions

- **Air Quality**
  - Achieves: NO\textsubscript{x} Emission Reductions
  - Cleaner Air and Healthier Buildings

- **Health**
  - Benefits: If all homes electrified today
  - Saves hundreds of lives and $3.5B annually

*Image Source: iStock Photo*

*Sources: Mahone et al., 2019; Frontier Energy, 2019; Zhu et al., 2020*
Building Electrification Reduces Indoor & Outdoor Health Risks

- Meta-analysis of over 40 studies over 20 years demonstrates indoor health risks:
  - 42% increased risk of current asthma (and 24% increased risk of lifetime asthma) for children living in a house with gas stove cooking.

- 12 million Californians in homes with natural gas stoves routinely exposed to NO$_2$ levels > 1-hr NAAQS

- 100% electrification of residential and commercial buildings in California will reduce deaths and illnesses from emissions vented to indoor and outdoor air

Sources: Lin et al., 2013; Seals and Krasner, 2020; Logue et al., 2014
Technical Feasibility and Market Readiness
Building Decarbonization

- Majority of households rely on natural gas for space and water heating and cooking
- Heat pumps for space and water heating are widely available and more efficient than natural-gas counterparts
- For cooking, off-the-shelf equipment is available
- For clothes drying, heat pumps are technically ready, but combo washer/dryers are uncommon in the U.S.

Sources: DNV GL Energy Insights, 2021; Miller & Higgins, 2021
Important Considerations
Building Decarbonization

- Support achievement of climate targets
- Result in improved indoor and outdoor air quality and improved health
- Develop solutions to ensure that frontline communities benefit equitably
  - Prioritize targeted investments
  - Ensure affordable energy rates
  - Establish a just workforce transition
- Focus efforts on both new and existing buildings
- Help build market support through aligning incentive programs, broader investments, and other policies

Image Source: iStock Photo
2022 Scoping Plan Update
2022 Scoping Plan Update
Building Decarbonization

Overall Goals:

- Articulate goal to reduce building emissions based on Scoping Plan scenario analysis
- Summarize benefits, technological feasibility, and market assessment
- Lay out potential paths ahead

Incentives
Market Support
Government Partnerships
Regulations
2022 State SIP Strategy
2022 State SIP Strategy
Emission Standard for Space and Water Heaters

- Concept: Zero NOx and carbon limit that would apply to sales of all new space and water heaters beginning in 2030

- Potential measure shared in fall 2021 discussion document for 2022 State SIP Strategy and is still being evaluated

- Potential emission benefits:
  - If adopted, may reduce building emissions by ~40%
  - May reduce total statewide NOx by ~3% by 2037

- Seeking input on this concept

2019 NOx emissions (65 tons/day)

Source: NOx emissions from CEPAM: California 2019 - Version 1.02.

CALGreen Code
Green Building Standards (CALGreen) Code
New Construction

- CARB is Subject Matter Expert (SME)
  - Working with HCD, BSC, and CEC to recommend code changes

- CALGreen Code
  - Zero carbon new construction
  - Residential cooking is a high priority to protect public health

- Evaluating full range of challenges and opportunities to recommend

- Seeking input on voluntary versus mandatory standards as well as building types and end uses

Image Source: iStock Photo
Thank you
Environmental Justice Advisory Committee Member Comments
Public Participation: Panel 1

• Panel 1: Public Comments
• Questions and Feedback
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• Written comments can be submitted using the following link: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/scoping-plan-meetings-workshops
• Comment closing date January 7, 2022 (11:59 pm)
Break

WORKSHOP WILL RESUME AT 11:00 AM
Panel 2 – Consumer Costs and Market Trends

Introduction to Panelists

Moderator, Sam Lerman
Engineer
Sustainable Transportation and Communities Division
CARB

Josh Greene
Vice President
Government and Industry Affairs
A.O. Smith

Nick Janusch, PhD
Environmental and Behavior Economist
Demand Analysis Office
California Energy Commission

Pierre Delforge
Senior Scientist
Building Decarbonization
Natural Resources Defense Council

Martha Dina Argüello
Executive Director
Physicians for Social Responsibility Los Angeles
Panel 2: Consumer Costs and Market Trends

Key Topics and Questions:

- **Affordability**: How would building electrification or zero-carbon requirements impact priority populations?
- **Readiness**: What is ready to be electrified in the near-term?
- **Existing buildings**: What are barriers to electrification or zero-carbon requirements?
- **Market Development**: How can policymakers best support development of affordable technologies, workforce training, and consumer awareness?
Public Participation: Panel 2

• Panel 2: Public Comments
• Questions and Feedback
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Lunch Break

Workshop will resume at 1:00 PM
Panel 3 – Opportunities to Advance Building Decarbonization

Introduction to Panelists

Moderator, Melanie Zauscher, PhD
Manager, Sustainable Transportation and Communities Division, CARB

Abby Young, Manager, Climate Protection Program, Bay Area Air Quality Management District

Bob Raymer, PE, Owner, California Code Consultants, LLC

Carmelita Miller, Senior Director, Climate Equity, Greenlining Institute

Lauren Cullum, Policy Advocate, Sierra Club
Panel 3: Opportunities to Advance Building Decarbonization

Key Topics and Questions:

- **Investments and Incentives**: How should California approach these to further equitable building decarbonization?

- **New building standards - CALGreen**: Should this intervening code cycle include mandatory and/or voluntary zero-carbon requirements?

- **Draft Measure State SIP Strategy**: How should CARB approach a zero-carbon emission standard for space and water heaters?
Public Participation: Panel 3

• Panel 3: Public Comments
• Questions and Feedback
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General Public Comments

1. What building end uses and building types should be prioritized for building decarbonization through electrification efforts?

2. Are there model policies from other jurisdictions or specific policies that should be prioritized as California considers a path forward to equitable building electrification?

3. What complementary policies are the most important to advance in the near-term and how should they be prioritized?
Closing Remarks and Next Steps
Closing – Staying Engaged

Written comments

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Additional resources

• CALGreen Code: [https://www.dgs.ca.gov/BSC/CALGreen](https://www.dgs.ca.gov/BSC/CALGreen)
• Building Decarbonization Listserv: [https://public.govdelivery.com/accounts/CARB/subscriber/topics](https://public.govdelivery.com/accounts/CARB/subscriber/topics)