

# Building Decarbonization Workshop

2022 Scoping Plan Update

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

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DECEMBER 13, 2021



# Transparency on Oral Comment Process

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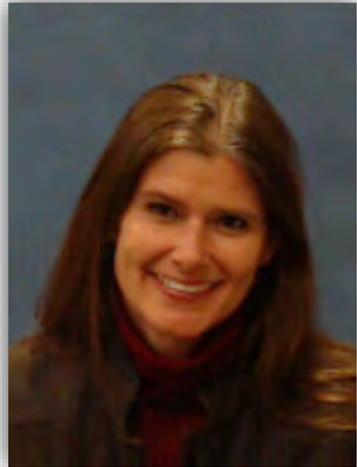
- Dedicated time for EJ Advisory Committee Members after the conclusion of presentations
- During general comment period:
  - CARB staff will periodically announce approximate number of hands raised
  - No ceding of time to others
  - Any EJ Advisory Committee Members should use the dedicated time after 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
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- Comment closing date January 7, 2022 (11:59 pm)



# Introduction



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Jennifer Gress, Chief

Sustainable Transportation and Communities Division

# Today's Workshop Objectives

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- 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
  3. California Green Building Standards (CALGreen) Code

# Workshop Agenda

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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



**Image Source:** Low Income Housing Authority (2017), "Billions in New Funding to Create More Low Income Housing in California," Retrieved from: <https://www.lowincome.org/2017/09/billions-new-funding-create-more-low-income-housing-california.html>

# Panel 1 – Introduction to Presenters

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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

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# CARB Building Decarbonization Efforts Underway

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1. 2022 Scoping Plan Update
2. 2022 State SIP Strategy
3. California Green Building Standards (CALGreen) Code

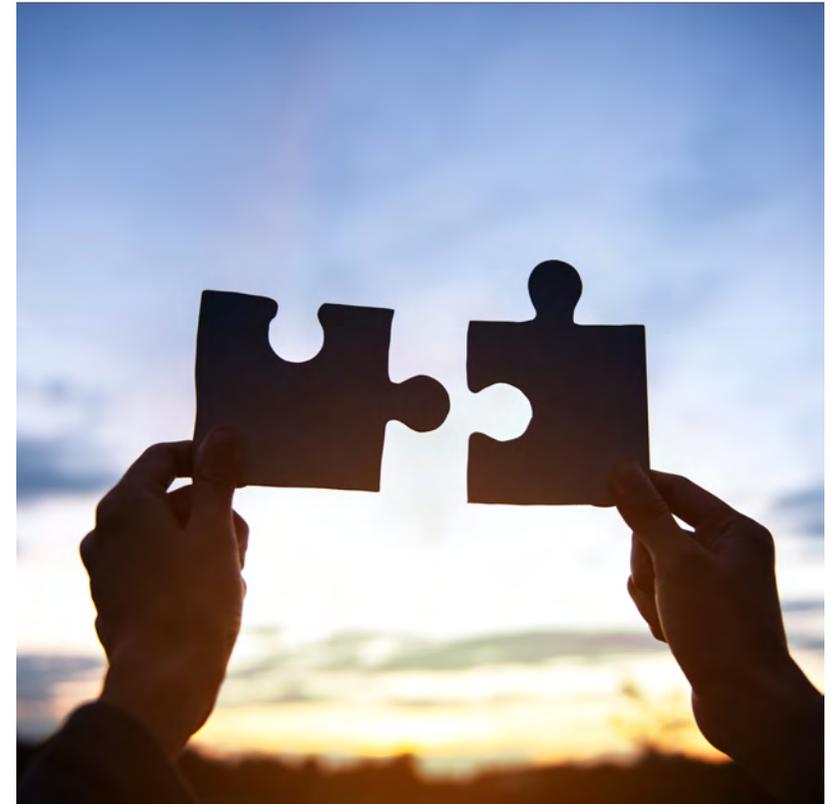
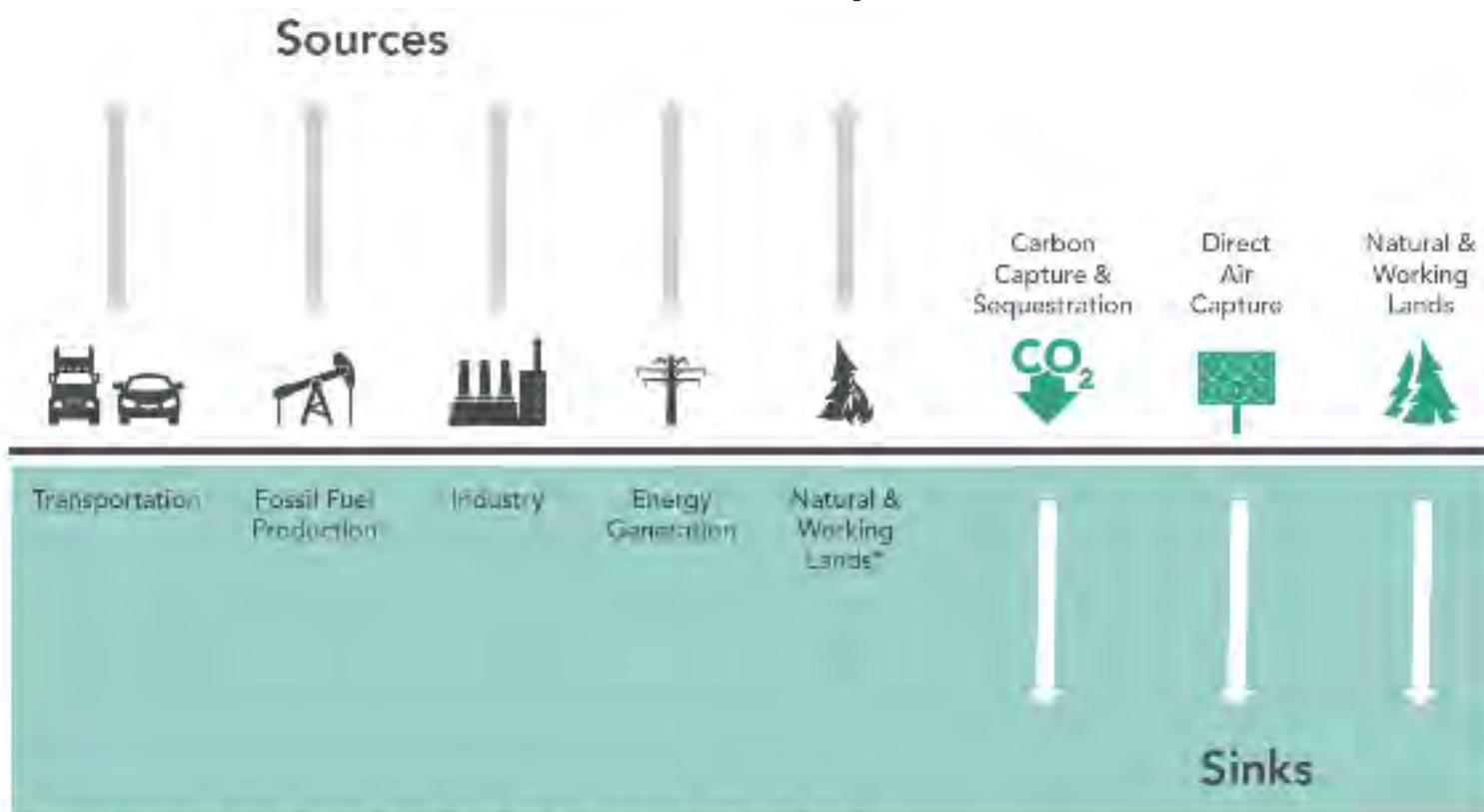


Image Source: iStock Photo

# Science-based Target: Achieve Carbon Neutrality (CO<sub>2</sub>e) Mid-Century

## Sources equal Sinks



\*Natural and working land emissions come from wildfires, disease, land and log management practices, and others.

- 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

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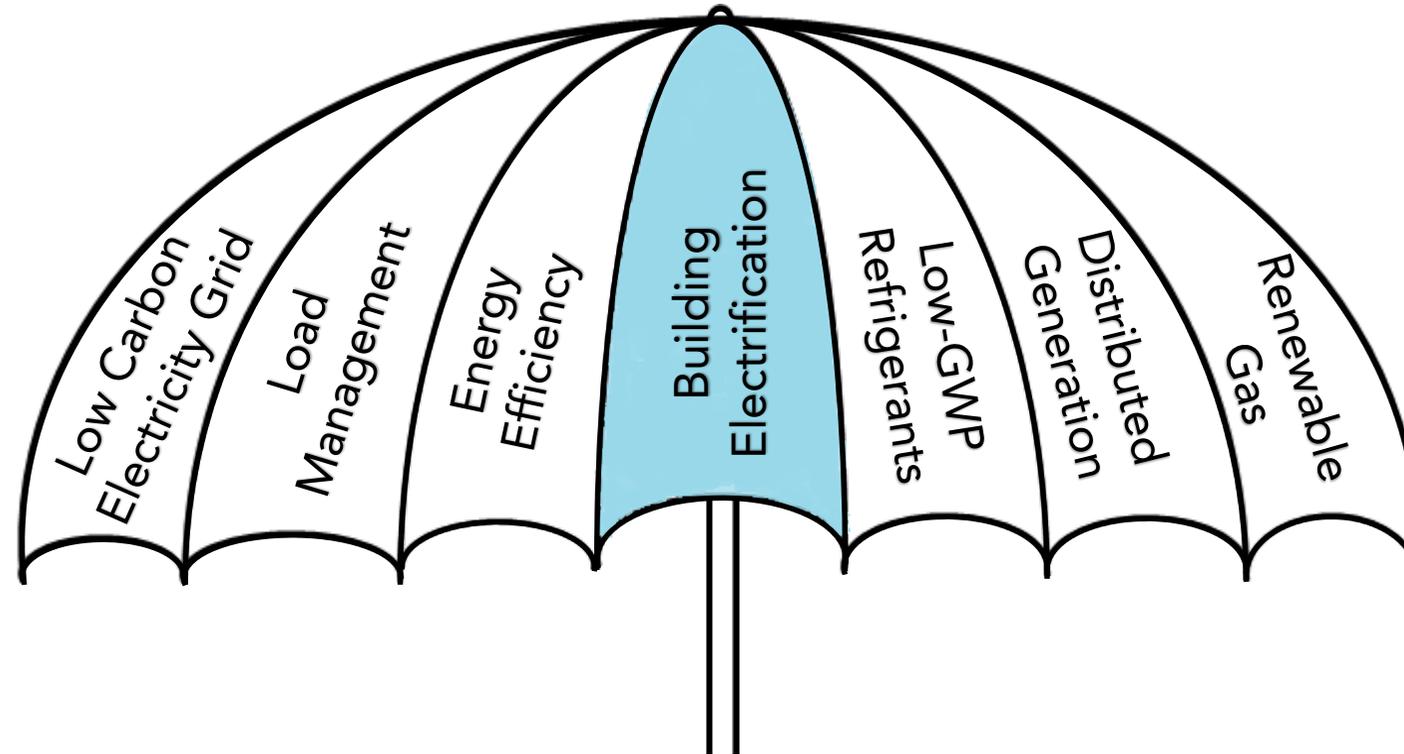


Image Source: CARB Staff

Concepts for Seven Broad Building Decarbonization Strategies

- **Source:** Kenney, Michael, Nicholas Janusch, Ingrid Neumann, and Mike Jaske. 2021. *California Building Decarbonization Assessment*. California Energy Commission. Publication Number: CEC-400-2021-006-CMF.

# Why is Building Electrification Important?

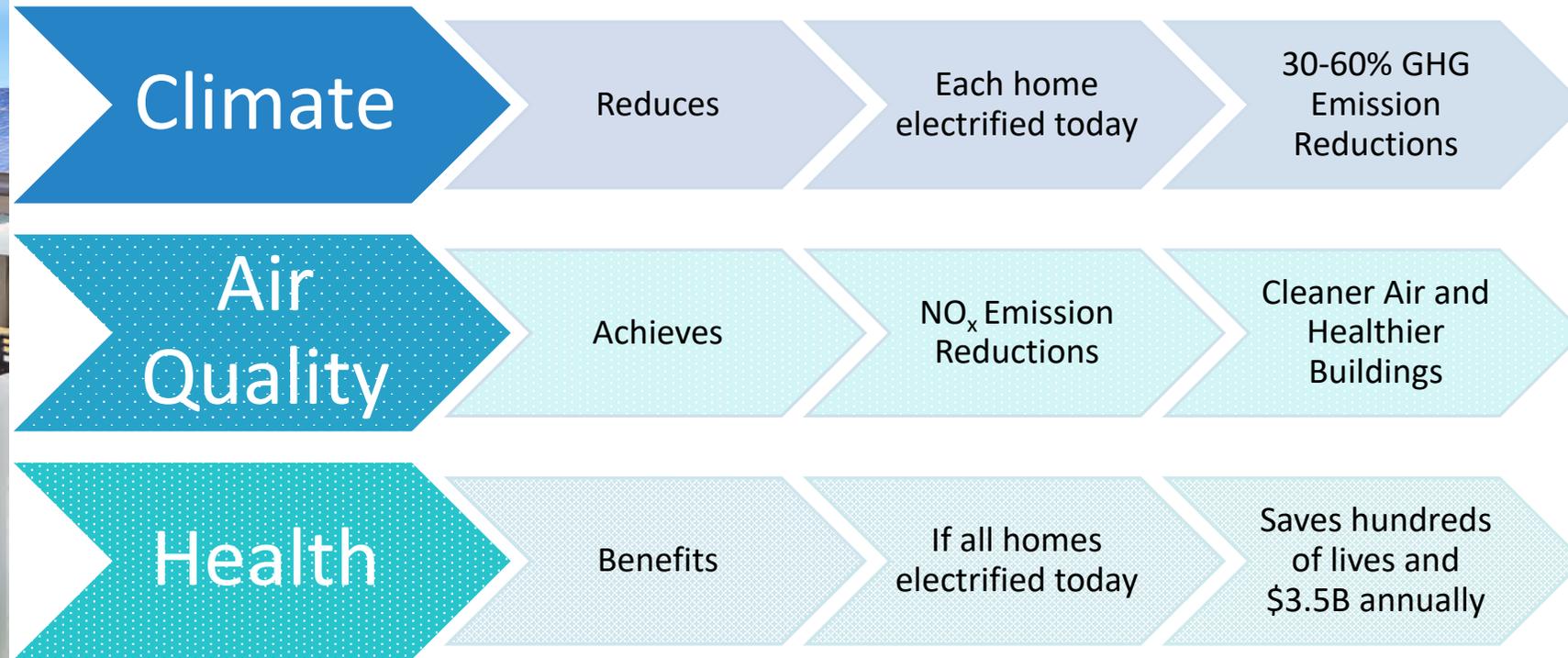


Image Source: iStock Photo

# Building Electrification Reduces Indoor & Outdoor Health Risks



Image Source: SEHAC / CDPH

- 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  $\text{NO}_2$  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

**50 - 400%**  
higher  $\text{NO}_2$   
w/gas stoves



# Technical Feasibility and Market Readiness

## Building Decarbonization

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- 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.



# 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

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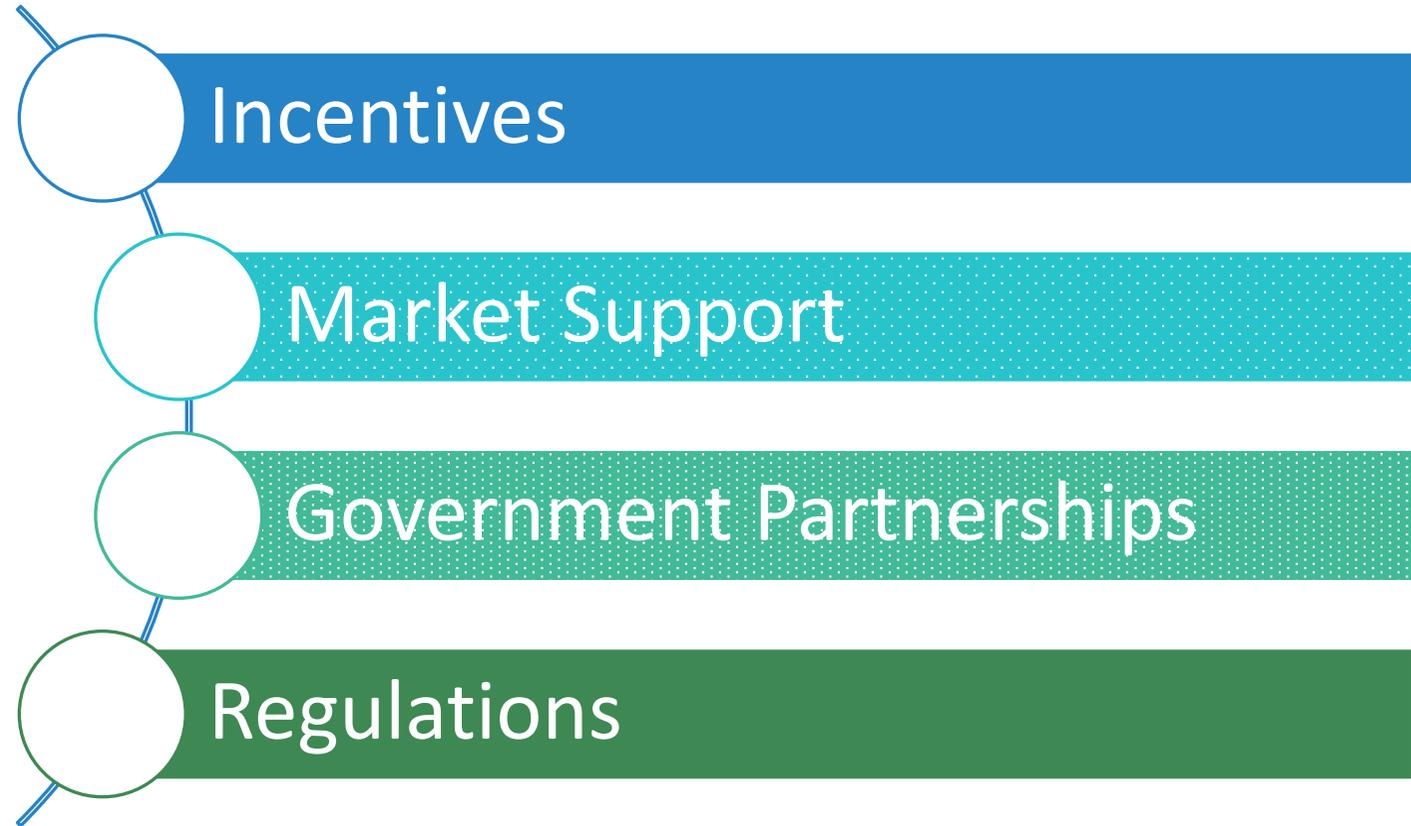
# 2022 Scoping Plan Update

## Building Decarbonization

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### 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



# 2022 State SIP Strategy

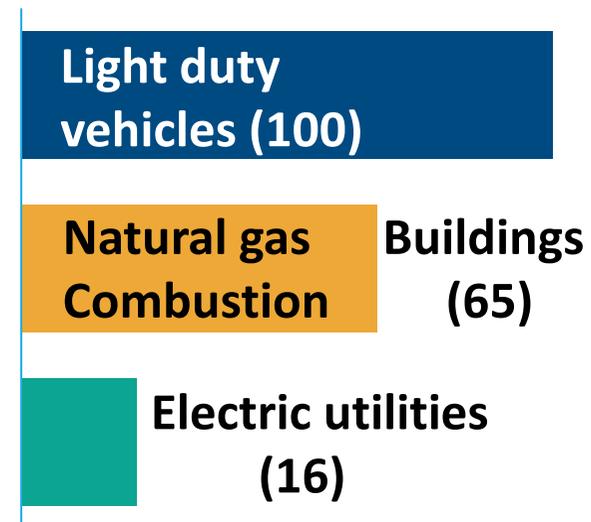
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# 2022 State SIP Strategy

## 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

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# 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

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# Environmental Justice Advisory Committee Member Comments

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# Public Participation: Panel 1

- Panel 1: Public Comments
- Questions and Feedback
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# Break

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WORKSHOP WILL RESUME AT 11:00 AM

# Panel 2 – Consumer Costs and Market Trends

## Introduction to Panelists

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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

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## 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

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WORKSHOP WILL RESUME AT 1:00 PM

# Panel 3 – Opportunities to Advance Building Decarbonization

## Introduction to Panelists

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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

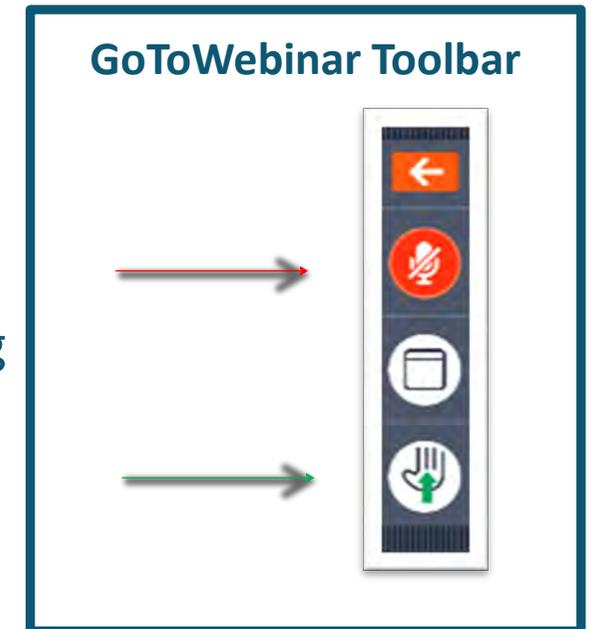
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## Key Topics and Questions:

- **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

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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

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# CARB Timeline and Schedule



# Closing – Staying Engaged

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## Written comments

- [https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=sp22-inputs-ws&comm\\_period=1](https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=sp22-inputs-ws&comm_period=1)
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## Additional resources

- **Scoping Plan:** [www.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan](http://www.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan)
- **2022 State SIP Strategy:** <https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy>
- **CALGreen Code:** <https://www.dgs.ca.gov/BSC/CALGreen>  
<https://www.hcd.ca.gov/building-standards/calgreen/index.shtml>
- **Building Decarbonization Listserve:**  
<https://public.govdelivery.com/accounts/CARB/subscriber/topics>