DOCKETED	
Docket Number:	23-DECARB-03
Project Title:	2024 California Building Energy Action Plan
TN #:	254989
Document Title:	Presentation - Staff Scoping Workshop for the Action Plan
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2024 California Building Energy Action Plan First Public Workshop

Existing Buildings Branch, Energy Efficiency Division

March 12, 2024

Webinar Introduction

Introduction

- Remote Workshop
- Written Q&A via Zoom during the workshop
- Public Comments
  - Midway and end of workshop
  - Please also submit your comments in writing to the docket
  - Written comments due March 26, 2024

Workshop Agenda

9:00 | Webinar introduction and logistics

9:10 | Opening remarks

9:30 | Staff presentation on proposed residential topics

10:30 | Questions and public comment

11:00 | Break

11:15 | Staff presentation on proposed residential and nonresidential topics

11:45 | Questions and public comment

12:15 | Closing remarks & adjourn workshop

Opening Remarks

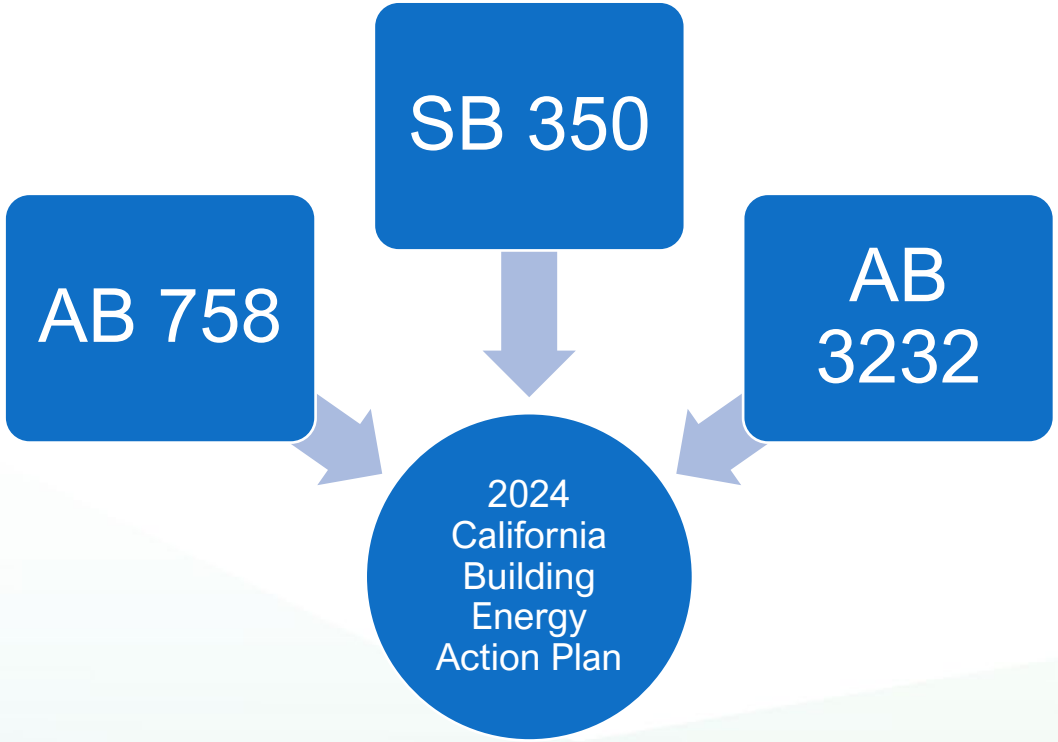
Michael Sokol

Director, Efficiency Division

California Energy Commission

Statutory Authority

- **AB 758** (Skinner, 2009) required the CEC to:
  - Develop comprehensive program to advance existing building energy efficiency (2015 Action Plan)
  - Coordinate with specified agencies, utilities, and other stakeholders
- **SB 350** (De Leon, 2015)
  - Periodically update and refine Action Plan with strong equity focus
  - Updated Action Plans in 2016, 2019
- **AB3232** (Friedman, 2018) – CA Building Decarbonization Assessment published in 2021
- **Building Decarbonization Volume of 2021 IEPR** incorporated most recent Action Plan Update
- **SB 49** (Skinner, 2019) – CEC to pursue technologies and strategies to advance load flexibility

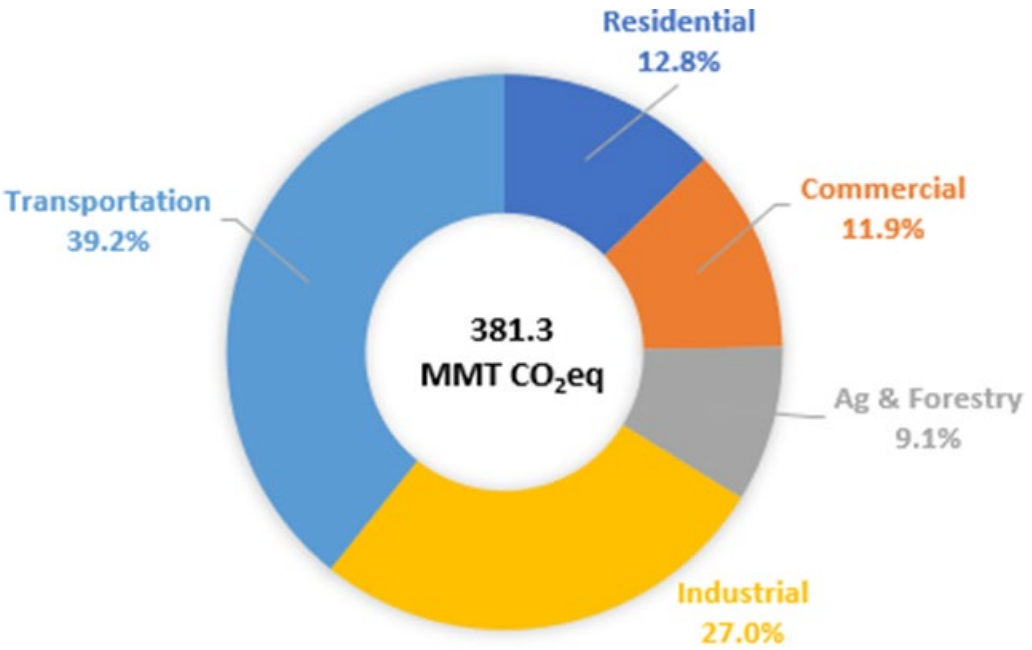


Statewide Building GHG Emissions and Decarbonization Strategies

Residential and commercial buildings account for ~24% of the state's GHG emissions.

Seven key strategies for building decarbonization:

1. Building end-use electrification
2. Decarbonizing the electricity system
3. Energy efficiency
4. Refrigerant leakage reduction
5. Distributed energy resources
6. Decarbonizing the gas system
7. Demand flexibility



Source: CEC staff analysis of CARB emissions inventory, December 2023.

Progress on Previous Action Plan Recommendations

Recommendations from 2021 Building Decarbonization Volume	Subsequent Actions
"prioritize and fund decarbonization retrofits and supporting resources in low-income and disadvantaged communities"	• Statewide Equitable Building Decarbonization (EBD) Program, ≈$840M • Federal HOMES and HEEHRA funding, ≈$580M • TECH incentive expansion, ≈$50M
"Consider statutory changes to enable the CEC to... develop and establish building performance standards "	SB48 (Becker, 2023) authority to develop a strategy for using energy benchmarking data to track and manage energy use of covered buildings.
"a statewide information campaign to familiarize consumers with, and promote, high-efficiency electric appliances and all-electric buildings"	SB68 (Becker, statutes of 2021) which established the Building and Home Energy Resource Hub
"explore regulatory and programmatic approaches to increase the adoption of low-GWP refrigerant technologies and minimize refrigerant leakage"	SB1206 requires CARB and CEC to develop a strategic approach to phasing out high-GWP refrigerants by 2035. Federal EPA Climate Pollution Reduction Grant application.

Six Million Heat Pump Goal and Public Private Partnership

- Governor's Goal of 6 million heat pumps by 2030
  - Letter to CARB in 2022, Based on IEPR 2021 & California Building Decarbonization Assessment
  - Estimated more than 1.5 million heat pumps in California in 2023
  - Public Private Partnership established Fall 2023

Technical Scope

2021 Technical Scope (IEPR Decarb Volume)	Topics Expanded or Added for 2024

• Existing Buildings
  • Remediation costs
  • Benchmarking and building performance standards
• Agency Coordination
• Efficient-Electric New Buildings
• Load Management and Flexible Demand
• Refrigerant Use and Recycling
• Data and Analysis
• Compliance and Enforcement
• Local Leadership and Workforce
• Embodied Carbon
• Industrial and Agricultural Decarbonization
	• Financing
	• Decarbonizing manufactured housing
	• Decarbonizing hard to reach communities
	• Tenant protections
	• Bill impact estimation for consumers
	• Equity metrics
	• Residential panel optimization and upsizing
	• Electric vehicle supply equipment retrofits
	• Zonal decarbonization
	• Voluntary whole-house home energy rating and labeling

Timeline & Milestones

Date*	Milestone
March 12, 2024	First public workshop on the 2024 California Building Energy Action Plan
March 26, 2024	Deadline for public comment from workshop
June 2024	Draft report released
July 2024	Public workshop on Draft Staff Report
October-November 2024	Publication of Final 2024 California Building Energy Action Plan
December 2024	Consideration of Adoption at CEC Business Meeting

**Subject to change*

Proposed Content of the Action Plan

- Introduction
  - History of the Action Plan
  - Scope of 2024 update
- Greenhouse Gas Emissions from California's Existing Building Stock
- Overview of California's Decarbonization Programs
- Progress Toward Doubling of Energy Efficiency Savings by 2030 (SB350)
- Analysis and Recommendations
  - Broken into technical sections as described in the following slides
- Summary of Recommendations

California Building Energy Action Plan Technical Sections

Residential Buildings

Full discussion (F)

- Financing
- Decarbonizing manufactured housing
- Decarbonizing hard to reach communities
- Residential panel optimization and upsizing

Limited discussion (L)

- Bill impact estimation for consumers
- Remediation costs for residential buildings
- Tenant protections
- Building local workforces
- Equity metrics
- Zonal decarbonization
- Whole-house Home Energy Rating and Labeling

Combined Residential and Commercial Buildings

Full discussion (F)

- Benchmarking and building performance standards
- Heat pump alterations and additions to existing buildings

Limited discussion (L)

- Data standardization and sharing
- Embodied carbon
- Energy Code compliance
- Advancing load flexibility
- Electric vehicle supply equipment retrofits
- Refrigerant recovery and recycling

Residential Topic: Financing (F)

Potential scope:

- Variations in program participation rate and perception of barriers with household income
- Innovative and scalable financing models
- Financing as part of a broader effort to encourage equitable participation, opportunities to complement or replace incentives

Seeking additional information:

- Demographic variation in participation in financing programs
- Quantitative information about consumer motivations and perceived barriers to decarbonization
- Pilots or research studies on effectiveness of financing options, loan buy-downs, on-bill financing

Residential Topic: Bill Impact Estimation for Consumers Ⓛ

Potential scope:

- Accuracy and relevance of currently-available bill impact estimations, pre and post
- Opportunities to improve accuracy and relevance
- Using bill impact estimates effectively as part of participant journey
- Use of CEC's Energy Data Warehouse for pre and post decarbonization bill impact estimation

Seeking additional information:

- Examples of bill impact estimators outside California
- Pilots or research studies on how consumers consider bill impacts in the context of decarbonization and home improvement projects
- Analytical methods used for estimating bill impacts both pre and post decarbonization and calibrating them to actual bills

Residential Topic: Remediation Costs for Residential Buildings (L)

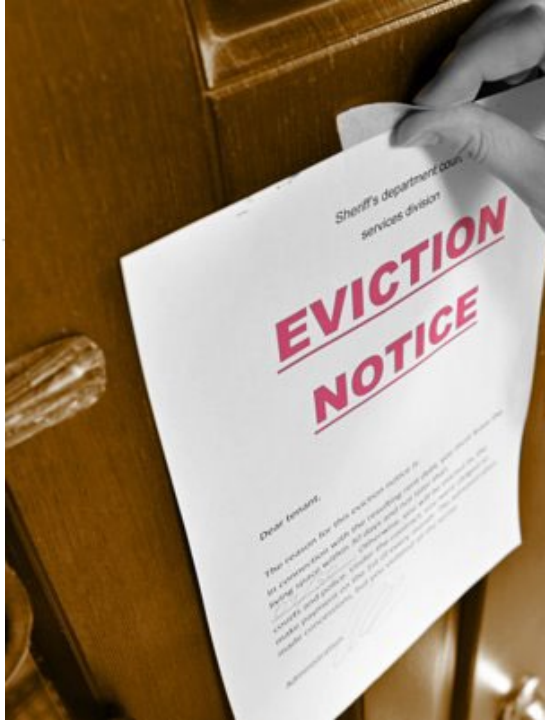
Potential scope:

- Existing efforts and policies on remediation work
- Remediation needs and costs in existing programs such as the San Joaquin Valley Pilots
- Methods for determining which remediation measures should be funded

Seeking additional information:

- What types of measures are included and excluded in the scope of remediation work in current retrofit programs?
- What cost caps are currently implemented and what are lessons learned?
- Information about programs that treat health and safety, or other non-energy issues that may help fill gaps in energy programs

Residential Topic: Tenant Protections (L)



Proposed scope:

- Current program requirements, state laws and local ordinances protecting low-income tenants participating in energy programs
- Statewide alignment on tenant protection best practices (e.g. tenant education, right of first return, rent increase restrictions, eviction prevention, enforcement, and data collection)

Seeking additional information:

- Data on rate of tenant return, rent impacts, and follow up with tenants after implementation of program measures
- Best practices for collection of data on tenant protection
- Tenant protection impact on landlord willingness to participate

Residential Topic: Decarbonizing Manufactured Housing (F)

Potential scope:

- Characterization of the building stock (quantity, age, cost, geographical distribution)
- Energy profile and decarb opportunities
- Decarbonization barriers including equity considerations
- Strategic approaches and costs for decarbonizing manufactured homes

Seeking additional information:

- Successful initiatives from other states and countries
- Equipment cost and installation cost specific to manufactured housing
- Emerging technologies and approaches for manufactured housing

Residential Topic: Decarbonizing Hard to Reach Communities (F)

Potential scope:

- Meaningful and actionable categorization of California's hard to reach communities
- Cost differential for rural decarbonization
- Differences in business practices urban vs. rural
- Barriers and opportunities unique to propane and wood
- Messaging and framing for hard to reach consumers

Seeking additional information:

- Effective ways to describe communities
- Residential and commercial building characteristics
- Differences in attitudes toward decarbonization

Residential Topic: Building Local Workforces (L)

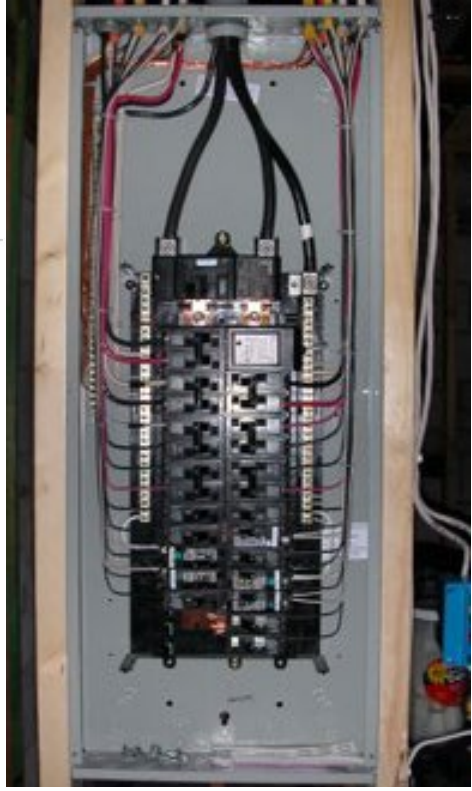
Potential scope:

- Existing local labor requirements and practices for developing workforces
- Local workforce definitions, enforcement of local labor requirements, compliance, costs and benefits

Seeking additional information on:

- Best practices or innovative approaches to contractor education and use workers from local and disadvantaged communities
- Benefits and drawbacks of different methods, including costs, rates of compliance and enforcement
- Factors motivating contractors to work in residential decarbonization
- Difference in business practices, imperatives, attitudes, and resources between small (local) and larger contracting companies

Residential Topic: Residential Panel Optimization or Upsizing (F)



Potential scope:

- Statewide potential need and cost for panel upsizing
- Available technologies and approaches to avoid upsizing
- Impact of panel constraints on building owners
- Current and planned incentive and training programs
- Barriers and opportunities

Seeking additional information:

- How much/how often are building owners required to pay for utility upgrade costs?
- What are the major determinants of the cost of panel optimization or upsizing?
- How many homes and commercial buildings need a panel upgrade or upsize? If statistical models of panel size exist, what is known about their accuracy?
- What current training programs are available to electricians and what information is included?

Residential Topic: Equity Metrics (L)

Potential scope:

- Current use of energy affordability metrics – when operating costs are a significant portion of a household's income
- Opportunities to standardize or improve the use of equity metrics for tracking the success of policies and programs
- Opportunities to further develop quantitative and broadly-applicable equity metrics

Seeking additional information:

- Examples of programs or agencies using energy metrics and how they are tracked
- Information and studies on equity metrics that government agencies can or should incorporate into programs and organizational goals

Residential Topic: Zonal Decarbonization

Potential scope:

- Progress toward zonal decarbonization
- Opportunities and barriers for implementing a zonal approach in CEC-administered decarbonization programs
- Options for partially-zonal approaches such as pre-wiring and neighborhood-scale electrification
- Potential to leverage Federal funding
- Interagency coordination, funding, and research needs

Seeking additional information:

- Surveys, pilots, or similar studies of zonal decarbonization
- Quantitative methods that could be used to assess suitability of neighborhoods
- Costs and barriers

Residential Topic: Voluntary Whole-house Home Energy Rating and Labeling (L)

Potential scope:

- Generating market value of home energy features in real estate by recognition through home energy rating and labeling
- Opportunities to simplify program for stakeholders and lower the cost of getting a rating
- Improving towards a home energy rating and label that is concise and effective

Seeking additional information:

- Methods to create an accurate and uniform single statewide rating scale
- Examples of successful home energy rating and labeling programs nationally and internationally
- Available building energy modeling tools and data sources that can be leveraged

Public Comment

Zoom:

- Use the “raise hand” feature

Telephone:

- Dial *9 to raise your hand
- *6 to mute/unmute your phone line. You may also use the mute feature on your phone.

Zoom/phone participants, when called upon:

- Your microphone will be opened
- Unmute your line
- State your name and affiliation
- Spell your name for the record, begin comments
- Please also submit your comments in writing to the docket

Limited to 1 representative per organization.

3-Minute Timer

Staff Workshop on the 2024 California Building Energy Action Plan

Please Join us After the Break

Back at 11:15

Residential and Commercial Topic: Embodied Carbon Ⓛ

Potential scope:

- Assessment of progress toward embodied carbon goals established in the Building Decarbonization Volume in the 2021 IEPR
- Potential methods of influencing the building industry to reduce embodied carbon
- Funding for development and testing of low embodied carbon building materials and practices

Seeking additional information:

- Rating systems and standards for embodied carbon
- Promising technologies and construction practices for reduction of embodied carbon
- Whether and how embodied carbon ratings and standards are being used in the private sector and by regulators

Residential and Commercial Topic: Benchmarking and Building Performance Standards (F)

Potential scope:

- Status of the statewide benchmarking program
- Potential refinements to that program that may require regulator or legislative action and additional research or funding
- Building performance standards and programs implemented elsewhere, program effectiveness, and lessons learned

Seeking additional information:

- Successful approaches to the implementation of benchmarking programs
- What support can be provided to participants to improve compliance?
- Dealing with data quality issues.
- Existing and planned building performance standards programs, including evaluations if available

Residential and Commercial Topic: Heat pump alterations and additions to existing buildings (F)

Potential scope:

- 2022 code cycle highlights and savings, following recommendations from the 2019 Action Plan
- 2025 code cycle highlights
- Possible directions for 2028 code cycle
- Local ordinances for decarbonization of existing buildings on equipment replacement

Seeking additional information:

- Costs and installation barriers for heat pumps, especially residential furnace to HP alterations
- Cost and other studies on 3-phase and bidirectional battery systems, and thermal energy storage.
- Information from cities/states/countries that have required decarbonization in existing buildings
- Information on advancements in heat pump and battery system technologies
- Data from incentive programs on induction cooktops, HP dryers, HPWH and HP space heating

Residential and Commercial Topic: Code Compliance (L)

Potential scope:

- Assess the extent of unlicensed construction and its impact on energy efficiency.
- Streamline the compliance process to reduce complexity and costs.
- Realign market incentives to prioritize consumer needs for energy efficiency.
- Enhanced oversight of compliance through third party providers

Seeking additional information:

- Better collaboration and support with local enforcement agencies.
- Interest of industry trade groups in improving the compliance process, and providing HVACR distribution and delivery information
- Suggestions for simplifying the energy code compliance process
- Recommendations for education and training programs for compliance professionals

Residential and Commercial Topic: Advancing Load Flexibility (L)

Potential scope:

- Expansion of load flexibility for energy planning and reliability.
- Dynamic rate design to encourage load shifting.
- Development of standards for automating real-time load flexibility.
- Policy support for broadening communication options to better support hard to reach areas.
- Understanding non-energy benefits, customer adoption, bill impact, public awareness, and consumer/contractor education/training.
- Better integrating load flex into incentive and direct install programs.

Seeking additional information:

- Innovative approaches and sources for demand flexibility.
- Broadcast technologies used in other states and countries for appliance load shifting,
- Effectiveness of device features and consumer/contractor education and training

Residential and Commercial Topic: Electric Vehicle Supply Equipment Retrofits (L)

Potential scope:

- Barriers and costs associated with retrofitting EVSE in existing buildings.
- Opportunities to reduce installation cost, especially panel and wiring upgrades, by integrating EVSE installation with building decarbonization in multifamily and commercial buildings.
- Opportunities to integrate vehicle load flexibility with building load flexibility.

Seeking additional information:

- Examples of cost reduction or avoided infrastructure costs from novel approaches to integrating EVSE installations with building decarbonization
- Technical opportunities to integrate EVSE with building load flexibility and/or energy storage.

Residential and Commercial Topic: Data Standardization and Sharing (L)

Potential scope:

- Using shared data from programs, interval meters, and other sources to track outcomes such as the CEC's six million heat pump goal, cost-effectiveness, equity, and bill impacts
- Using shared data to support program implementation by improved targeting, and by quickly identifying patterns of failure
- Making integrated energy datasets available to the public to foster innovation
- Integrating energy data with other datasets such as health, equity, and economic data

Seeking additional information:

- Potential use cases for analysis of the data in the CEC's Energy Data Warehouse, in the interest of state agencies, utilities, advocates and private companies
- Existing examples, standards or best practices for sharing program and/or energy data

Residential and Commercial Topic: Refrigerant Use, Recovery and Recycling

Potential scope:

- Upcoming standards to phase out high global warming potential (GWP) refrigerants.
- Implementing SB1206, which requires CARB to develop a strategy to transition away from hydrofluorocarbons (HFCs) by 2035.
- Current practices for refrigerant recovery and recycling, and refrigerant market structure.

Seeking additional information:

- Emerging refrigeration technologies and practices that will support the transition away from HFCs.
- Barriers to adopting environmentally friendly refrigerants and best practices for refrigerant recovery and recycling programs.

Public Comment

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3-Minute Timer

Closing Remarks

Program Webpage: Energy Efficiency in Existing Buildings at https://www.energy.ca.gov/programs-and-topics/programs/energy-efficiency-existing-buildings

- Submit written comments to Docket: **23-DECARB-03**
- Comments are due **March 26, 2024**

- Staff Contact: ExistingBldgDecarb@energy.ca.gov