

## **Zero-Emission Space and Water Heater Standards**

Public Workshop
December 11, 2025
9:00 a.m. - 12:30 p.m.

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## Space and water heater standards



### Reduce climate pollutants.

- Space and water heaters account for ~10% of statewide greenhouse gas (GHG) emissions.
- Strategy for achieving 2045 carbon neutrality targets in the 2022 Scoping Plan.



## Improve air quality and public health.

- Space and water heaters account for ~5% of statewide nitrogen oxides (NOx) emissions.
- 2022 State Implementation Plan (SIP) Strategy included space and water heater GHG emission standards.



## **Process and Learnings to Date**

## 2022: Strategic Commitments

- State Strategy for the State Implementation Plan (SIP)
- Scoping Plan

## 2023: Kickoff and Planning

- 1 Workshop
- Public Engagement Planning

#### 2024: Public Engagement

- 2 Workshops
- 11 Listening Sessions
- 10 Public Expert Meetings

#### 2025: Further Concept Development

- Update to Environmental Justice Advisory Committee (EJAC)
- Outreach and Engagement Report

#### **Resources:**

- Public Outreach and Engagement Reports
- EJAC Building Decarbonization Resolution
- Staff Response to EJAC Resolution



## **Regulatory Concept Evolution**

#### **2022 State SIP Strategy Concept:**

100% sales must meet zero-GHG emission targets starting in 2030

### May 2024 Concept:

Different types and sizes of equipment must meet zero-GHG emission targets starting in 2027 and ending in 2033

#### **December 2025 Proposal:**

Emissive sales limits combined with a credit system to provide flexibility to address regulated entity and end user challenges



# Today's Agenda (1 of 5)

- 1) Revised Regulatory Proposal
- 2) Summary of Public Engagement Feedback
- 3) Update on Staff Analysis
- 4) Public Comments



# **Revised Regulatory Proposal**

## Limits on Emissive Equipment Sales

 Sales of new space and water heaters in California must not exceed limits on emissive equipment sales.

## Credit System for Compliance Flexibility

 As a flexible alternative compliance pathway, credits can be earned, banked, or traded to comply with regulation.





# Rationale: Limits on Emissive Equipment Sales

- Previous Regulatory Concepts: Focused on 100% zero-emission new sales targets.
- Public Feedback: Not feasible given end-user challenges.
- Goals Achieved by Revised Regulatory Proposal:
  - Provides gradual, achievable limits for emissive equipment sales.
  - Focuses on decreasing sales of polluting equipment to achieve emission reductions.





# Rationale: Credit System for Compliance Flexibility

- Previous Regulatory Concepts: Did not include flexibility.
- Public Engagement Feedback:
  - Manufacturers requested CARB incorporate exemptions and flexibility for certain situations.
  - Exemptions slow progress towards equitable decarbonization if communities facing barriers are left behind.
  - Explore credit or market-based programs.

## Goals Achieved by Revised Regulatory Proposal:

- Credit system offers multiple compliance pathways for flexibility to encourage technology innovation and donations to incentive programs to address equity and end-user challenges.
- Market-wide emission reduction goals rather than exemptions to ensure communities facing barriers are not left behind.



# **Emissive Sales Limit Revised Regulatory Proposal**

**Emissive Equipment Sales** <sub>Manufacturer</sub> ≤ **Total Equipment Sales** <sub>Manufacturer</sub> x **Emissive Sales Limit (%)** 

Where sales refers to equipment produced and delivered for sale or sold in California.

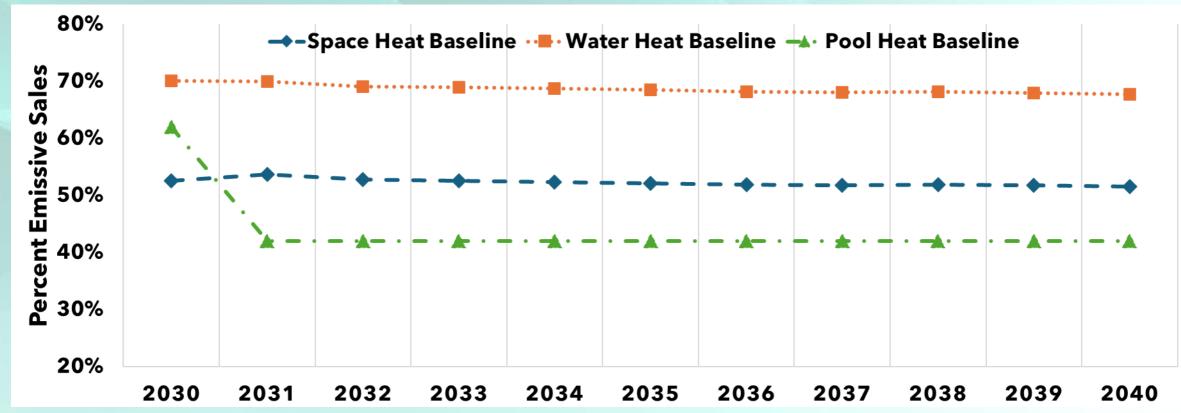
Equipment with a rated heat input capacity up to 2,000,000 Btu/hour must comply with emissive sales limits (%) starting on January 1, 2030.

#### **Proposed Statewide Emissive Sales Limits**

Year	Space	Water	Pool
	Heating	Heating	Heating
2030	40%	60%	60%
2031	39%	59%	40%
2032	37%	58%	40%
2033	36%	57%	40%
2034	34%	56%	40%
2035	33%	55%	40%
2036	31%	54%	40%
2037	30%	53%	40%
2038	28%	52%	40%
2039	27%	51%	40%
2040	25%	50%	40%
2041	25%	50%	40%
2042	25%	50%	40%
2043	25%	50%	40%
2044	25%	50%	40%
2045	25%	50%	40%



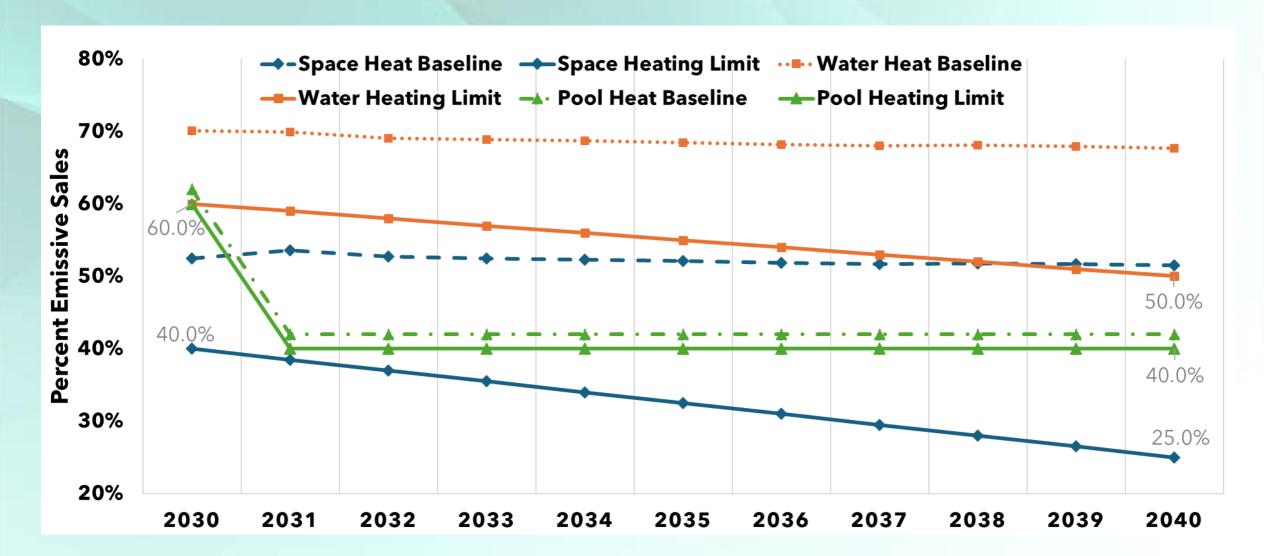
## **Emissive Sales Baseline**



- Assumptions include estimated impacts from 2025 Energy Code, Bay Area rules 9-4 and 9-6, and South Coast Rule 1146.2
- Emissive sales expected to decrease gradually over time as newly constructed buildings that are more likely to utilize zero-emission heating equipment make up a larger share of the total building stock.
- Pool emissive sales are assumed to drop considerably in 2031, aligning with compliance dates for pool. heaters under South Coast Rule 1146.2



## **Emissive Sales Baseline and Proposed Emissive Limits**





# **Emissive Sales Limit Alternative Regulatory Concepts**

#### **Alternative 1 (Less Stringent)**

Year	Space Heating	Water Heating	Pool Heating
2030	45%	65%	60%
2031	44%	64%	40%
2032	42%	63%	40%
2033	41%	62%	40%
2034	39%	61%	40%
2035	38%	60%	40%
2036	36%	59%	40%
2037	35%	58%	40%
2038	33%	57%	40%
2039	32%	56%	40%
2040	30%	55%	40%
2041	30%	55%	40%
2042	30%	55%	40%
2043	30%	55%	
2044	30%	55%	40%
2045	30%	55%	40%

#### **Alternative 2 (More Stringent)**

Year	Space Heating	Water Heating	Pool Heating
2030	30%	50%	50%
2031	28%	49%	30%
2032	26%	47%	30%
2033	24%	46%	30%
2034	22%	44%	30%
2035	20%	43%	30%
2036	18%	41%	30%
2037	16%	40%	30%
2038	14%	38%	30%
2039	12%	37%	30%
2040	10%	35%	30%
2041	10%	35%	30%
2042	10%	35%	30%
2043	10%	35%	30%
2044	10%	35%	30%
2045	10%	35%	30%



## **Credit System for Compliance Flexibility**

- Credit Earning: Manufacturers earn credits with CARB approved actions.
  - Generally, 1 credit for each piece of zero-emission equipment
  - Greater than 1 credit for larger zero-emission equipment based on size/capacity
  - Greater than 1 credit for innovative zero-emission technology, donations, and others
- Credit Deficit: If a manufacturer sells more emissive equipment than allowed by the emissive limit, they have a credit deficit. Manufacturers have up to three years to make up a credit deficit.
- Credit Banking: Manufacturers can bank excess credits earned in one year and use them in future years.
- Credit Trading: Manufacturers can buy, sell, or trade credits from others to meet the requirements.



# Year 2030: Example of Determining Credits Below Limit or Credit Deficit

Manufacturer	Example 1	Example 2
2030 Emissive Sales Limit for Space Heating (%)	40%	40%
Manufacturer Sales Portfolio Emissive Equipment Zero-Emission Equipment	50% 50%	0% 100%
Total Sales (units)	10,000	125,000
Actual Emissive Sales (units)	5,000	0
Emissive Equipment Sales Limit (units)	4,000	50,000
Below Limit: Counts for Credit Generation	0	50,000
Credit Deficit	1,000	

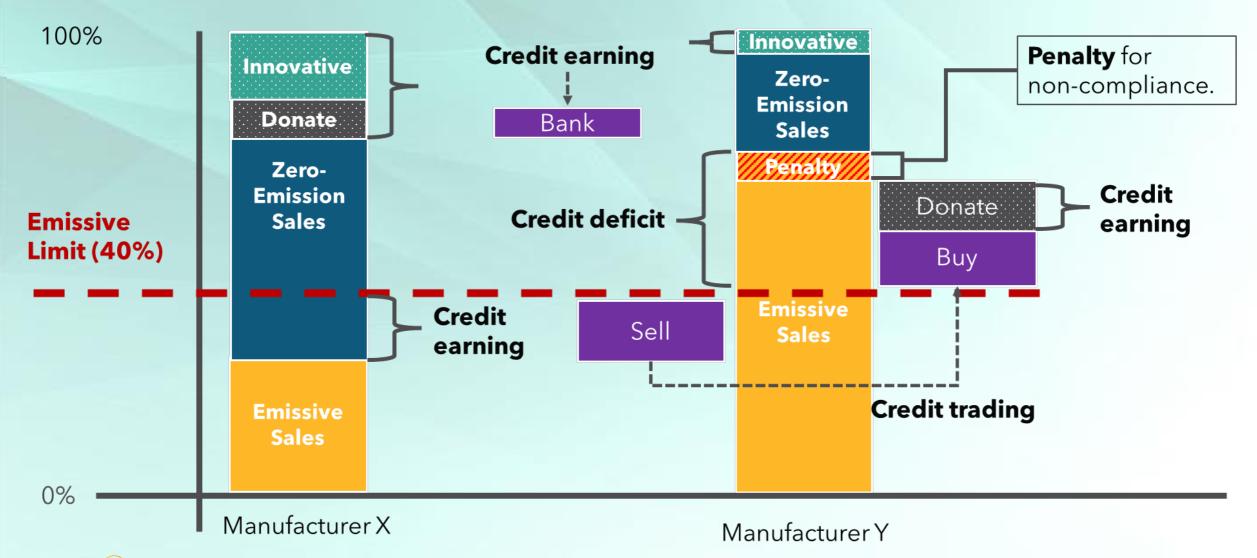
# Determining Below Limit or Credit Deficit =

Emissive Equipment Sales Limit
- Actual Emissive Equipment Sales





# **Emissive Limit Credit System**



# Potential Credits Focused Primarily on Emission Reductions

Credit Earning Actions	Rationale	Proposed Value of Credit	Credit Limits
Pre-2030 Early Compliance	Reduces emissions prior to target date	1.0	Sunset by 2035
Emissive Sales Below the Limit	Encourages fewer emissive sales below limit	1.0	Sunset 5 years after earning



# Potential Credits Focused Primarily on End User Issues and Equity

Credit Earning Actions	Rationale	Proposed Value of Credit	Credit Limits
<ol> <li>Innovative ZE Technology:</li> <li>Cold-climate certified heat pumps</li> <li>Low-power (120 Volt) water heater heat pumps</li> <li>Equipment with integrated battery storage</li> <li>Large capacity (&gt;300,000 Btu/hr) packaged rooftop units</li> </ol>	<ol> <li>Addresses some end user issues:</li> <li>Supports heating in cold climate regions</li> <li>Addresses electrical panel constraints; may reduce retrofit costs</li> <li>Improves resiliency and reduces retrofit needs</li> <li>Helps decrease retrofit costs in large buildings</li> </ol>	1.05 - 2.5	Sunset 5 years after earning
Donate: Donate or discount ZE equipment to equitable decarbonization incentive programs (e.g., California Energy Commission's Equitable Building Decarbonization program.)	Addresses equity by reducing upfront costs in priority communities	2.5	Sunset 5 years after earning



# Potential Credits Focused on Reducing the Impacts of Refrigerants

- Senate Bill 1206 phases in requirements for reducing the global warming potential (GWP) of newly produced bulk hydrofluorocarbons (HFCs) or bulk HFC blends sold into the state between 2025 2033 and beyond, and asks CARB to assess how to transition the state's economy away from HFCs to ultra-low GWP alternatives by 2035.
- Existing CARB rules establish a prohibition on HFCs with a GWP of 750 or greater for all types of space conditioning heat pumps.
- Credit generating actions would encourage further reductions of HFC emissions beyond those required by existing statute, such as using refrigerants with GWP levels lower than those currently found in equipment available on the market.

Credit Earning Actions		Proposed Value of Credit	Credit Limits
<ol> <li>New equipment using refrigerants with GWPs below current use cases and regulatory requirements. GWPs (GWP&lt;10 as defined in SB 1206).</li> <li>Reclaimed refrigerants for new equipment.</li> </ol>	<ol> <li>Reduces short lived climate pollutants</li> <li>Encourages recovery of HFCs from existing equipment, limiting the production of new HFCs</li> </ol>	Up to 2.5 (scaling based on refrigerant charge size)	Sunset 5 years after earning



## Reporting and Recordkeeping

### Who reports?

- Manufacturers and distributors must comply with reporting requirements.
- CARB will provide reporting templates for regulated entities to submit reports

### Reporting Requirements Summary (details next slide)

- Initial Report:
  - Purpose: Collect entity contact information and initial equipment sales portfolio
  - Due by July 1, 2029
- Annual Report:
  - Purpose: Collect and track equipment sales, purchases, and credits to determine compliance
  - Due annually starting in 2030
    - Optional annual report for 2028 and 2029 to receive applicable credits.

### **Recordkeeping Requirement**

• Regulated entities must keep records for at least 5 years after submitting report.



## **Reporting Requirements Details**

## **Initial Report:**

- Manufacturers and distributors:
  - Contact information: entity name, business ID, designated point of contact, etc.
  - Report equipment sales and purchase volumes by equipment type and size for 2028 calendar year.

## **Annual Report:**

- Manufacturers:
  - Sales volume into California by equipment type, model family, size, and name of purchaser, including business ID.
  - Total credits earned, banked, sold/traded, and deficit.
- Distributors:
  - Purchase volume by equipment type, model family, size, manufacturer/brand, and name of who it was purchased from, including business ID.

**Note:** Reporting requirements would align with the California Energy Commission's Energy Data Collection Rulemaking to the extent possible.

CARB

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- 1) Revised Regulatory Proposal
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## **Outreach and Engagement Update Report**

- Presents an update on public engagement activities
- Summarizes key themes and related staff actions

SPUR and Tenderloin Neighborhood Development Corporation

Construction Trades Workforce Initiative and UA342



Northern California Virtual

Valley

Climate Resilient Communities, Menlo Spark, 350 Silicon

Southern

**2024 Listening Sessions** 

Sierra Energy Reimagined

> Central California Virtual

> > Allensworth Progressive Association

> > > Climate Action Campaign

Campaign

Link to Report: Public Engagement

### **August - October**

California

Virtual

- 7 in person, co-hosted
- 4 virtual: 3 CARBhosted and 1 co-hosted



## **Summary of Public Engagement Feedback**

## **End-User Challenges**

- Housing affordability is an ongoing concern
- High installation costs and limited incentives
- Addressing high energy costs is key to success
- Building conditions such as space constraints or limited electrical panel capacity can hinder decarbonization.
- Rural and off-grid areas face greater challenges with limited access to zero-emission technology that performs well in cold climates and electric grid reliability.
- Allow for "dual fuel" systems where appropriate and cost effective.
- Renters need protections from potential increased rent, renovictions, or evictions tied to building upgrades.



## Summary of Public Engagement Feedback (cont.)

## Input on Suggested Changes to Regulatory Design

- Incorporate exemptions and flexibility for certain situations.
- Explore credit or market-based programs.
- Adjust compliance timelines.
- Ensure that equipment refrigerant does not leak and that it is recovered at the end of appliance life.
- Include warranty and labor provisions to protect consumers.
- Require labeling or stickers on heating equipment.

## Input on Recommendations for Implementation Planning

- Workforce must be prepared for zero-emission heating
- CARB should coordinate with public agencies
- Outreach and education are important



# Goals Addressed by Revised Regulatory Proposal Achieving Equitable Building Decarbonization

## Regulatory Design:

- **Gradual, achievable limits** that do not require 100% zero-emission sales, particularly where infrastructure and building conditions pose near-term limitations.
- Market-wide emission reduction goals rather than exemptions to ensure communities facing barriers are not left behind.
- Flexible compliance pathways that support strategies to address equity, overcome end-user constraints and ease program implementation.
- Implementation Planning: Strengthen and align state strategies to expand support for under-resourced communities and close program implementation gaps.



# **Public Engagement**

- Proposed Implementation Planning and Interagency Coordination: strategy-building with input from agency partners and public experts.
  - Key topics:
    - Building-level policies (e.g., Building Codes and building performance standards)
    - Cost considerations (e.g., incentive programs, energy rate design)
    - Infrastructure and energy system considerations
    - Implementation planning and support (e.g., workforce development, supportive housing policies, public outreach, education and awareness)
- Outreach and Education Resources: fact sheets and guides to address frequently asked questions and concerns.
  - **Key topics:** Benefits of zero-emission heating, electricity supply and reliability, building retrofits, cost considerations, tenant impacts and protections.



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# **Staff Analysis Overview**

# **Technology Assessment**

- Evaluate available technologies, including key specifications and associated costs
- Analyze technology adoption and transition rates

### **Emission Modeling**

- Develop scenarios for equipment installations and future energy demand
- Estimate GHG and criteria pollutant emissions.
- Public health benefits estimated from NOx and PM2.5 reductions

# Building Retrofits Assessment

- Characterize existing building conditions relevant to retrofit needs
- Evaluate potential retrofit actions and their associated costs

### **Cost Analysis**

- Assess cost impacts on households and businesses
- Conduct macroeconomic analysis of broader economic effects



### **Equity Analysis**

- Identify vulnerable or disproportionately affected populations
- Assess disparities in impacts and benefits across groups



# **Zero-Emission Space Heater Technology**

I	Technology Types	Status	Considerations
	Electric Resistance	Technology is ready and widely available but is discouraged in California's Energy Code.	<ul><li>High operating costs.</li><li>Moderate capital costs</li><li>Slow heating times.</li></ul>
	Heat Pumps	Technology is ready and widely available.	<ul> <li>Low operating costs.</li> <li>High capital costs.</li> <li>Roof area limitations for packaged systems.</li> <li>May experience efficiency losses in cold weather.</li> </ul>
	Heat Recovery Chiller	Technology is ready and widely available.	<ul> <li>Low operating costs.</li> <li>Requires significant simultaneous heating and cooling loads to be effective.</li> </ul>
	Hydrogen Fuel Cell	Not readily available in U.S.	<ul><li>Requires sufficient hydrogen fuel availability.</li><li>High operating and capital costs.</li></ul>



# **Zero-Emission Water Heater Technology**

Technology Types	Status	Considerations
Electric Resistance	Technology is ready and widely available, although federal rules will restrict production of many common electric resistance storage tank sizes beginning in 2029.	<ul> <li>High operating costs</li> <li>Moderate capital costs.</li> <li>Slow heating times.</li> </ul>
Heat Pump	ready and widely available.	<ul> <li>Low operating costs.</li> <li>High capital costs</li> <li>Larger tanks than traditional units.</li> <li>Requires condensation removal and adequate ventilation.</li> </ul>
Hydrogen Fuel Cell	Not readily available in U.S.	<ul><li>Requires sufficient hydrogen fuel availability.</li><li>High operating and capital costs.</li></ul>
Solar Thermal	Technology is ready.	<ul><li>Limited site feasibility.</li><li>High maintenance requirements.</li></ul>



# **Emissions Modeling**

#### **Building Stock**

- California Energy Commission (CEC) Integrated Energy Policy Report (IEPR) Forecast
- 5 Residential Building Types
- 12 Commercial Building Types

#### **Energy Demand**

- CEC IEPR Forecast for fossil gas demand
- CEC Codes and Standards Enhancement (CASE) report for nonresidential pool demand
- National Renewable Energy Laboratory (NREL) Residential Building Stock (ResStock) and Commercial Building Stock (ComStock) for propane demand

#### **Equipment Turnover**

- Equipment lifetime assumptions from CEC Fuel Substitution Scenario Analysis Tool.
- Assuming equipment replacements on burnout

#### **Building Retrofit Conditions**

 Percentage of buildings requiring different levels of panel capacity or physical space retrofits.

#### **NOx/PM2.5 Reductions**

 Apply percent reduction to CARB California Emission Projection Analysis Model (CEPAM) inventory

#### **Health Impacts**

 Public health benefits based on avoided NOx/PM2.5 emissions



#### **Emissions Model**

**Change in Energy Demand** 

#### **Equipment replacements**

 Equipment replacement volumes and building retrofit counts

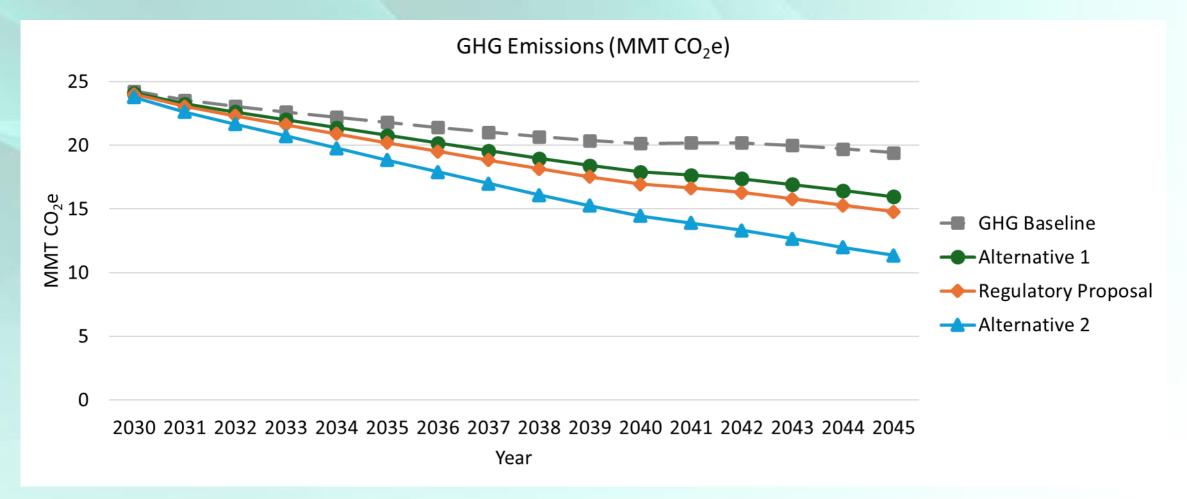
#### **Cost Model**

- Energy Bill costs
- Equipment and retrofit costs

#### **GHG Emission Reductions**

Apply GHG emission factors

## **GHG Emissions Results**

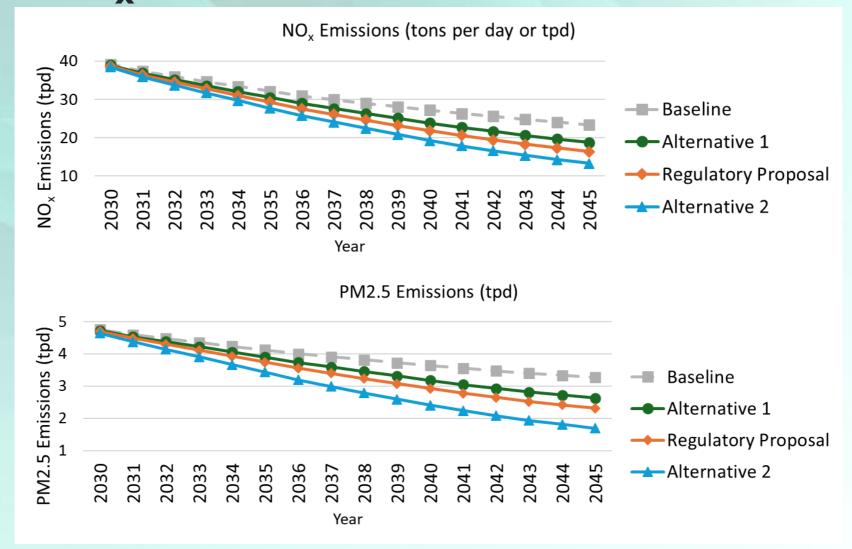


### 2030-2045 Cumulative GHG Emission reductions:

- 27 MMT CO2e for Alternative 1
- 39 MMT CO2e for Regulatory Proposal
- 69 MMT CO2e for Alternative 2



## NO<sub>x</sub> and PM2.5 Emissions Results



#### 2030-2045 Cumulative Emission Reductions:

- 23,000 tons NOx for Regulatory Proposal
- 3,100 tons PM2.5 for Regulatory Proposal



# Estimated Health Impacts from Regulatory Concept (2030-2045)

Health endpoint	Number of cases avoided
Cardiopulmonary mortality	636
Hospitalizations for cardiovascular illness	131
Cardiovascular Emergency Department Visits	165
Acute Myocardial Infarction, Nonfatal	70
Hospitalizations for respiratory illness	20
Respiratory Emergency Department visits	361
Lung cancer incidence	47
Asthma onset	1,409
Asthma symptoms	1,142,432
Work Loss Days	88,163
Alzheimer's Disease	311
Parkinson's Disease	44



### **Building Retrofits**

Establish analysis scope

Building retrofit analysis

External review

Revise analysis (we are here!)

#### **Existing building stock**

- ResStock
- ComStock
- through 2018

#### End uses

- Space heating
- Water heating

#### **Analysis areas**

- Electrical capacity
- Physical space

#### **Considerations**

- Equipment types
- Building attributes
- Retrofit costs

#### **Retrofit Levels**

- No retrofit
- Basic
- Moderate
- Extensive

#### **Review team**

- Public experts
- Technical experts
- Public agency staff

#### **Key changes**

- Mobile/manufactured home revisions
- Replacement technology revisions
- Improved estimates for residential water heater location
- Outdoor installation option for water heaters



### **Building Retrofit Analysis**

## Understand potential retrofit needs and gather/examine data:

- · Literature review
- Presentations, briefings, site visits
- Expert feedback
- Review of existing data sources

### **Evaluate relevant building characteristics:**

- Equipment type
- Equipment size, quantity, and location within the building
- Peak energy loads
- Roof area and number of stories
- Climate
- Existing A/C

# Estimate retrofit levels for electrical capacity and physical space by building type and region:

- No retrofit
- Basic retrofit
- Moderate retrofit
- Extensive retrofit

Emissions Cost Equity
Modeling Analysis Analysis



### **Electrical Capacity - Space and Water Heating**

Retrofit Level	Retrofit Actions	Residential	Nonresidential
No Retrofit	<b>Residential:</b> Both end uses already zero-emission <b>Nonresidential:</b> Both end uses already zero-emission or have equipment with fuel type or capacity not covered in the proposed standard.	13%	32%
Basic	Minimal Retrofits Needed  Adequate panel capacity and physical breaker space. May require wiring to new circuit.	32%	23%
Moderate	Panel Optimization Lacks physical breaker space. Install either smart circuit breakers, smart panel, circuit pausers, load-sharing devices, sub-panel, meter collars, or smart splitter.	41%	39%
Extensive	Panel Upsizing and Service Entrance Upgrades  Lacks adequate panel capacity and service entrance capacity.  Install a larger electrical panel and either an overhead or underground service connection.	14%	6%



### **Physical Space - Space Heating**

Retrofit Level	Retrofit Actions	Residential	Nonresidential	
No Retrofit	<b>Residential:</b> Already zero-emission <b>Nonresidential:</b> Already zero-emission or have equipment with fuel type or capacity not covered in the proposed standard.	27%	53%	
Basic	Residential: Install basic wiring and the least-cost replacement technology  Nonresidential: Install basic wiring and a replacement space heater in the same location as the existing air conditioning unit.	73%	15%	
Moderate	<b>Nonresidential:</b> Install a replacement space heater with a larger footprint on the roof or ground.	N/A	31%	
Extensive	<b>Nonresidential:</b> Reconfigure the roof or give up interior space to make room for a replacement space heater with a larger footprint.	N/A	<1%	



### **Physical Space - Water Heating**

Retrofit Level	Retrofit Actions	Residential In-Unit	Residential Centralized	Nonresidential
No Retrofit	<b>Residential:</b> Already zero-emission <b>Nonresidential:</b> Already zero-emission or have equipment with fuel type or capacity not covered in the proposed standard.	18%	32%	49%
Basic	<b>Residential:</b> Install basic wiring or add an outdoor enclosure to a water heater already located outside <b>Nonresidential:</b> Install basic wiring or louvers for additional ventilation in the existing mechanical room.	50%	36%	22%
Moderate	Residential: Relocate to garage or add ventilation to the current location Nonresidential / Residential - Centralized: Install ducted ventilation or install replacement water heater outdoors for buildings with multiple water heaters.	26%	16%	28%
Extensive	Residential: Major renovation needed to relocate water heater Nonresidential / Residential - Centralized: Expand the mechanical room or relocate the water heater, reroute piping/wiring, and add water storage tanks.	7%	16%	1%



### **Equity Analysis**

- Households experience different combined retrofit needs when undertaking emissive to zero-emission conversions.
- They also have different resources: income, owner/renter status, and other factors.
- A regulatory target should be set in a way that does not require low-resource, high-retrofit need households to go to ZE equipment.
- However, exemptions could leave the same households behind from pollution reduction benefits.
- We consider equity implications of our proposed target by calculating the potential distribution of emissive to ZE replacements across different retrofit and household resource levels.
- We recognize the important role of incentive programs to close affordability gaps for households otherwise unable to adopt ZE equipment.
- The current proposal's credit categories aim to address barriers by supporting equitable decarbonization programs and increasing technology offerings that reduce retrofit needs.

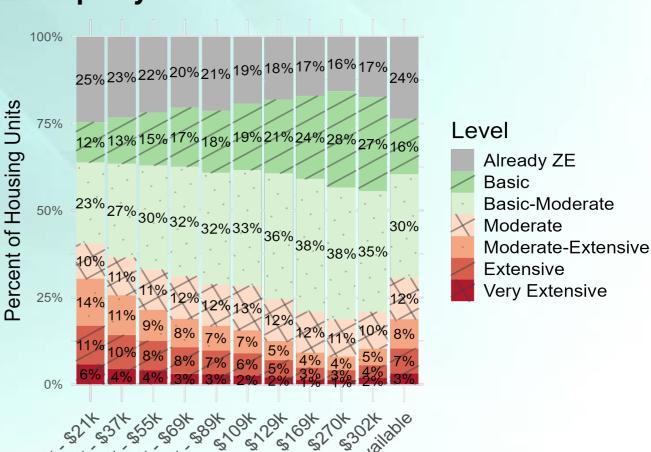


### **Equity Analysis: Retrofit Needs by Income Range**

#### Low-income households face greater combined retrofit needs.

- Emissive sales limits were informed by the distribution of retrofit burdens for the lowest-income households.
- Replacement technology choices (e.g., low-voltage options) affect actual retrofit needs.

### **Combined Physical Space and Electrical Capacity Retrofit Needs for Water Heaters**



2019 Income Range (Thousands \$USD, Statewide Deciles)



### **Cost Analysis Method**

#### **Equipment Cost**

- Equipment adoption scenarios
- Unit price and expected useful life

### Installation/Retrofit Cost

- Building retrofit needs and profiles
- Retrofit actions and associated installation costs

#### **Administrative Cost**

- Product reporting and certification requirements
- Administrative staffing needs

#### **Operation Cost**

- Energy demand scenarios
- Current and forecasted energy rates
- Maintenance cost of equipment

#### **Cost Modeling**

- Quantify incremental cost impacts on households and businesses over a 15-year horizon
- Examine broader economic impacts using regional economic model (REMI)

### Tax, Fee, and Adjustments

- Sales tax, energy surcharges, utility use tax, and permit/inspection fees
- Region-specific labor cost adjustments and CPI-based inflation factors

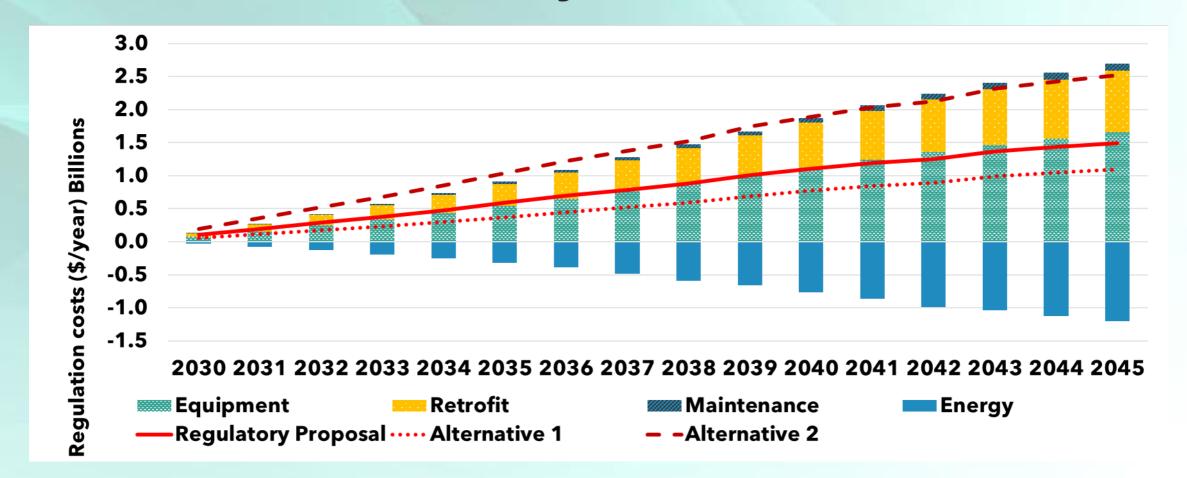


### **Cost Analysis: Feedback Summary from Public Experts**

- Provided additional references and data sources for equipment cost assumptions.
- Consider air conditioners (AC) as baseline equipment and apply a 50% adjustment to AC upfront costs for buildings with existing AC based on replacement probability.
- Incorporate current utility rates and the latest price forecasts from the California Energy Commission's 2025 Integrated Energy Policy Report (IEPR)
- Recognize expected increases in equipment and installation costs due to material price volatility, supply chain constraints, and tariffs



### **Preliminary Cost Results**



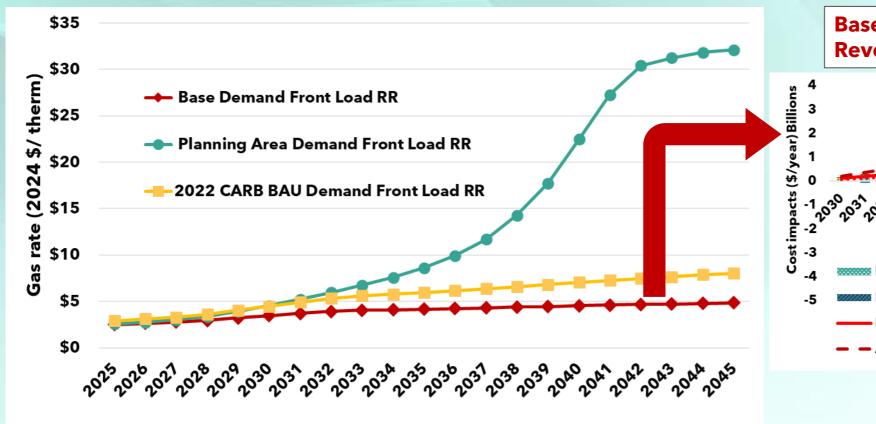
#### 2030-2045 Cumulative incremental costs:

- \$ 9.1 billion for Alternative 1
- \$13.3 billion for Regulatory Proposal
- \$22.8 billion for Alternative 2

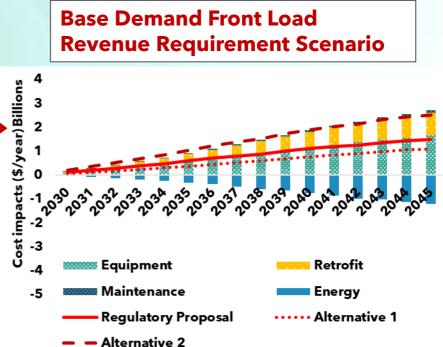


#### Impact of Gas Price Uncertainty on Total Cost Estimates

Total cost results are sensitive IEPR gas rate scenarios





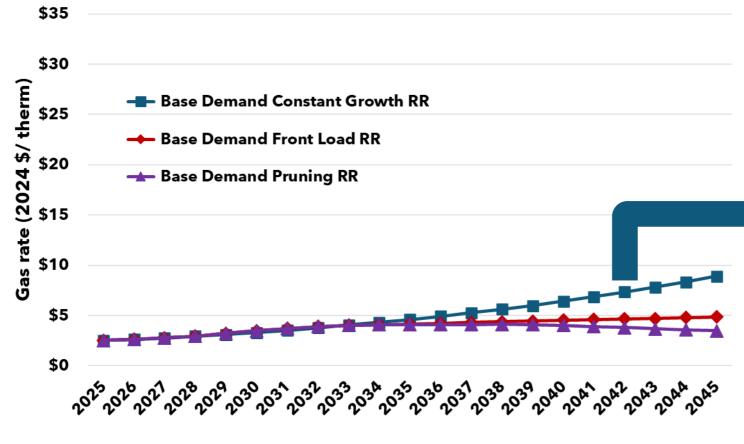




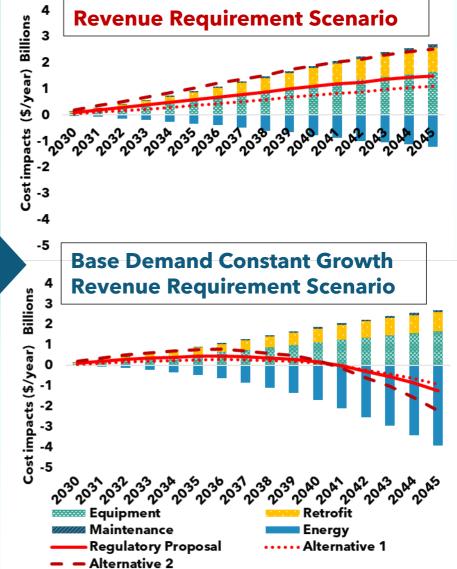
### Impact of Gas Price Uncertainty on Total Cost Estimates (cont.)

Costs shown above use conservative Front Load RR scenario





\*Rate projections for PG&E residential customers as an example



**Base Demand Front Load** 



### Today's Agenda (4 of 5)

- 1) Revised Regulatory Proposal
- 2) Summary of Public Engagement Feedback
- 3) Update on Staff Analysis
- 4) Public Comments



### **Summary: Revised Regulatory Proposal**

#### Addresses Public Feedback

- Provides gradual, achievable emissive sales limits rather than 100% zero-emission sales targets.
- Market-wide emission reduction goals rather than targeted exemptions do not leave communities facing barriers behind.
- Credits aim to address end-user challenges and lower costs for priority communities.

### Adjustments to Proposal Due to Staff Analysis

- Informed percentage targets for emissive sales limits
- Used to develop credit categories, proposed values, and credit caps



### **Questions: Revised Regulatory Proposal**

#### **Emissive Equipment Sales Limits**

- 1) Does a gradually decreasing emissive equipment sales limit adequately address regulated entity and end-user challenges? Why or why not?
- 2) If not, what alternative approach do you suggest for achieving California's GHG emission reduction goals that address end user challenges?

#### **Reporting Requirements**

4) Do you have any feedback on proposed reporting requirements?

#### **Credit Flexibility**

- 5) What do you appreciate about the proposed credit system? What are your concerns?
- 6) How could credit values, credit limits, and banking be designed to support a well-functioning credit system?
- 7) How could credit values, credit limits, and banking be designed to support a well-functioning credit system?



## Questions: Public Engagement and Staff Analysis

#### **Implementation Planning:**

7) Feedback on CARB staff implementation planning and interagency coordination?

#### **Staff Analysis:**

- 8) Any overall comments on the methods or results?
- Technology Review:
- 9) Any comments on the technology types, status and current deployment of zeroemission options?
- Equity Analysis:
- 10) What other equity dimensions would you like to see CARB staff analyze and report on?
- Cost Analysis:
- 11) Which energy rate forecast do you recommend CARB use to model the impact of future energy prices?



#### **Public Comments via Zoom**

#### **Online Attendees**

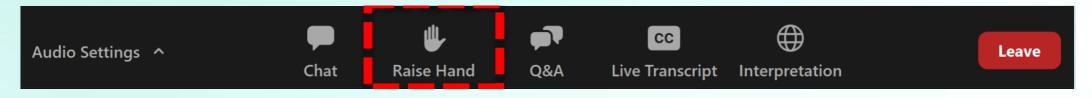
- Use the "Raise Hand" feature in the Zoom toolbar.
- When staff call your name, please "Unmute" yourself by clicking the red button and proceed to introduce yourself.

#### **Phone Attendees**

- Dial \*9 to raise or lower your hand
- Dial \*6 to mute or unmute

#### **Technical Difficulties**

• If you have technical difficulties, please email: buildingdecarb@arb.ca.gov





### Today's Agenda (5 of 5)

- 1) Revised Regulatory Proposal
- 2) Summary of Public Engagement Feedback
- 3) Update on Staff Analysis
  - Summary of How Revised Regulatory Proposal Addresses Feedback and Staff Analysis
- 4) Public Comments
- 5) Next Steps



### **Next Steps**

- Written Comments: submit comments by January 14, 2026:
   Zero Emission Space and Water Heating Public Comments
- **Draft Regulatory Language** shared publicly in first quarter of 2026.
- Economic analysis released in first quarter of 2026.



### **Staying Connected**

• Website: background, including FAQs:

Zero-Emission Space and Water Heater Standards

- **Listserv**: Subscribe to CARB's Building Decarbonization GovDelivery topic to stay informed: <u>Subscribe</u>
- Questions: email <u>buildingdecarb@arb.ca.gov</u>

