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Climate Innovation Program Update

November 2, 2023

Lindsey Fransen, Erik Jensen, and Zack Bradford

Agenda

- Workshop Participation
- Climate Innovation Program Overview
  - Funding and Requirements
  - Timeline
  - Development
- Proposed Objectives
- Questions for Attendees
- Open Question and Comment Period

Workshop Participation

- Workshop is being recorded on Zoom
- The presentation and recording will be posted to https://www.energy.ca.gov/programs-and-topics/programs/climate-innovation-program
- Submit questions and comments in Zoom Q&A
- Submit written comments by November 16 to the Climate Innovation Program Docket, 22-ERDD-02, at https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=22-ERDD-02

Program Overview

Assembly Bill 209 (2022)

Public Resources Code § 25625

Directs the CEC to establish the Climate Innovation Program to fund technological advancements by **CA-headquartered companies** that enable the state to:

- Meet its **GHG reduction targets** and **achieve its climate goals** on an **accelerated timeline** and at a **lower cost**.
- Be **more resilient** to the impacts of climate change.

Program Overview

Assembly Bill 209 (2022)

Public Resources Code § 25625

Mandates a stakeholder-driven process to **identify and prioritize investments** that:

- Provide the **greatest potential benefits** to the state's climate goals.
- Are **not sufficiently addressed** by other funding programs.
- May **leverage and attract significant federal funding** to California.

Program Funding

Budgeted Amount (millions)	Fiscal Year					Total
	22-23	23-24	24-25	25-26	26-27	
2022 Budget Agreement	$100	$100	$100	$225	$0	$525
23-24 Budget Change	-$98	-$100	$0	$0	$150	-$48
New Total	$2	$0	**$100**	**$225**	**$150**	$477

- $477M over 5 years from General Fund
- Up to 10% may be used for program administration
- Funding may take the form of a grant, contract, or other appropriate funding measure

Program Requirements

Eligibility

- Prime awardee must be CA-headquartered company
- Certain other entities can partner but cannot be prime

Repayment Provisions

- Repay award amount if company HQ leaves CA within 10 years of project end
- Repay award amount plus 20% if company experiences a liquidity event within 10 years of project end
- Repayment plans can be arranged with CEC

Program Timeline

Date	Item
Q3 2022	AB 209 (2022)
Q4 2022	Program introduction workshop
Q4 2023	Program update workshop
Q4 2023	Additional workshop(s)
Q1 2024	Initial funding topics finalized
Q3 2024	Initial solicitation(s) posted

November 2022 Workshop Feedback

Broad Interpretation of Climate Technology

- Renewable energy, storage, efficiency, electrification
- Wildfire prevention, regenerative agriculture, bioeconomy
- Software, electronics, and data-related technologies
- Technologies to reduce non-CO_2 GHGs such as methane

Equity Considerations

- Job creation
- Air and water quality benefits

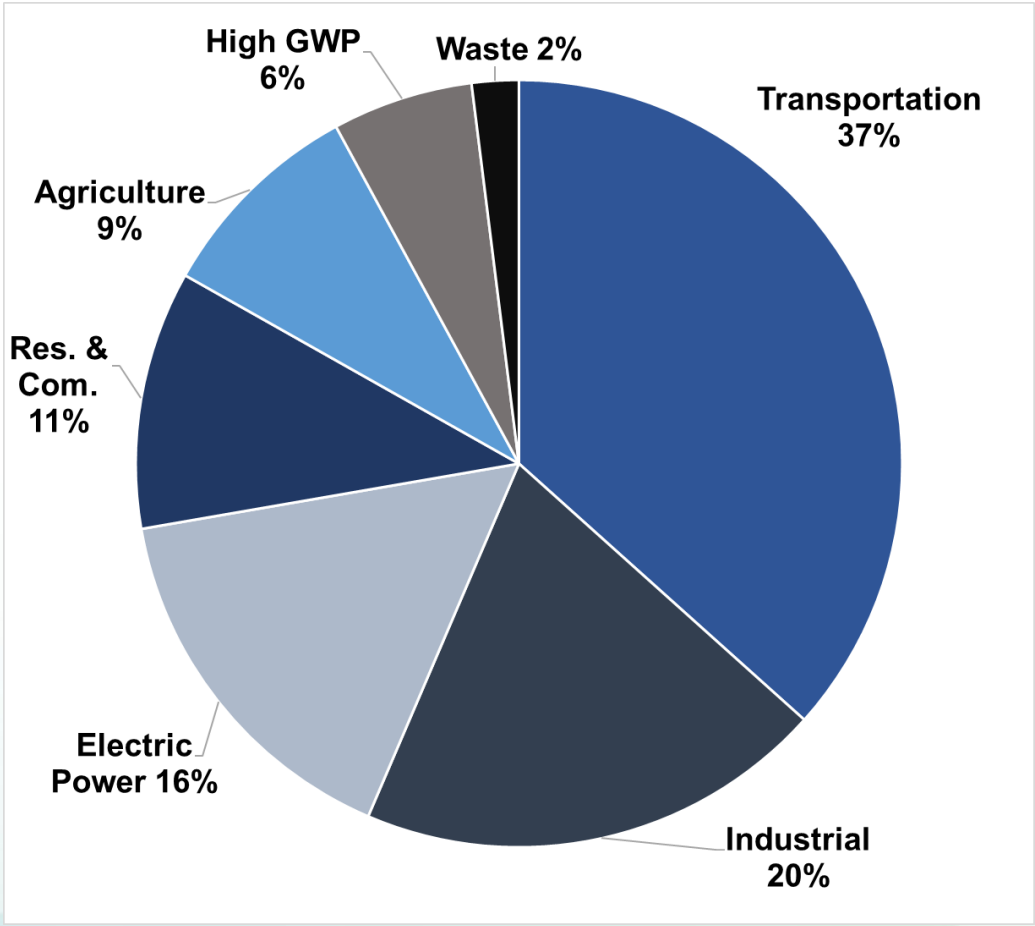
Solicitation Development

- Consider wide range of technology development stages, particularly demonstration projects
- Payback provisions may be a barrier
- Seek subject matter expertise on topics new to CEC

Planning Process

Climate Goals & Strategies Sector Research
Transportation
Buildings
Electricity
Industry
Natural & Working Lands
Short-lived Climate Pollutants
Carbon Capture
Resilience

2020 GHG Emissions



2022 CARB Scoping Plan

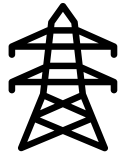
Planning Process

Technology Evaluation Criteria
Reduces GHG emissions
Increases resilience
Accelerates timeline to meet climate goals
Meets climate goals at lower cost
Addresses funding gaps
Leverages federal funding
Benefits frontline communities / priority populations
Provides multiple benefits

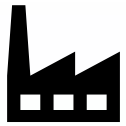
Objectives

Advance and deploy technologies that:

Facilitate **resilient, electrified communities**



Increase **grid reliability**



Reduce, capture, or utilize GHG emissions from **industry**

Protect **forests** from catastrophic wildfire, sequester carbon, and support local economies

Reduce emissions from and increase the resilience of **agriculture**

Resilient Electrified Communities

Objective Goals

- Eliminate GHG emissions from the built environment
- Ensure grid-supportive electrification of buildings and transportation
- Increase the safety, comfort, and convenience of buildings and transportation in the face of climate change

Technology Families

- Buildings
- Transportation

Resilient Electrified Communities

Buildings

- Affordable, retrofit-ready efficiency and electrification technologies such as 120V appliances and building envelope upgrades
- Energy storage and load shifting technologies, including V2X
- Low-GWP refrigerant production and refrigeration management
- Low carbon construction materials such as green cement and mass timber

Image by California Energy Commission.

Resilient Electrified Communities

Transportation

- Technologies that support public transit and active transportation
- EV battery and component manufacturing, swapping, and recycling
- Technologies that facilitate access to reliable charging infrastructure

Image by California Energy Commission.

Grid Reliability

Objective Goals

- Accelerate California's transition towards 100% renewable energy
- Build a resilient grid in the face of extreme climate-related weather
- Maintain a reliable grid as California electrifies

Technology Families

- Energy storage
- Transmission efficiency
- Innovative renewables deployment

Grid Reliability

Energy Storage

- Advanced storage technologies to make full use of renewable energy resources
- Microgrids with storage and vehicle-to-grid technologies for clean, reliable backup power

Image by California Energy Commission.

Grid Reliability

Transmission Efficiency

- Advanced conductors to avoid the need for new energy resources
- Grid enhancing technologies, such as dynamic line rating systems

Image by California Energy Commission.

Grid Reliability

Innovative Renewables Deployment

- Co-location of solar or wind projects on farms, reservoirs, or marginalized lands

Image by California Energy Commission.

Image by California Energy Commission.

Industrial Decarbonization

Objective Goals

- Accelerate decarbonization of heavy industry
- Identify and eliminate sources of short-lived climate pollutants

Technology Families

- Carbon capture and utilization
- Fuel switching
- Methane capture and utilization

Industrial Decarbonization

Carbon Capture and Utilization

- Point Source Capture of CO_2 from oil and gas, cement manufacturing
- CO_2 utilization in industrial processes such as CO_2-curing of cement

Image by California Energy Commission.

Industrial Decarbonization

Fuel Switching

- Technologies that facilitate a switch to sustainable biofuels or clean hydrogen
- Technologies that generate sustainable biofuels onsite for industrial use

Industrial Biodigester, image by California Energy Commission.

Industrial Decarbonization

Methane Detection & Utilization

- Detect methane leaking from abandoned oil and gas fields, pipelines, and other infrastructure
- Technologies that can facilitate using waste methane for energy or value-added products

Image by California Energy Commission.

Healthy Forests

Objective Goals

- Protect communities from catastrophic wildfire
- Sequester carbon in vegetation and soils
- Support local economies

Technology Families

- Wildfire detection and response
- Vegetation management
- Bioeconomy

Healthy Forests

Wildfire Detection & Response

- Remote cameras and artificial intelligence (AI) for wildfire detection
- Drones and software solutions for rapid fire suppression

"Alert Wildfire Camera Detection System" by BLM Oregon & Washington, licensed under CC BY 2.0. (Cropped from original.)

Healthy Forests

Vegetation Management

- Remote sensing tools to monitor vegetation health and guide forest treatment projects
- Technologies to remove or transport forest biomass efficiently and at low cost
- Robotics and AI to help conduct prescribed burns safely and quickly

Healthy Forests

Bioeconomy

- Technologies to generate sustainable biofuels and clean hydrogen
- Technologies to produce value-added products from small-diameter trees
- Technologies to facilitate on-site biomass processing

Image by California Energy Commission.

Resilient Agriculture

Objective Goals

- Help farms become resilient carbon sinks
- Reduce short-lived climate pollutant emissions
- Improve air quality in rural communities

Technology Families

- Biomass and waste reduction and utilization
- Soil health and carbon retention
- Farm and food processing equipment

Resilient Agriculture

Biomass and Waste Reduction & Utilization

- Produce compost, biochar, bedding, and other products from crop residues and manure
- Develop and deploy feed additives to reduce enteric fermentation

Image by California Energy Commission.

Resilient Agriculture

Soil Health & Carbon Retention

- Use compost and biochar to help soil retain carbon, water, and other nutrients
- No-till technologies to prevent soil carbon release
- Precision agriculture technologies (sensors, AI, drones) to promote healthy soils and efficient use of inputs

"Biochar applied to crop fields" by GIZ Bush Control and Biomass Utilisation Project, licensed under CC BY-SA 4.0. (Cropped from original.)

Resilient Agriculture

On-Farm Equipment

- Electric farm vehicles (tractors, trucks) to reduce GHG and particulate emissions
- Energy efficient / electric food processing

Image by California Energy Commission.

Stakeholder Questions

1. Which of the presented objectives or technology families should the CEC prioritize?
2. What are appropriate grant sizes and technology stages the CEC should consider for solicitations?
3. Please indicate any objectives or technology families not presented that the CEC should consider.
4. Are there existing or upcoming federal funding opportunities that the CEC should consider leveraging?
5. How can the CEC ensure that equity is centered within this program?

Break

5 Minute Break

Public Comments

Submitting Written Comments

- E-file comments in Docket # 22-ERDD-02: https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=22-ERDD-02\
- See workshop notice for instructions on submitting comments by mail or email
- Written comments requested by November 16, 2023

Public Comments

- On computer:
  - Use the raise hand feature
  - Unmute yourself when called on
- On phone:
  - *9 – Raise / lower hand
  - *6 – Unmute / mute
- Introduce yourself by stating your name and affiliation
- Please stay under 3 minutes to allow time for others

Stakeholder Questions

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Next Steps

Submit Written Comments

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Next Workshop

- Tentatively scheduled on Forests and Agriculture, mid-December