**Attachment-5**

CALIFORNIA PUBLIC UTILITIES COMMISSION

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ELECTRIC PROGRAM INVESTMENT CHARGE

DRAFT EPIC Strategic Objectives

April 2024

# ACHIEVING 100% NET-ZERO CARBON EMISSIONS AND THE COORDINATED ROLE OF GAS

Initial Draft Strategic Objectives for the Electricity Program Investment Charge ("EPIC") Program for the 2026-2030 Investment Period. These Draft Strategic Objectives were developed by stakeholders participating in the California Public Utility Commission's ("CPUC") in-personal technical working group on April 12, 2024, in response to the process and Strategic Goals established by the CPUC in D.24-03-007.

**How these Draft Strategic Objectives were developed**

The Draft Strategic Objectives were developed through a multi-part process:

1. **Fall 2023: Strategic Goals Process.** The CPUC launched a Strategic Goals process for the EPIC program in August 2023, and facilitated stakeholder workshops to identify the priority state climate, equity, and energy goals that EPIC could work to support, exploring critical pathways to achieving those goals, identifying the obstacles, challenges, and gaps along those pathways, and discussing the key roles of entities responsible for overcoming those gaps. The output from that process was the development of a Staff proposal on Strategic Goals for the EPIC program, filed in November 2023.

2. **March 2024: Strategic Goals Adopted.** In March 2024, the CPUC adopted five strategic goals for the EPIC program in D.24-03-007 (Transportation Electrification, Building Decarbonization, Achieving 100% Net-Zero Carbon Emission and the Coordinated Role of Gas, Distributed Energy Resource Integration, and Climate Adaptation), and directed the establishment of a workshop process to establish Strategic Objectives for the EPIC program.

   Strategic Objectives are clear, measurable, and robust targets to guide EPIC investment plan strategies to scale and deploy innovation to align with EPIC's Strategic Goals that:

   a. Address the key gaps in critical pathways to achieving California's climate goals,

   b. Focus on the unique role ratepayer-funded research, development, and demonstration (RD&D) can play in leading innovation investment, and

   c. Consider important crosscutting principles identified in the decision, including equity, emerging strategies, and safety (including cybersecurity)

3. **March 2024: Strategic Objectives Process Launched.** The Strategic Objectives Workshop process kicked off on March 19, 2024 with a public workshop, and was followed by an April 2, 2024 workshop on developing an Impact Analysis Framework for the EPIC program.

4. **April 2024: Technical Working Group meetings begin.** Technical working groups for each strategic goal launch in April 2024, focused on initial development of Draft Strategic Objectives for the EPIC program.

5. **May - June 2024: Finalize Strategic Objectives for inclusion in CPUC Staff Proposal.** The included Draft Strategic Objectives below will be discussed as part of follow-up virtual technical working group meetings in May 2024, as well as in-person and virtual Workshops in June 2024. The ultimate product of this work is the development of a CPUC Staff Proposal on the Strategic Objectives to be included in a CPUC litigated proceeding.

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# Achieving 100% Net-Zero Carbon Emissions and the Coordinated Role of Gas

**Strategic Goal:** EPIC will seek to identify cost-effective opportunities for reaching the "last 10%" of the state's goal to be carbon neutral by 2045 economy-wide, through investment in California-specific strategies for hard-to-decarbonize energy-consuming sectors that could be decarbonized through electrification and coordination with other California RD&D programs to align investments and activities for emerging strategies, by addressing identified gaps for this goal.

Identified Gaps:

| Identifying Climate and Local Pollutant Impacts of New Generation and Storage Technology | Addressing Intermittency and Increasing Flexibility to Achieve a Carbon-Free Power Sector | Technology Innovation for Hard-to-Decarbonize Processes | Electricity system coordination with gas decommissioning |
|---|---|---|---|
| Lack of information on high production and life-cycle costs of "green" electrolytic hydrogen | Lack of coordination between grid operators in the western region in order to integrate new large-scale renewable resources, including offshore wind | Lack of clear pathways to economically decarbonize 100% of hard-to-decarbonize activities through electrification with no increase in air, water, and land pollutants by 2045 | Lack of a coordinated, statewide program to substitute non-pipeline alternatives for gas system repair and replacement projects where technically feasible |
| Lack of opportunities for disadvantaged, low-income, and ESJ communities and tribes to be readily included in the discussions and decision-making process on emerging generation and storage technology adoption, including discussion of potential impacts on public health | Uncertain impacts from significant changes in energy demand patterns due to electrification | Electrification of high-heat processes creates additional stress on the electric grid locally, and regionally in high-adoption scenarios | Lack of coordination and collaboration among EPIC and other gas and electric RD&D program investments on the common goal of decarbonization and right-sizing energy infrastructure and ratepayer affordability |
| Lack of independent studies on appropriate, cost-effective roles and lifecycle costs and impacts of emerging technologies, including floating OSW, enhanced geothermal, biomass conversion, and clean renewable hydrogen in achieving carbon neutrality | Long timelines for renewable energy, storage, and transmission development may not match timelines for electricity demand changes | | Lack of understanding on the potential to transition entire neighborhoods from gas to geothermal heating and cooling, particularly in warm climates |

## 3.1 Impacts Research for New Generation and Storage Technologies

Strategic Objective: This program will create publicly understood, comprehensive impacts research on new generation and storage technologies (including biomass) with early inclusion of DVC communities.

The Strategic Objective will take into consideration:

- Cumulative impacts
- Other California policies and funding sources;
- Locational findings from other grid needs studies;
- Focusing on knowable impacts and the scariest knowledge gaps;
- Quality of data resulting from the scale of the project;
- Organizational capacity to engage;
- Difficulty identifying who needs what level of data;
- Barriers to assessing others' research; and
- Need for trusted messengers.

The Strategic Objective will achieve a path to market through:

- Showing that impacts research enables adoption of new technologies; and
- Careful choice of communication channels.

The Success for the Strategic Objective will be measured through:

- Greater consensus on what impacts will be from new generation and storage technologies;
- Impacts research projects include early inclusion of community voices;
- Positive feedback from DVC communities on impacts research process;
- Engagement and outreach metrics such as downloads, citations, journal impact factors;
- Quantitative numbers attached to community concerns;
- Communities use language from impact research when discussing new technologies;
- Improved support for some new generation and storage technologies;
- Short summaries and storytelling materials available for all major impact research;
- Third party EM&V plans for EPIC projects;
- Lifecycle impacts assessments completed for each technology or project before construction;
- Whether project staff can discuss projects in away family members can understand;
- Communities identify some metrics from projects that affect their community; and
- Greater trust in CA agencies work and decisions.

**Targeted Questions for Stakeholders:**

- **To what extent is the lack of accessible and trusted research on impacts a barrier to informed support of or opposition to new generation and storage technologies in communities?**
- **What strategies would you suggest to ensure that communities are well-informed on the impacts of new generation and storage technologies?**

- **What role could EPIC play in building a community's capacity and resources to engage in discussions of the impacts of new generation and storage technologies?**
- **Are there particular new generation and storage technologies or kinds of impacts from new generation and storage technologies that communities most want to see information about?**
- **Are there considerations that are not mentioned here that any strategy should keep in mind?**
- **Do you have thoughts on how to bring strategies to market after the EPIC program activities are complete?**
- **Are there other objectives related to identifying climate and local pollution impacts of new generation and storage technologies that are not mentioned here and are important to DVC communities?**

## 3.2 Electricity and Gas System Coordination

Strategic Objective: This program will support the creation and enablement of an electrification strategy which supports the state's overall decarbonization goals by 2035.

The Strategic Objective will take into consideration:

- The  need to prioritize and complete the electrification strategy or roadmap by 2029 to align subsequent strategies, allowing some to commence in tandem;
- There are data inputs and data sources that come from various agencies;
- The work being done in the long term gas planning rulemaking R.20-01-007, and specifically a gas forecast that should be available by 2026 as directed by that rulemaking;
- That work is coordinated and not being duplicated or repeated across stakeholders and agencies;
- Cost effectiveness of the strategy and the impact on rates;
- The need to focus on DVC's so they aren't "stranded" customers;
- It takes a long time to change customer attitudes; and
- Cities and communities often act as champions with customer engagement;

The Strategic Objective will achieve a path to market through:

- Employing uniform assumptions and data inputs for models and forecasts across all stakeholders and agencies; and
- Developing mapping tools to be used by planning agencies and communities to further electrification and decarbonization efforts.

Success for the Strategic Objective will be measured through:

- Number of successful pilots
- Knowing the Number of heat pumps that customers have behind-the-meter
- Customer satisfaction
- Quantification of the tradeoffs to any benefits
- Amount of ratepayer buy-in
- Community participation
- Number of DVC's/tribal/LI participants
- % Visibility of equipment behind-the-meter
- Consistent assumptions being used in models and forecasts across agencies, communities, and utilities

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**Targeted Questions for Stakeholders:**

- **As we aim to support the state's decarbonization goals by 2035 through electrification, what specific, quantifiable targets should we establish for system electrification and gas infrastructure decommissioning? For example, should we aim for X% of the system to be electrified or Y% of outdated gas infrastructure to be decommissioned by specific dates? How**

**can we phrase this objective to include these measurable metrics for clear evaluation of progress and success?**

- **Is this strategic objective an appropriate use of rate-payer funded electric RD&D money?**
- **What specific roles should community-based organizations (CBOs), environmental justice groups (EJs), and disadvantaged communities (DVCs) play in shaping and achieving this strategic objective? How can their input and needs be more effectively integrated into this strategic objective?**
- **What are ways that success and benefits of this Strategic Objective can be measured that are not currently listed?**
- **Do you have thoughts on how to bring strategies to market after the EPIC program activities are complete?**

## 3.3 Alleviate Grid Constraints to Spur Industrial Electrification

Strategic Objective: The program will identify and deploy technologies that alleviate 80% of forecasted grid constraints to be caused by the industrial electrification of GHG emitting high-heat processes by 2033-2035 timeframe.

The Strategic Objective will take into consideration:

- Identify RD&D on electrification solutions in hard-to-abate sectors.
- Prioritization of pilots and demonstration projects based on EPIC cross-cutting goals.
- Consider market oversight.
- Minimize unintended consequences to California's industrial sector and its growth.
- Different outreach and engagement strategies for utilities and the industrial sector.
- Analyze impacts of electrification for industrial subsectors to inform grid needs.
- TEPIC funds deployed to de-risk grid innovation technologies and accelerate adoption.

The Strategic Objective will achieve a path to market through:

- Identification of novel and viable grid solutions to be funded as pilots and demonstration projects (such as aggregated DERs, both demand and supply side solutions, demand load management, long duration energy storage technologies).
- Support market facilitation with commercialization pathways for utility and industrials.
- Utilities and the industrial sector co-investment strategies.
- Pilots of experimental rate structures and/or tariffs.
- Utility aggregation platform for technologies to spur commercial viability.

Success for the Strategic Objective will be measured through:

- Deliver on CPUC EPIC cross-cutting goals.
- GHG emission reductions.
- Grid load alleviation.

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**Targeted Questions for Stakeholders:**

- **What other factors need to be considered to design and implement a successful program?**
- **Are there other actions to facilitate market participation as commercialization pathways?**
- **Are there additional success measures to monitor and track for this program?**

### 3.4 Increase Predictability in the Intermittent Resources and Load Management Modeling and Utilization

Strategic Objective: The program will achieve X% certainty in anticipating seasonal, day ahead and real-time renewable generation, demand profiles & flexible load performance and design signals to support better DER and storage deployment to meet gaps cost-effectively by 2035.

The Strategic Objective will take into consideration:

- Cost-effective resiliency and reliability;
- Chaning demand.

The Strategic Objective will achieve a path to market through:

- Developing data and modeling tools that can be used by the distribution and transmission grid operators and other stakeholders.

Success for the Strategic Objective will be measured through:

- $/bill savings in avoided grid investments;
- Reductions in forecasting errors and mismatch with actual load;
- Changes in the resilience and reliability metrics (established systems reliability metrics, including System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Customer Average Interruption Duration Index (CAIDI));
- ½ reduction in variability between service areas, particularly in DVCs;
- Reduced generation volatility from geographic and technology diversity;
- Reduced risk of loss of load, reduced load shed events.

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**Targeted Questions for Stakeholders:**

- **Is the Strategic Objective appropriately stated? If not, what do you propose?**
- **What measurable targets and timelines would you recommend?**
- **What other factors need to be considered to design and implement this program successfully?**
- **Are there additional success measures to monitor and track for this program?**
- **What is the path to market and likely timelines?**

## 3.5 Maximize Local Benefits of New Transmission

Strategic Objective: The program will design a reliable model to maximize local benefits of new transmission to shorten time to approve transmission & increase community benefits by 2030.

The Strategic Objective will take into consideration:

- Existing rights of way;
- Coordinating with broadband/telecom and existing undergrounding efforts;
- Fire and emergency risks management and planning needs;
- Cost-effective approaches;
- Costs impacts on local communities;
- California goals of conserving 30% of lands and coastal waters by 2030 (30x30).

The Strategic Objective will achieve a path to market through:

- Developing replicable models.

Success for the Strategic Objective will be measured through:

- Increase in the nature-based solutions;
- Cost savings in synergies in transmission maintenance and fire safety;
- Shorter time to approve transmission and related costs savings;
- Increased community benefits from transmission projects;
- Reduction in fire risks;
- Adoption rates of the developed models.

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**Targeted Questions for Stakeholders:**

- **Is the Strategic Objective appropriately stated? If not, what do you propose?**
- **What measurable targets and timelines would you recommend?**
- **What other factors need to be considered to design and implement this program successfully?**
- **Are there additional success measures to monitor and track for this program?**
- **What is the path to market and likely timelines?**

EPIC DRAFT STRATEGIC OBJECTIVES

# APPENDIX

As part of the development of Draft Strategic Objectives in the technical working group meetings, participants provided examples of strategies that may help achieve the Strategic Objective. At this time, it is premature to finalize specific strategies to reach the Strategic Objectives, as that will be determined as part of Administrator Investment Plans. However, capturing the discussed strategies can provide helpful context to participants to understand the focus of the discussion.

The following represents a non-exhaustive list of possible strategies identified by stakeholders for each Strategic Objective. Stakeholders need not provide comments, edits, or suggestions on the identified strategies.

**ACHIEVING 100% NET-ZERO ENERGY CARBON EMISSIONS AND THE COORDINATED ROLE OF GAS**

| Strategic Objectives | Stakeholder-supplied Example Strategies |
|---|---|
| **3.1 Impacts Research for New Generation and Storage Technologies** | • Comprehensive quantification of pollution, public health, workforce, and non-energy impacts of new technologies;<br>• Effectively communicating existing and new data to the public and especially DVC communities;<br>• Using best practice and new dissemination strategies and looking for lessons learned from past efforts;<br>• Researching customer and community needs and priorities and making that information widely available; and<br>• Failing fast and reassigning funding, where needed. |
| **3.2 Electricity and Gas System Coordination** | • Develop forecasting and modeling for the electricity and gas system;<br>• Identify and map aging or vulnerable gas infrastructure suitable for electrification and decarbonization;<br>• Analyze the costs associated with gas system decommissioning under various conditions;<br>• Gain insights into the types of equipment and technologies customers use behind-the-meter;<br>• Determine the most effective ways to communicate electrification and decarbonization to diverse customer segments;<br>• Understand customer behaviors and devise strategies to incentivize the transition from gas to electric;<br>• Implement effective customer engagement and outreach programs; |
| **3.3 Alleviate Grid Constraints to Spur Industrial Electrification** | • Build upon existing utility and ISO/RTO data, studies, and models with GIS mapping.<br>• Quantity grid baseline and forecasted grid needs with GHG and grid constraints.<br>• Identify gaps and barriers to industrial electrification adoption<br>• Prioritize localized industrial sub sectors, climate zones, and grid constrained regions.<br>• Operate with a holistic and integrated California Interagency coordinated approach.<br>• Holistic and integrated California Interagency coordinated effort. |
| **3.4 Increase Predictability in the Intermittent Resources and Load Management Modeling and Utilization** | • Studies to fill the data gaps in visibility and forecasting of DERs and demand/EV charging/flexible load for distribution grid operators and CAISO modeling and forecasting purposes, including on ways to improve dynamic demand forecasting and load balancing potential;<br>• Studies, pilots and demonstrations on the impact and the value of co-locating long-term storage with resilience needs;<br>• Customer behavior studies (for example pricing pilots for V2G and response to prices);<br>• Research and demonstrations into plug-n-play platforms for bidirectional EVs as mobile long-term storage that can be mobilized to fill the needs where necessary. |

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| **3.5 Maximize Local Benefits of New Transmission** | • Coordinating transmission planning with local fire risks management and telecom/broadband and undergrounding efforts to maximize benefits in rural communities (for example, using transmission routes as fire breakers). |

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