CALIFORNIA PUBLIC UTILITIES COMMISSION

ELECTRIC PROGRAM INVESTMENT CHARGE

DRAFT EPIC Strategic Objectives

April 2024

BUILDING DECARBONIZATION

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 11, 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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Building Decarbonization

Strategic Goal: EPIC will invest in the rapid acceleration of comprehensive, cost-effective, and equitable building decarbonization technologies and strategies to help achieve the state's goal to be carbon neutral by 2045 economy-wide, including achieving and sustaining a three percent annual building electrification retrofit rate (3.6 percent for affordable housing) by and beyond 2030, by addressing identified gaps for this goal.

Identified Gaps:

Speeding and Enabling Residential Retrofits	Coordinating at a Community Scale	Understanding and Prioritizing Energy Burden, Improving Air Quality and Building Safety	Flexible Load	Commercial and Industrial Building Retrofits
High upfront costs of electrification retrofits	Increasing share of gas infrastructure costs accruing to those not able to afford electric retrofits	Lack of energy burden, air quality, and safety metrics for building decarbonization efforts	Lack of understanding of customer behavior in technology adoption and demand flexibility	Lack of low-cost automation and sensing solutions for commercial buildings
Lack of whole home retrofit approaches for low-income retrofits	Lack of advanced planning, including city planning, for grid needs	High energy burden levels for low-income customers as compared to national and State averages, and increasing electric rates	Need for advanced modeling and forecasting to better account for demand flexibility potential	Commercial and industrial buildings often have higher energy demand and unique end uses that make electrification and decarbonization more difficult
Inability of renters to make large-scale, permanent upgrades in tenant-occupied buildings, and risks of increased rent burdens and loss of affordable housing	Complex coordination needed to transition entire neighborhoods from gas to decarbonized buildings	Lack of coordinating between decarbonization, energy efficiency, and DER investments lead to higher costs	High cost of grid upgrades associated with new, unmanaged electric load	Split incentives are a barrier to the deployment of energy efficiency and DER measures in buildings
Lack of standardized retrofit packages and difficulty for consumers in coordinating among different decarbonization incentives and financing opportunities to understand how to fit them together to complement each other to reduce decarbonization cost		High costs for health and safety upgrades, mitigation for pre-electrification/pre-weatherization barriers in older existing buildings	Lack of flexible load capacity from building electric use	

Speeding and Enabling Residential Retrofits	Coordinating at a Community Scale	Understanding and Prioritizing Energy Burden, Improving Air Quality and Building Safety	Flexible Load	Commercial and Industrial Building Retrofits
Long lead and installation times for electrification retrofits, in comparison to emergency equipment replacement timeline needs				
Lack of standardization and complex and demanding building codes, permitting, and interconnection processes				
Inability to easily share data across systems needed to plan for, develop, interconnect; and optimize building retrofits				
High cost of panel and wiring upgrades for older residences				

2.1 Whole-Home Electrification Cost Reductions

Strategic Objective: The program will support the achievement of a whole-home electrification cost target reduction of X% reduction by 2035.

The Strategic Objective will take into consideration:

- Space constraints, noise concerns, and the installation process;
- Contractor skills and technological biases;
- Uncertain savings;
- Health and safety issues in homes;
- Operating costs;
- Project phasing;
- Customer values; and
- Distrust in the marketplace.

The Strategic Objective will achieve a path to market through:

- HVAC and water heater contractors double electric sales via manufacturers incentives;
- Updating electrical codes;
- Leveraging trusted messengers; and
- Satisfying all customer values, including comfort, costs, and health.

Success for this Strategic Objective will be measured through:

- DVC community adoption increases by 30% by 2035;
- Equity metrics for multi-family and DVC communities adoption;
- EPIC project cost per ton GHG reduction and estimated GHG reductions if scaled
- Customers have additional technology choices from which to choose.

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose?**
- **For those who own, manage, and live in affordable housing, are there any gaps?**
- **For equipment manufacturers, are there strategies to incorporate new technologies or products to help achieve the strategic objective? What barriers do you see to the development of new technologies or products to address this objective?**
- **What is the path to market and likely timeline for availability of technologies or products?**

2.2 Avoiding Grid Upgrades due to Decarbonization

Strategic Objective: This program will support the achievement of a target of X% of whole-building decarbonization upgrades that require no associated grid upgrades

The Strategic Objective will take into consideration:

- Existing transformer capacity;
- PV hosting capacity.
- Contractor skills and technological biases; and
- Knowledge levels of contractors designing the upgrades.

The Strategic Objective will achieve a path to market through:

- Updating electrical codes; and
- Reducing upgrade costs.

Success for this Strategic Objective will be measured through:

- Avoided costs
- Metrics that differentiate by building type
- Transformer upgrade deferrals vs expectations
- Changes over time in number of homes per transformer
- Peak load reductions on transformers
- No grid upgrades required for ⅓ of CA by 2039

Targeted Questions for Stakeholders:

- **For equipment manufacturers, are there strategies that incorporate new technologies or products that are not discussed here but would help achieve this objective? If not already widely available in the marketplace, what is the path to market and likely timeline for availability of those technologies or products?**

- **For equipment manufacturers, what barriers do you see to the development of new technologies or products to address this objective?**

2.3 Flexible Load

Strategic Objective: Reduce the number of grid upgrades need to support the state's building decarbonization goals by 50% by 2035 through the deployment of flexible building load technologies, with a focus on ensuring equitable deployment of strategies.

The Strategic Objective will take into consideration:

- Prioritizing low-hanging-fruit opportunities and strategies first, aligning with the state's 2030 load flexibility goal;
- Disparities in retrofit levels, particularly in multifamily buildings and among LI/Tribal/DVC communities;
- Other non-building related flexible loads (ex. TE, DER);
- Rapidly changing load shapes;
- Different customer segments have different needs, with a focus on DVC's, and low-income multi tenant customers;
- Varying access to internet and fiber especially in rural communities;
- Affordability of rates and grid upgrades;
- Align with relevant CPUC proceedings on building decarbonization, load management, rate design, etc.; and
- Cybersecurity of communications, controls, and technologies

The Strategic Objective will achieve a path to market through:

- Accurately value real-time load flexibility and shifted loads; and
- Expanding monetization or revenue streams beyond current programs or incentives

Success for the Strategic Objective will be measured through:

- # of customer's enrollment in a load flexibility program
- Cost effective peak load reduction ($/kW)
- $ deferred grid upgrades due to load flexibility

Targeted Questions for Stakeholders:

- **Are there other objectives not mentioned here that are related to increasing equitable deployments of load flexible technologies that are important for your community?**
- **How can we better incorporate the needs and priorities of DVCs into the flexible load strategy to ensure it is both equitable and effective?**
- **What additional ways can and should the success of this Strategic Objective 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?**

2.4 Address Split Incentives in Commercial Multi-Family Buildings

Strategic Objective: The program will address split incentives for commercial multi-family buildings through novel tenant and landlord strategies that develop a roadmap to deploy a portfolio of energy efficiency, electrification, and decarbonization technologies with innovative financing options by 2032.

The Strategic Objective will take into consideration:

- Landlord responsibility to invest in building retrofits to achieve net zero targets
- Measures to avoid landlord pushing costs to tenants (i.e. higher rent, fees)
- Understand consumer behaviors and DVC needs

The Strategic Objective will achieve a path to market through:

- Tenant-centric solutions that are replicable and scalable
- Landlord-focused financing options to accelerate adoption
- Tenant no-cost programs for DVCs and affordable financing options for non-DVCs
- Building owner bill financing strategies to address split incentives

Success for the Strategic Objective will be measured through:

- Prioritize disadvantaged vulnerable communities (DVCs)
- Prioritize climate zones
- Reduce GHG emissions at building sites and surrounding communities
- Evaluate and monitor cost shifts from landlord to tenant, including housing costs
- Embedded measurable and verifiable KPIs
- Participation rate
- Access and equity metrics
- Comfort measures for tenants

Targeted Questions for Stakeholders:

- **What other strategies will address split incentives for commercial multi-family buildings?**
- **What other factors need to be considered in commercial multi-family building net zero retrofits or new construction?**
- **What are other commercial multi-family building solutions to be deployed as pilots?**
- **Are there additional success measures to monitor and track for this program?**

2.5 Accelerate Net Zero Technologies for Commercial and Industrial Buildings

Strategic Objective: The program will accelerate the adoption of energy efficiency, electrification and decarbonization technologies for commercial and industrial buildings resulting in X% reduction in GHG emissions by 2040.

The Strategic Objective will take into consideration:

- Industrial and commercial end-users
- Prioritization of commercial and industrial building sub-sectors
- Prioritization of grid constrained zones and high concentrations for GHG emissions
- Apply a full design approach to minimize energy consumption in achieving net zero
- Energy efficiency standards
- Utility and building owner co-investment strategies for DERs and other technologies
- Distinct pathways for utility and buildings sectors
- Distributed ownership business models
- Integrate with EPIC hard-to-abate sector programs
- Consumer behavior and change management practices

The Strategic Objective will achieve a path to market through:

- Establish eligible investments to be funded as pilots and demonstration projects
- Validation of net zero technologies and financing solutions to spur commercialization
- Layering in novel and viable incentive programs
- Deploy utility incentive programs without comprising equity and affordability
- Framework for commercialization pathways for utilities and building sector

Success for the Strategic Objective will be measured through:

- Reduce GHG emission and improve air quality for workers and communities
- Prioritize disadvantaged vulnerable communities (DVCs)
- Grid peak demand and load management alleviation measures
- Technology performance
- Embedded measurement and verification of KPIs tied to CPUC cross-cutting goals
- Safety
- Quality of Life
- Productivity
- Minimize commercial operational disruptions

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?**

2.6 Community Scale Electrification/Decarbonization

Strategic Objective: The program will achieve a target of X% (or X number) of 100% decarbonized/electrified communities (including new and existing buildings) by 2045 (with earlier targets aligned with the utility 4-year rate case cycles).

The Strategic Objective will take into consideration:

- DVC prioritization for community-scale electrification, particularly in the worst air quality zones;
- Engaging communities in planning and identifying desired solutions;
- Ensuring DVC benefitting from the projects;
- Health and safety issues in homes and DVC prioritization for home improvements;
- Operating costs and life-time savings from avoided upgrades (for example for areas wit decommissioned gas infrastructure);
- Coordinating with existing home upgrades, energy efficiency and other complimentary programs to reduce overall costs;
- Coordinating and prioritizing community-scale projects for fire zones and coordinating with fire and emergency management efforts;
- Customer values and community need;
- Cybersecurity and safety concerns and standards.

The Strategic Objective will achieve a path to market through:

- Developing successful replicable and scalable model approaches to community-scale electrification/decarbonization projects, including successful building retrofits/designs, VPP/V2G/V2B integration and load management/energy exports profiles, models for VPP and DER aggregators;
- Developing tools for aggregating customers into community-scale
- Projects;
- Developing tools to map opportunity areas for community-scale
- Projects;
- Developing VPP/V2B/V2G specific rates tariffs to compensate customers
- (prosumers);
- Updating electrical codes; and
- Reducing upgrade costs.

Success for this Strategic Objective will be measured through:

- Number and X% of 100% electrified/decarbonized communities;
- Number of 100% buildings (or households) electrified/decarbonized;
- Number and X% of buildings with bidirectional EV wiring;
- Savings $/household in electric upgrades in the community-scale projects as compared to single house electrification/decarbonization projects;

- Savings in avoided upgrades to existing gas/electric infrastructure (per household in the targeted electrified community and per household impact on all other ratepayers);
- Overall bill savings to all ratepayers and $/household in the targeted communities;
- Energy and demand reductions in the electrified neighborhoods in a community-scale vs single home/building projects;
- GHG reductions and air quality improvements in the electrified communities;
- EPIC project cost per ton GHG reduction and estimated GHG reductions in community-scale projects vs single home/building projects.

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose?**
- **What measurable targets and timelines would you recommend?**
- **For those who own, manage, and live in affordable housing, are there any gaps?**
- **For gas and electric utilities, building retrofit contractors, EV charging/DER installers and aggregators, are there strategies to incorporate new technologies or products to help achieve the strategic objective? What barriers do you see to the development of new technologies or products to address this objective?**
- **What is the path to market and likely timeline for availability of technologies or products?**

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.

BUILDING DECARBONIZATION

Strategic Objectives	Stakeholder-supplied Example Strategies
2.1 Whole-Home Electrification Cost Reductions	• Validating building decarbonization upgrade approaches; • Characterizing the workforce and housing stock; • Multifamily plug and play solutions; • Whole-home modeling and contractor tools that are reliable and build trust; • Financing; • Controls; • Solar; • Aggregating performance data; • Bi-directional electric vehicles; • Bringing the cost of electric panel retrofits below $1000.
2.2 Avoiding Grid Upgrades due to Decarbonization	• Rooftop solar coupled with bi-directional vehicle charging and electric panel upgrades; • Load management; • Behind-the-meter nano- or micro-grids; and • Energy usage disaggregation.
2.3 Flexible Load	• Advanced modeling and planning tools; • Behind-the-meter technology advancements; • Intelligent communication with customers; • Defer or decrease system upgrades • Understanding different customer segment load potential and behavior; and • Advanced interoperability and automated controls
2.4 Address Split Incentives in Commercial Multi-Family Buildings	• Deployment of pilots for tenant-owned mobile HVAC / energy efficiency units • Pooling of mobile units with tokens to reduce costs and accelerate tenant adoption • Deployment of detachable smart building controls • Novel financing options offered to landlords to accelerate net zero building retrofits • Develop a roadmap tailored to commercial multi-family buildings • Expand existing utility programs for commercial multi-family housing
2.5 Accelerate Net Zero Technologies for Commercial and Industrial Buildings	• Develop a framework to accelerate adoption, reduce costs, and spur commercialization • Deployment of a suite of pilots and demonstration projects for C&I net zero technologies • Establish a data-driven program target for % reduction in GHG emissions by 2035 • Accelerate adoption at a pace needed to achieve California net zero goals

2.6 Community Scale Electrification / Decarbonization	• Identifying best approaches to coordinate/overlay gas and electric infrastructure upgrades and planning:
	  ○ Mapping out and coordinated planning of overlay/intersection of electric and gas infrastructure to identify communities that may be best suited for 100% community-scale electrification (overlaying gas and electric infrastructure and DVC communities to identify most feasible spots where, for example, gas infrastructure requires costly upgrades and it may be most cost effective to transition the community to all electric or geothermal technologies).
	  ○ Developing mapping tools;
	  ○ Developing cost-effective and scalable and replicable pathways (for example, through demonstrations and pilots) for neighborhood scale decarbonization/electrification;
	  ○ Identifying feasible scale/size of a community for cost effective community-scale electrification/decarbonization projects (for example a block, a street, a group of blocks, a neighborhood, a cluster of buildings or customers based on gas/electric meters interconnection with the utility infrastructure);
	  ○ Social behavior research into customer adoption behavior;
	  ○ Developing recommendations for the building code updates related to mandated pre-wiring for all electric neighborhoods;
	  ○ Developing an online platform to identify and cluster customers interested in 100% electrification of their homes to unite them into community scale projects.
	• Identifying best approaches to mandate and coordinate bidirectional EV pre-wiring to achieve X number or X% of buildings/communities with bidirectional pre-wiring by 2045 (with the earlier dates aligned with the code updates timelines):
	  ○ Developing building code update recommendations for mandating bidirectional wiring in buildings to enable bidirectional EV/V2B/V2G interconnection and operability;
	  ○ Developing cost-effective approaches/pathways to leverage VPP/V2G/DER capabilities to reduce costs and increase profitability and affordability of community scale electrification projects (for example through studies, pilots and demonstrations for community scale energy export and

	aggregation capabilities, load and export capabilities of the homes with EVs and DERs); ○ Identifying opportunities for cost savings in various upgrades if performed on community scale, including panel upgrades and bidirectional wiring, neighborhood EV charging planning, DER integration.