CALIFORNIA PUBLIC UTILITIES COMMISSION

ELECTRIC PROGRAM INVESTMENT CHARGE

DRAFT EPIC Strategic Objectives

May 2024

CLIMATE ADAPTATION

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 May 1, 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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Climate Adaptation

Strategic Goal: EPIC Plans will seek to identify cost-effective, targeted research opportunities for improving grid resiliency and stability, particularly for adaptability of and impacts on ESJ and tribal communities during severe weather events, including preventing and mitigating the effects of wildfires, floods, and other climate-driven events; hardening the grid and improving resilience especially in the most remote grid edge locations; reducing the number of customers experiencing long-duration outages; and reducing the duration of these outages, by addressing identified gaps for this goal.

Identified Gaps:

Protecting Vulnerable Populations	Responding to Increased Weather and Climate Variability	Hardening the Grid and improving Resiliency in Remote Grid Edge Locations
Lack of ESJ and tribal communities' access to resiliency infrastructure and resources	Increased risk to grid equipment life expectancy under climate adaptation scenarios, including from stronger winds and increased heat and humidity that prevents the equipment from cooling down at night	Lack of actual and expected performance, health, lifespan, and failures of grid equipment under new climate scenarios increases cost and outage risks
An outsized burden that long-duration outages have on disadvantaged, low-income, and ESJ tribal communities	Lack of comprehensive weather operational data to predict system conditions	High grid restoration times after large-scale outage/PSPS events
Non-weatherized housing stock in DVCs increase health, safety, and affordability risks	Lack of tools to support coordinated planning for the impacts of high-impact widespread, and long-duration climate related events	High cost of grid hardening
		Lack of fail-safe equipment to reduce ignition events

5.1 Accelerate Climate Adaptation in DVC Housing

Strategic Objective: Accelerate and increase scale of climate adaptation in DVC housing.

The Strategic Objective will take into consideration:
- Social burden and health metrics;
- Need for comprehensive program packages;
- Need to act at natural equipment turnover points;
- Undue burden of wildfire impacts on DVCs; and
- Other systemic social impacts on DVCs.

The Strategic Objective will achieve a path to market through:
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Success for the Strategic Objective will be measured through:
- Standard electric system reliability metrics with an overlay of CalEnviroScreen and other geospatial demographic data sources;
- Heat pump and other equipment and shell measure market penetration and absolute number of installations;
- Codes and standards compliance rates;
- Demonstration and deployment projects for high efficiency HVAC systems in DVCs by housing type;
- Distributors' equipment stock measurements; and
- Level of improvement in a community's resilience infrastructure after an event.

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose? And why?**
- **What paths to widespread market adoption do you see for technologies or processes that could further this strategic objective?**
- **What barriers do you see to the development of new technologies or processes to address in this objective?**
- **For community-based organizations and consumer advocates - what ratepayer and DVC concerns should be taken into account?**
- **What are appropriate targets and timelines for the Strategic Objective?**
- **What reporting practices should EPIC mandate to track progress of this strategic objective?**

5.2 Increase Community Engagement and Empowerment

Strategic Objective: Increase the quality of community engagement and co-creation, collaboration, and empowerment opportunities in the process of adapting to climate change.

The Strategic Objective will take into consideration:
- The lack of trust of energy actors among community members.

The Strategic Objective will achieve a path to market through:
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Success for the Strategic Objective will be measured through:
- EPRI's community engagement metrics; and
- Consumer sentiment information and data.

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose? And why?**
- **What paths to widespread market adoption do you see for technologies or processes that could further this strategic objective?**
- **For community-based organizations and consumer advocates - what ratepayer and DVC concerns should be taken into account?**
- **What additional metrics or considerations would community stakeholders recommend?**
- **What are appropriate targets and timelines for the Strategic Objective?**
- **What reporting practices should EPIC mandate to track progress of this strategic objective?**

5.3 Improve Power Restoration Time for Vulnerable Populations

Strategic Objective: Innovative approaches to quick deployment and quick, mobile responses to outages.

The Strategic Objective will take into consideration:
- Distributor's stocking decisions determine equipment availability.

The Strategic Objective will achieve a path to market through:
- Codes and standards.

Success for the Strategic Objective will be measured through:
- Standard electric system reliability metrics with an overlay of CalEnviroScreen and other geospatial demographic data sources,
- Fuel source of available quick grid restoration equipment,
- Number, size, and location of microgrids,
- Number of bidirectional V-G or V-Home systems,
- Mobile battery bank availability and penetration, and
- Distribution-level storage in DVCs.

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose? And why?**
- **What priority paths to widespread market adoption do you see for technologies or processes that could further this strategic objective?**
- **What reporting practices should EPIC mandate to track progress of this strategic objective?**
- **What are appropriate targets and timelines for the Strategic Objective?**

5.4   Grid Hardening for Long-Term Climate Impacts

Strategic Objective: The program will achieve implementation of an optimized capital deployment framework for hardening the grid to long-term climate impacts to achieve increased affordability, reduce outage risk, and reduce social burden, where optimized means cost-effective prioritization of investments using objective, measured, verifiable data on grid equipment condition, capability, and alternatives by 2029-2033.

The Strategic Objective will take into consideration:
- Prioritizing investments that help mitigate multiple hazard impacts;
- Difference in needs around long-term anticipated climate change and acute climate events;
- The increase in cooling and heating extremes add to electricity system grid strain;
- Timing of the next general rate case (GRC) as a goal for larger pilots and deployments of technologies that utilities will demonstrate in EPIC 5;
- CEC's EPIC 5 (2026-2030) investments should be prioritized with accelerated timelines and will inform the utility EPIC 5 projects; and
- Data must be publicly available and easy to understand.

The Strategic Objective will achieve a path to market through:
- Demonstration projects, bigger pilots, and deployments

Success for the Strategic Objective will be measured through:
- Reduction in the number of pieces of infrastructure identified as vulnerable;
- Real-time visibility into 100% of grid assets;
- Reduce O&M costs by X%;
- Long-term projected saving;
- Reduction in repetitive loss;
- Establishing baseline under modeled conditions;
- Trends in PSPS event number and duration;
- Reduction in restoration time;
- CEMI and CELID;
- Quantity and duration changes in outages by region; and
- Demonstrated reduction in social burden (RENCAT).

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose? And why?**
- **How can we best phrase the objective to define (in a measurable way) what 'optimized capital deployment' is?**

- Given the ongoing initiatives at various state agencies, the need for CEC to produce EPIC 5 project results which will inform the utility EPIC 5 projects, the historical timeline for EPIC projects to fund and be completed, and the short period to the next utility GRC's (2027-2031) when EPIC demonstrated projects can be approved to be piloted or deployed, do you foresee the EPIC 5 funding cycle (2026-2030) making a significant impact on achieving this strategic objective?
- What additional paths to widespread market adoption do you see for technologies or processes that could further this strategic objective?
- What reporting practices should EPIC mandate to track progress of this strategic objective?

5.5 Improved Predictions and Forecasting for Increased Weather and Climate Variability

Strategic Objective: By 2028-2030 develop sufficient tools and data and develop a model of California energy system with a shared view of California electric infrastructure (including distribution, transmission and CAISO infrastructure) that will improve modeling and forecasting to minimize load shed events and provide novel solutions to reduce restoration time after the extreme weather events.

The Strategic Objective will take into consideration:
- Affordability (not increasing ratepayer energy burden);
- Data privacy;
- AI and machine learning capabilities;
- Value of California projects that are outside of California that have California ratepayer benefits (for example in the broader WECC region);
- Customer behavior, needs and response to weather events;
- Workforce development needs; and
- Community needs and meeting reliability metrics that address them.

The Strategic Objective will achieve a path to market through:
- Reduced time from model to real life implementation;
- Improvements in resilience and reliability metrics including in the DVCs;
- Number of regulations adopting or mandating developed tools, data and standards.

Success for the Strategic Objective will be measured through:
- Co-developing tools, data and solutions with those who will integrate them;
- Integration into CPUC proceedings;
- Integration into utility planning, forecasting and operations;
- Integration into RTO/ISO planning, forecasting and operations;
- Integration into industry practices;
- Reduced number of interruptions related to climate and extreme weather events;
- Number of after incident assessments;
- Demonstrations (particularly to support entrepreneurs); and
- Data democratization (making data open and available).

Targeted Questions for Stakeholders:

- **Is the Strategic Objective appropriately stated? If not, what do you propose? And why?**
- **What additional paths to widespread market adoption do you see for studies, technologies or processes that could further this strategic objective?**
- **What ratepayer and DVC concerns should be taken into account?**
- **What reporting practices should EPIC mandate to track progress of this strategic objective?**

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.

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Strategic Objectives	Stakeholder-supplied Example Strategies
5.1 Innovative approaches to quick deployment and quick, mobile responses to outages	- Demonstrations to leverage existing infrastructure in new ways - Standard communications processes to help people and organizations work together - Advanced weather data to help communities be prepared for response - Adding resilience at repair - Community and building scale improvements and resilience centers with storage and microgrids
5.2 Accelerate and increase scale of climate adaptation in DVC housing	- Leveraging various sources of funding - New business models for utilities - Adding resilience at the time of repair - Identifying critical infrastructure, in addition to critical facilities - More frequent baselines on housing stock and on sea level impacts - Demonstrations to leverage existing infrastructure in new ways and bring confidence around existing technologies - Design-build strategies and demonstrations - Accelerating the integration of medium- and heavy-duty EVs - Broaden building standards and certifications to include resilience - Entrepreneurial ecosystem support - Community resilience infrastructure
5.3 Increase the quality of community engagement and co-creation, collaboration, and empowerment opportunities	- Partnering with communities that have learned lessons through past events - Identifying most effective community partners - Innovating on ways to engage communities - Tools to share data and stories gathered through outreach and education
5.4 Grid Hardening for Long-Term Climate Impacts	- System failure causation data - Comprehensive grid awareness - Comprehensive multi-jurisdictional transparent information and data sharing - Climate hazard risk modeling tools - Machine learning to categorize and process data - Machine learning to enable real time grid monitoring - Understanding asset health and predictive failures
5.5 Improved Predictions and	Develop reliability metrics that address community needs

Forecasting for Increased Weather and Climate Variability	• Increase situational awareness (for example for wind, heat and cold) with hourly observations and generate data to validate forward looking predictions, for example by
	○ Deploying a number of sensors to collect data
	○ Locating equipment to collect data in the locations where data is missing or insufficient
	• Develop guidance/studies on the predictions and forecasting best practices
	• Develop novel grid enhancing technologies and novel technologies for decision making, planning and forecasting
	• Develop training approaches and guidance on how to use climate and weather data uncertainties inherent in that data
	• Develop cost-benefit analysis of wildfire mitigation strategies
	• Develop approached to utilize AI and machine learning to improve forecasts and climate predictions to integrate into operations
	• Enhance cause attributions for failures
	• Develop tools and approaches, platforms and portals for coordination, access, navigation and consolidation of existing data from different sources, for example:
	○ A shared coordinated data from IOUs, POUs, CAISO, CEC, WECC, other publicly available data
	○ Creating tools for pulling data from various resources and making it available and accessible
	○ Integrating data on outages, grid planning, load forecasting, customer usage and customer behavior and response to climate events and market signals, various climate data and models, DER operations and performance data, infrastructure digital twin simulations
	• Developing foundational research on climate predictions and forecasting to supplement existing research and fill gaps with more up-to-date information