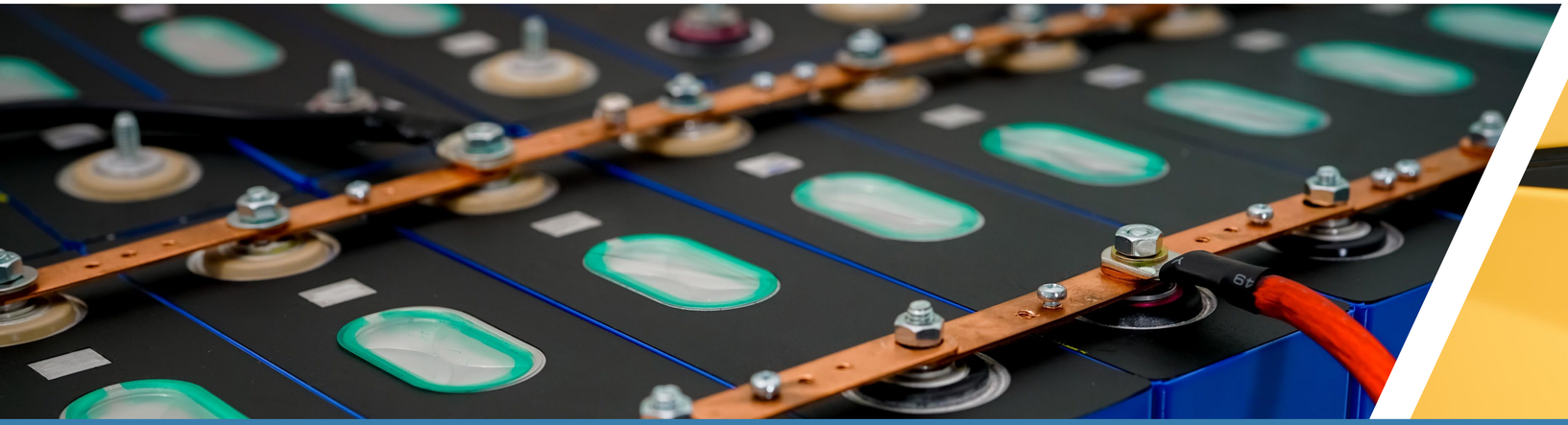
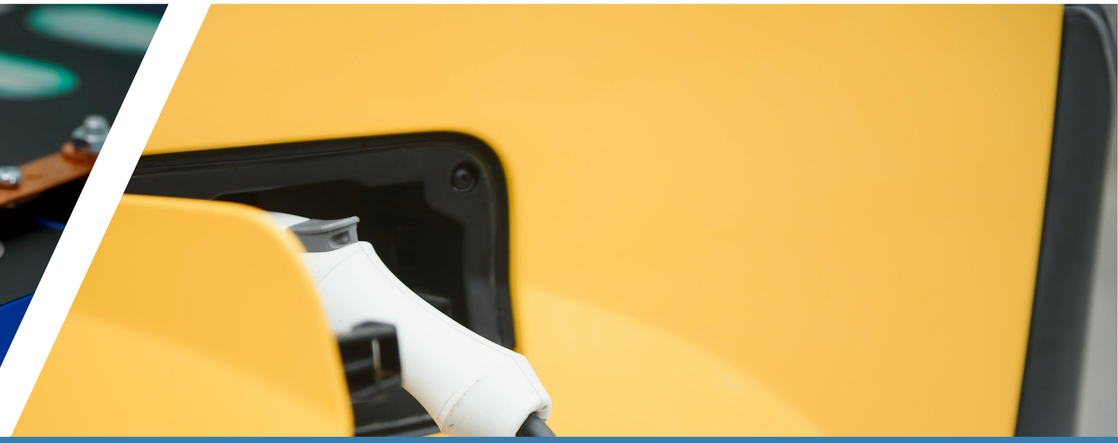
EPIC STRATEGIC OBJECTIVES WORKSHOP PROCESS

Wrap-Up Workshop – July 9 2024





This program is funded by California utility customers under the auspices of the California Public Utilities Commission

CALIFORNIA PUBLIC UTILITIES COMMISSION

Wrap-Up Workshop

July 9, 2024

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I. Welcome and Agenda Overview
II. Opening Remarks
III. Background and Review of the Process
IV. Presentation of Revised Strategic Objectives: Transportation Electrification, Building Decarbonization
V. Stakeholder Discussion and Q&A
VI. Lunch (~12:20 – 1:35 PM)
VII. Presentation of Revised Strategic Objectives: DER Integration, Climate Adaptation, Achieving 100%
VIII. Stakeholder Discussion and Q&A
IX. Break (~2:45 PM)
X. Presentation of Revised Strategic Objectives: grid planning and operations, address multiple goals
XI. Stakeholder Discussion and Q&A
XII. Wrap-Up and Next Steps

STRATEGIC OBJECTIVES SUPPORT EPIC STRATEGIC GOALS (D.24-03-007)

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Transportation Electrification	The Electric Program Investment Charge (EPIC) Program will invest in research, development, and demonstration (RD&D) that supports the planning, integration, scaling, and commercialization of innovation that promotes the state's climate goals to: (1) transition all medium- and heavy-duty vehicles in the state to zero-emission vehicles (ZEV) by 2045; (2) realize 100 percent ZEV in-state new car sales by 2035; and (3) significantly reduce pollution from the transportation sector in disadvantaged, low-income, Environmental and Social Justice (ESJ), and tribal communities, and Environmental Protection Agency non-attainment air districts as soon as possible, by addressing identified gaps for this goal.
Building Decarbonization	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.
Achieving 100% Net-Zero Carbon Emissions and The Coordinated Role Of Gas	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.
DER Integration	EPIC will invest in the cost-effective integration of high penetrations of distributed energy resources to support the state's goal to achieve a renewable and zero-carbon power sector by 2045, in part by building on the state's goal to deploy 7,000 megawatts of flexible load by 2030, by addressing identified gaps for this goal.
Climate Adaptation	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 resiliency 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.

Technical Working Group Workplan

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Kick-Off

Review CPUC Strategic Goals

Identify priority Gaps from Fall 2023 Workshops

Impact Analysis Framework

Identify methods for measuring success and impact

In-Person Technical Working Groups

Collaborative effort to develop draft strategic objectives based on prioritized gaps

Virtual Technical Working Groups

Stakeholder feedback and comment on draft Strategic Objectives

Post-Workshop Comments

Stakeholder written comments on draft Strategic Objectives due June 21

EPIC STRATEGIC OBJECTIVES PROCESS SCHEDULE

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Working Group Meeting	When	Where
Impact Analysis Framework and Metrics Kickoff	April 2, 2024	Virtual workshop
Transportation Electrification #1	April 10, 2024	In-Person: CPUC Offices San Francisco
Building Decarbonization #1	April 11, 2024	In-Person: CPUC Offices San Francisco
Achieving 100% Net-Zero Carbon Emissions... #1	April 12, 2024	In-Person: CPUC Offices San Francisco
Distributed Energy Resource Integration #1	April 30, 2024	In-Person: San Diego Foundation
Climate Adaptation #1	May 1, 2024	In-Person: San Diego Foundation
Transportation Electrification #2	May 13, 2024	Virtual Technical Working Group
Building Decarbonization #2	May 14, 2024	Virtual Technical Working Group
Achieving 100% Net-Zero Carbon Emissions... #2	May 15, 2024	Virtual Technical Working Group
Distributed Energy Resource Integration #2	May 29, 2024	Virtual Technical Working Group
Climate Adaptation #2	May 29, 2024	Virtual Technical Working Group
Wrap-Up Workshop	**July 2024**	**Hybrid Workshop**

KEY GUIDANCE

- **Consolidate** related and duplicate Strategic Objectives.
- Focus to ensure **significant impact**
- Address and overcome key **innovation gaps.**
- Establish clear, measurable and robust **quantitative targets.**
- Allow Strategic Objectives to cover **multiple goals.**
- Allow Strategic Objectives to focus on EPIC's role in **scaling and facilitating deployment**, not fully reaching the target itself.
- Narrow Strategic Objectives to **funding gaps** related to EPIC's unique role.
- Identify key areas with **DVC-specific needs**.
- Also ensure **equity**-focused strategies and impacts are incorporated in all.

KEY GUIDANCE (cont.)

- Identify areas where there is clear **ratepayer benefit.**
- Incorporate **emerging strategies** as appropriate**.**
- Identify **safety (including cybersecurity)** considerations as appropriate.
- Reduce and **focus metrics** on key outcomes from Strategic Objectives.

EPIC Strategic Objectives Wrap-Up Workshop

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REVISED STRATEGIC OBJECTIVES

Strategic Objectives (First Group)

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(A) Reducing M/HDV Charging Infrastructure Costs

The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment that support the reduction of the cost of medium- and heavy-duty charging infrastructure installations, associated grid upgrades, and/or the total cost of ownership by a target of 50% by 2035.

(B) Overcoming barriers to EV benefits in DVCs

The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment to overcome obstacles to equitable transportation electrification benefits (including alleviation of pollution, bridging transportation access, and addressing energy burden) in disadvantaged and vulnerable communities, low-income communities, and non-attainment air districts.

(D) Reducing cost of whole-home electrification

The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment that help reduce the all-in cost of whole-home electrification for single-family and multi-family buildings by 50%, while decreasing residents' energy costs, by 2035.

(E) Innovative Approaches for Difficult-to-Decarbonize Sectors

The EPIC program will accelerate innovative approaches, strategies, and business models to achieve lifecycle cost-parity for difficult-to-decarbonize commercial and industrial buildings and processes, with a specific focus on strategies that lead to the reduction of NOx, PM, and other surface-level pollutants impacting Disadvantaged and Vulnerable Communities.

(F) Community-Scale Decarbonization

The EPIC Program will demonstrate technology, deployment strategies, planning approaches and businesses models for achieving 100% neighborhood- or community-scale electrification at cost-parity or on a cost-beneficial basis on a coordinated timeline with long-term gas planning activities at the CPUC, with a prioritization on addressing needs and obstacles of Disadvantaged and Vulnerable Communities.

Strategic Objectives (Second Group)

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(G) Impacts research for new generation and storage

The EPIC Program will support the development of transparent and publicly-understandable lifecycle analyses of emerging generation, storage, and related technologies and strategies, focusing on assessing economic, land, air, water, net energy, health and safety impacts on communities directly or indirectly affected, through comprehensive and replicable processes involving multiple stakeholders and opportunities for community engagement and evaluation of research focus and outputs.

(H) Increase predictability of weather, intermittent resources, and load

By 2030, the EPIC Program will help achieve measurable reductions in climate-related risk to utility infrastructure through the development of open climate data, analytics, and technologies that a) improve electricity supply and demand forecasts, b) improve the ability to predict risks of extreme, climate-driven weather events to utility infrastructure, c) improve coordination between weather observation, forecasting, and grid operations, and d) inform and coordinate with utility systems planning, operations, and investment decisions.

(I) Leveraging DERs for Grid and Community Resiliency

The EPIC Program will support technology development, innovative deployment models, and real-world testing and evaluation for the demonstration of the use of clean distributed energy resources to reduce the impact of outage events, through strategies that make outages invisible to critical loads and that reduce power restoration time for vulnerable populations, with a specific focus on solving challenges related to critical loads identified by Disadvantaged and Vulnerable Communities as critical community resilience needs.

(J) Expediting and Streamlining Interconnection and Permitting

The EPIC Program will accelerate the development, testing, and integration of innovative technology, communication protocols, and modeling approaches to streamlining interconnection and permitting processes for DER and Electric Vehicle Charging Infrastructure, with a goal to demonstrate the capability to perform same-day interconnection and permitting approval under multiple high DER penetration and electrification scenarios, and a priority for addressing challenges in Disadvantaged and Vulnerable Communities.

(M) Cost-effective grid hardening for long-term climate impacts

By 2029-2033, the EPIC program will develop and demonstrate tools and frameworks that improve long-term planning and achieve more cost-effective capital investments for grid hardening for long-term climate impacts, with a focus on increasing affordability, reducing outage risk, and reducing social burdens of outages.

Strategic Objectives (Third Group)

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(C) Smart systemwide planning tools for new load

The EPIC program will support the development, integration, and updating of grid planning tools that a) substantially increase the forecasting and predictability of intermittent resources, electric vehicles, building electrification, flexible load, and distributed energy resources, b) coordinate with utility capital planning processes, and c) integrate into utility operations for the enablement of grid services and dynamic operation, with the goal of reducing ratepayer costs over time and ensuring Disadvantaged and Vulnerable Communities are not left behind in benefits from the transition to zero-emission technologies.

(K) Providing data input into a Value of DER Framework

In coordination with relevant CPUC proceedings, the EPIC Program will conduct analysis, coordination, and real-world demonstrations that can support the development and ongoing update of an evidence-based framework for the location-, time-, and performance-based values of grid services that are a) usable by grid operators to reduce costs to ratepayers and expand opportunities for distributed zero-emission technologies, b) accessible by any DER, electric vehicle, or flexible load, and c) include appropriate baselines.

(L) Reducing feeder/circuit peaks

To support ratepayer affordability, the EPIC Program will accelerate innovation, demonstration, and deployment of innovative and replicable methods to increase the utilization rate of a circuit and reduce circuit and feeder peak loads, in order to avoid or defer costly grid upgrades, through the coordination of DERs, EVs, flexible load, and grid intelligence, with a focus on circuits serving Disadvantaged and Vulnerable Communities where increased adoption of zero-emission technologies can increase equitable benefits.

EPIC Strategic Objectives Wrap-Up Workshop

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REVISED STRATEGIC OBJECTIVES:

Topics generally related to

the Transportation Electrification and

Building Decarbonization Strategic Goals

(A) Reducing M/HDV Charging Infrastructure Costs

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment that support the reduction of the cost of medium- and heavy-duty charging infrastructure installations, associated grid upgrades, and/or the total cost of ownership by a target of 50% by 2035.

WILL TAKE INTO CONSIDERATION:

- The need to establish a baseline that appropriately reflects the anticipated price trends in EV charging infrastructure installations through 2035;
- Coordination with existing and planned EV charging infrastructure incentives, relevant CPUC proceedings on Transportation Electrification;
- The need to prioritize strategies serving people in Disadvantaged Vulnerable Communities due to the disproportionate impacts of medium- and heavy-duty trucks on these communities;
- Enabling VGI use cases to reduce costs and/or increase the value proposition for the user or owner;
- Innovations to improve cybersecurity or reduce the costs of ensuring secure communications and operations;
- Reductions in soft costs due to delays and long installation timelines; and
- Supply chain dependability and availability.

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Developing successful replicable and scalable model approaches and cost-effective pathways; and
- Incorporating lessons learned into utility EV charging programs, CPUC proceedings, and other planning;

SUCCESS WILL BE MEASURED THROUGH:

- Reduction in charging infrastructure installation times, disaggregated by DVC.
- GHG and air pollution reduction in the targeted DVC communities and elsewhere (to identify any air quality impacts elsewhere);
- $/bill savings for ratepayers in avoided infrastructure investments; and

(B) Overcoming barriers to EV benefits in DVCs

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment to overcome obstacles to equitable transportation electrification benefits (including alleviation of pollution, bridging transportation access, and addressing energy burden) in disadvantaged and vulnerable communities, low-income communities, and non-attainment air districts.

WILL TAKE INTO CONSIDERATION:

- Older housing stock and an increased need for community resilience in DVCs;
- Lack of data on use-cases in disadvantaged, low-income, and Tribal communities, and the need to build trust within communities;
- Differing community needs and desired benefits or outcomes of EV adoption;
- Deferred maintenance and lower capacity on the electric grid in DVCs; and
- Coordination with CPUC proceedings related to VGI and Transportation Electrification;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Demonstrating new approaches to serving DVCs, and documenting best practices in charging at multifamily housing;
- Demonstrating value of EV charging and VGI to DVC communities; and
- Incorporating lessons learned into building codes and standards.

SUCCESS WILL BE MEASURED THROUGH:

- The annual rate of new EV Charging infrastructure installation in DVC communities, in comparison to the system as a whole;
- Reduction in household energy burden for targeted DVC populations;
- Improvement in air quality metrics (NOx, PM 2.5, PM10);
- Number and MW of customers in DVCs participating in VGI use cases;

(D) Reducing cost of whole-home electrification

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC program will accelerate innovation, demonstration, and innovative approaches to deployment that help reduce the all-in cost of whole-home electrification for single-family and multi-family buildings by 50%, while decreasing residents' energy costs, by 2035.

WILL TAKE INTO CONSIDERATION:

- The lack of market-ready, affordable solutions designed to meet the needs of multi-family, rental, low-income, affordable, and DVC housing;
- The higher need and gaps faced by residents in DVCs, including existing conditions, space constraints, health and safety issues, distrust in the marketplace, capital gaps, split incentives with landlords, and lack of access to federal tax credits;
- The role of financing, including the lack of equitable financing options for DVCs and renters, in covering capital gaps and ensuring long-term energy cost reductions;
- The critical role of contractors and obstacles to adoption, including skills gaps, technological biases, and access to products;
- The need to ensure protections for tenants (higher rents, fees) in rental housing;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Coordination with HVAC, water heater, and other appliance contractors;
- Updating electrical codes;
- Leveraging trusted messengers to communicate successful outcomes, addressing issues such as customer values, comfort, costs, and health;
- Identifying tenant-centric solutions that are replicable and scalable, including no-cost and affordable financing pathways;
- Landlord-focused financing options to accelerate adoption and address split incentives;

SUCCESS WILL BE MEASURED THROUGH:

- Modeled and Real-World all-in costs of whole-home electrification, with attribution by use, and disaggregated by community/region;
- DVC community adoption increases in electrification by 30% by 2035;
- Equity metrics for multi-family and DVC communities adoption;

(E) Innovative Approaches for Difficult-to-Decarbonize Sectors

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC program will accelerate innovative approaches, strategies, and business models to achieve lifecycle cost-parity for difficult-to-decarbonize commercial and industrial buildings and processes, with a specific focus on strategies that lead to the reduction of NOx, PM, and other surface-level pollutants impacting Disadvantaged and Vulnerable Communities.

WILL TAKE INTO CONSIDERATION:

- Prioritization of emission reductions for industries impacting Disadvantaged and Vulnerable Communities;
- Coordination with the Smart Systemwide Planning Tools for New Load Strategic Objective to address the impacts of electrification for industrial processes and implications on the grid;
- Change management for difficult-to-decarbonize sectors and processes;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Validation of net zero technologies and financing solutions to spur commercialization;
- Utilities and the industrial sector co-investment strategies;

SUCCESS WILL BE MEASURED THROUGH:

- Cost metric improvements, analyzed by process decarbonization category;
- Reduced GHG emission and improved air quality for workers and surrounding communities for funded projects, and for similar projects at scale;

(F) Community-Scale Decarbonization

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC Program will demonstrate technology, deployment strategies, planning approaches and businesses models for achieving 100% neighborhood- or community-scale electrification at cost-parity or on a cost-beneficial basis on a coordinated timeline with long-term gas planning activities at the CPUC, with a prioritization on addressing needs and obstacles of Disadvantaged and Vulnerable Communities.

WILL TAKE INTO CONSIDERATION:

- Prioritization of DVCs, lowest air quality zones, and fire zones for community-scale electrification;
- The need to proactively engage and fund communities for planning and identifying desired solutions;
- Existing conditions, including health and safety issues as an obstacle to home improvements;
- Focusing on models to identify and prioritize communities that can achieve savings from avoided upgrades to gas infrastructure;
- Opportunities to develop an electrification strategy and/or roadmap by 2029 to inform strategic approach.
- Coordination with CPUC proceedings related to Electric and Gas General Rate cases, long-term gas planning (R.20-01-007), DERs, VGI and Transportation Electrification, Building Electrification, and Climate Adaptation;
- Coordinating with existing home upgrades, energy efficiency and other complimentary programs to reduce overall costs;

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

SUCCESS WILL BE MEASURED THROUGH:

- Number of, total customers within, change in electricity demand, change in gas demand, and total energy/gas/fuel BTU served by 100% electrified/decarbonized communities;
- Savings ($/household) in total energy costs for participants in neighborhood- or community-scale electrification (and % improvement in energy burden);
- Customer satisfaction;
- Savings in avoided upgrades to existing gas/electric infrastructure (per household in the targeted electrified community and per household impact on all other ratepayers); and
- GHG reductions and air quality improvements in the electrified communities;

Strategic Objectives

CALIFORNIA PUBLIC UTILITIES COMMISSION

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(F) Community-Scale Decarbonization

The EPIC Program will demonstrate technology, deployment strategies, planning approaches and businesses models for achieving 100% neighborhood- or community-scale electrification at cost-parity or on a cost-beneficial basis on a coordinated timeline with long-term gas planning activities at the CPUC, with a prioritization on addressing needs and obstacles of Disadvantaged and Vulnerable Communities.

EPIC Strategic Objectives Wrap-Up Workshop

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STAKEHOLDER DISCUSSION

EPIC Strategic Objectives Wrap-Up Workshop

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Lunch

EPIC Strategic Objectives Wrap-Up Workshop

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REVISED STRATEGIC OBJECTIVES:

Topics generally related to

the DER Integration, Climate Adaptation, and

Achieving 100% Net-Zero Carbon Emissions and the

Coordinated Role of Gas Strategic Goals

(G) Impacts research for new generation and storage

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC Program will support the development of transparent and publicly-understandable lifecycle analyses of emerging generation, storage, and related technologies and strategies, focusing on assessing economic, land, air, water, net energy, health and safety impacts on communities directly or indirectly affected, through comprehensive and replicable processes involving multiple stakeholders and opportunities for community engagement and evaluation of research focus and outputs.

WILL TAKE INTO CONSIDERATION:

- The need to invite community input and avoid one-way education from utilities and energy companies;
- A lack of trust of energy system actors, and the need for tools to validate and verify industry research and map information to community concerns;
- Analysis must include cumulative impacts, and incorporate locational findings from other grid needs studies;
- A lack of organizational capacity from community members and groups to engage, and the difficulty in identifying who needs what level of data;
- A thoughtful approach to asking and answering questions is needed to ensure that unintended consequences are avoided.

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Co-creation of projects (beyond EPIC) with communities that address community concerns and leverage impacts research in design and consideration;

SUCCESS WILL BE MEASURED THROUGH:

- Increased understanding of risks and knowledge gaps of new generation and storage technologies, measured in impacted or targeted communities, including the use of language from impact research when discussing new technologies;
- Number of projects proactively engaging community groups and members in active dialogue;
- Short summaries and storytelling materials available for all major impact research;
- Lifecycle impacts assessments completed for each technology or project before or during community consultation;

(H) Increase predictability of weather, intermittent resources, and load

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: By 2030, the EPIC Program will help achieve measurable reductions in climate-related risk to utility infrastructure through the development of open climate data, analytics, and technologies that a) improve electricity supply and demand forecasts, b) improve the ability to predict risks of extreme, climate-driven weather events to utility infrastructure, c) improve coordination between weather observation, forecasting, and grid operations, and d) inform and coordinate with utility systems planning, operations, and investment decisions.

WILL TAKE INTO CONSIDERATION:

- New loads, load types, and capabilities due to electrification;
- The increase in cooling and heating extremes and the impacts these have on technology performance;
- Disparate modeling work and need for better coordination and transparency across researchers, utilities, industry, communities, and regulators, while protecting data privacy;
- Projects that are outside of California and that have California ratepayer benefits (for example in the broader WECC region);
- Customer behavior and needs in responding to weather events;
- Coordination with the Supporting Cost-Effective Decision-making on Grid Hardening for Long-Term Climate Impacts Strategic Objective; and
- Coordination with CPUC proceedings and other state agency efforts related to Climate Adaptation, grid planning, wildfire mitigation, safety, and other relevant activities.

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; and
- Developing accurate and consistent data inputs into planning models and tools that will be integrated into CPUC proceedings, utility planning and forecasting, RTO/ISO planning and forecasting, and industry.

SUCCESS WILL BE MEASURED THROUGH:

- 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));
- Reduction in variability between service areas, particularly in DVCs;
- Reduced risk of loss of load, reduced load shed events; and
- Data democratization (making data open and available).

(I) Leveraging DERs for Grid and Community Resiliency

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC Program will support technology development, innovative deployment models, and real-world testing and evaluation for the demonstration of the use of clean distributed energy resources to reduce the impact of outage events, through strategies that make outages invisible to critical loads and that reduce power restoration time for vulnerable populations, with a specific focus on solving challenges related to critical loads identified by Disadvantaged and Vulnerable Communities as critical community resilience needs.

WILL TAKE INTO CONSIDERATION:

- The outsized burden that long duration outages have on DVCs, that communities have varying threats and climate risks;
- Critical load must be identified by and will be unique to individual communities, and that critical load not just be critical facilities, but communities have limited bandwidth to engage in this identification;
- Capacity limits of existing grid infrastructure can and has limited DER adoption, and can be prevalent in Disadvantaged and Vulnerable Communities;
- The identification of the value of DER benefits during normal operations will be achieved through the Value of DER Strategic Objective, but can be coordinated with this Strategic Objective;
- Already existing incentives and programs such as tax credits, or the utility community microgrid program;
- Coordination with existing incentives and programs, CPUC proceedings, and processes such as the infrastructure deferral framework.

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Development of a phased, real-world testing environment(s) for leveraging DERs for grid and community resiliency;
- Replicable and scalable models to make outages invisible for critical loads across various communities; and
- Coordination of an information exchange on how to optimize resiliency investments for communities, developers, and utilities.

SUCCESS WILL BE MEASURED THROUGH:

- Number of strategies able to successfully demonstrate ability to ride-through, recover quickly from, or otherwise mitigate outage events, the MW load served by such strategies, and duration load was served;
- Individual project success can be tracked through the number of outages mitigated,
- Duration (hours) of outages mitigated; the percent of load and DERs identified as critical load that maintains during outage events; MW of emitting backup generation replaced with zero-emission DERs; and the value of associated outages through the Interruption Cost Estimate (ICE) Calculator 2.0;
- Cost of solution implementation (for project and at scale), before and after-tax credits and incentives;
- The number of circuits that are proactively addressed;
- Operational and cost effectiveness of front of the meter (FTM) and behind the meter (BTM) solutions; and
- Social Burden Metric - Sandia's Resilient Node Cluster Analysis Tool (ReNCAT) (or other novel and/or in-development metrics).

(J) Expediting and Streamlining Interconnection and Permitting

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC Program will accelerate the development, testing, and integration of innovative technology, communication protocols, and modeling approaches to streamlining interconnection and permitting processes for DER and Electric Vehicle Charging Infrastructure, with a goal to demonstrate the capability to perform same-day interconnection and permitting approval under multiple high DER penetration and electrification scenarios, and a priority for addressing challenges in Disadvantaged and Vulnerable Communities.

WILL TAKE INTO CONSIDERATION:

- Capacity limits of existing grid infrastructure can and has limited DER adoption, and can be prevalent in Disadvantaged and Vulnerable Communities;
- There are multiple factors that impact energization timelines, and different locations, grid circuits, regions, and technologies may require different approaches;
- Local jurisdictions are at different starting places for permitting, and different challenges and resources for making adjustments;
- The need for cost-effective solutions to ensure affordability for ratepayers and to reduce costs on DER resource owners;
- The rule of state agencies, regulators, and standards-making bodies in establishing standards, safety, communications, and cybersecurity protocols;
- Coordination with existing resources on the grid; and
- The rapid pace of technology change, as compared to the slower pace of infrastructure change.
- Coordination with CPUC's energization proceeding, and other relevant processes.

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Streamlined DER and EV Charging Infrastructure interconnection processes through standardization and transparent utility tools;
- Standardized streamlined DER and EV Charging Infrastructure permitting process, strategies, and tools available for local jurisdiction adoption;
- Number of products (DERs, inverters, grid devices) available on the market in line with the best industry standards, standards unification.

SUCCESS WILL BE MEASURED THROUGH:

- % decrease in interconnection timelines;
- % of DERs and EVs interconnected with expedited timelines;
- Reduced costs & interconnection timelines for the interconnection customers and utilities, including a reduced gap between estimates vs actual;

(M) Cost-effective grid hardening for long-term climate impacts

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: By 2029-2033, the EPIC program will develop and demonstrate tools and frameworks that improve long-term planning and achieve more cost-effective capital investments for grid hardening for long-term climate impacts, with a focus on increasing affordability, reducing outage risk, and reducing social burdens of outages.

WILL TAKE INTO CONSIDERATION:

- The development of an optimized capital deployment framework would be developed and adopted within other CPUC processes, but would leverage EPIC investments aligned with this Strategic Objective to source data and real-world case studies;
- The need for tools to make cost-effective prioritization of investments using objective, measured, and verifiable data on grid equipment conditions, capability, and alternatives;
- Prioritization of strategies designed to address risks, burden, and impacts in DVCs, to ensure reliability and affordability are preserved or improved in communities more vulnerable to climate impacts and outages;
- Prioritizing investments that help mitigate multiple hazard impacts, including recognizing the difference in needs around long-term anticipated climate change and acute climate events;
- The increase in cooling and heating extremes add to electric 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.

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Demonstration projects, bigger pilots, and deployments; and
- Incorporation of data and lessons learned into an optimized capital deployment framework.

SUCCESS WILL BE MEASURED THROUGH:

- Reduction in the number of pieces of infrastructure identified as vulnerable;
- Change in capital costs for projects/circuits, and extrapolated at scale;
- Change in O&M costs for projects, and extrapolated at scale;
- Changes in repetitive loss metrics (for projects and extrapolated at scale);
- Using baselines developed under modeled conditions;
- Change in restoration time metrics, including Customers Experiencing Long Interruption Duration (CELID);
- Changes in frequency and duration of outages (for projects and extrapolated at scale), such as SAIDI, SAIFI, and Customers Experiencing Multiple Interruptions (CEMI); disaggregated by community type; and
- Demonstrated reduction in social burden (ReNCAT).

Strategic Objectives

CALIFORNIA PUBLIC UTILITIES COMMISSION

(G) Impacts research for new generation and storage

The EPIC Program will support the development of transparent and publicly-understandable lifecycle analyses of emerging generation, storage, and related technologies and strategies, focusing on assessing economic, land, air, water, net energy, health and safety impacts on communities directly or indirectly affected, through comprehensive and replicable processes involving multiple stakeholders and opportunities for community engagement and evaluation of research focus and outputs.

(H) Increase predictability of weather, intermittent resources, and load

By 2030, the EPIC Program will help achieve measurable reductions in climate-related risk to utility infrastructure through the development of open climate data, analytics, and technologies that a) improve electricity supply and demand forecasts, b) improve the ability to predict risks of extreme, climate-driven weather events to utility infrastructure, c) improve coordination between weather observation, forecasting, and grid operations, and d) inform and coordinate with utility systems planning, operations, and investment decisions.

(I) Leveraging DERs for Grid and Community Resiliency

The EPIC Program will support technology development, innovative deployment models, and real-world testing and evaluation for the demonstration of the use of clean distributed energy resources to reduce the impact of outage events, through strategies that make outages invisible to critical loads and that reduce power restoration time for vulnerable populations, with a specific focus on solving challenges related to critical loads identified by Disadvantaged and Vulnerable Communities as critical community resilience needs.

(J) Expediting and Streamlining Interconnection and Permitting

The EPIC Program will accelerate the development, testing, and integration of innovative technology, communication protocols, and modeling approaches to streamlining interconnection and permitting processes for DER and Electric Vehicle Charging Infrastructure, with a goal to demonstrate the capability to perform same-day interconnection and permitting approval under multiple high DER penetration and electrification scenarios, and a priority for addressing challenges in Disadvantaged and Vulnerable Communities.

(M) Cost-effective grid hardening for long-term climate impacts

By 2029-2033, the EPIC program will develop and demonstrate tools and frameworks that improve long-term planning and achieve more cost-effective capital investments for grid hardening for long-term climate impacts, with a focus on increasing affordability, reducing outage risk, and reducing social burdens of outages.

EPIC Strategic Objectives Wrap-Up Workshop

CALIFORNIA PUBLIC UTILITIES COMMISSION

REVISED STRATEGIC OBJECTIVES:

Topics generally related to

grid planning and operations and

that address multiple Strategic Goals

EPIC Strategic Objectives Wrap-Up Workshop

CALIFORNIA PUBLIC UTILITIES COMMISSION

STAKEHOLDER DISCUSSION

EPIC Strategic Objectives Wrap-Up Workshop

CALIFORNIA PUBLIC UTILITIES COMMISSION

15-Minute Break

(C) Smart systemwide planning tools for new load

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: The EPIC program will support the development, integration, and updating of grid planning tools that a) substantially increase the forecasting and predictability of intermittent resources, electric vehicles, building electrification, flexible load, and distributed energy resources, b) coordinate with utility capital planning processes, and c) integrate into utility operations for the enablement of grid services and dynamic operation, with the goal of reducing ratepayer costs over time and ensuring Disadvantaged and Vulnerable Communities are not left behind in benefits from the transition to zero-emission technologies.

WILL TAKE INTO CONSIDERATION:

- New load growth, including from electrification, that have new load shapes, characteristics, reliability and resilience needs, and capabilities for flexibilities;
- Capabilities and opportunities to leverage existing infrastructure and equipment, rather than replacement;
- Differing needs of customers segments and communities;
- Present and future needs around cybersecurity of communication, controls, and technologies;
- The need to increase affordability of rates by reducing the need for grid upgrades;
- Coordination with CPUC proceedings related to DERs, VGI and Transportation Electrification, Building Electrification, Climate Adaptation, and General Rate Cases;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Developing data and modeling tools that can be used by the distribution and transmission grid operators, communities, and other stakeholders; and
- Deployment of pilots and demonstration projects as replicable and scalable models.

SUCCESS WILL BE MEASURED THROUGH:

- Avoided costs for the project demonstrations, and assessment of avoided costs if deployed at scale, including transformer upgrade deferrals vs expectations;
- Peak load reduction on transformers;
- Reductions in forecasting errors and mismatch with actual load;
- Track locational changes in established resilience and reliability metrics, including System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Customer Average Interruption Duration Index (CAIDI);

(K) Providing data input into a Value of DER Framework

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: In coordination with relevant CPUC proceedings, the EPIC Program will conduct analysis, coordination, and real-world demonstrations that can support the development and ongoing update of an evidence-based framework for the location-, time-, and performance-based values of grid services that are a) usable by grid operators to reduce costs to ratepayers and expand opportunities for distributed zero-emission technologies, b) accessible by any DER, electric vehicle, or flexible load, and c) include appropriate baselines.

WILL TAKE INTO CONSIDERATION:

- Relevant CPUC proceedings and existing or planned incentive programs, including those related to transportation electrification, load management, rate design, DERs, and other relevant topics;
- Different methods for engaging DERs, EVs, and flexible load to provide those services to enable adoption, including behavioral (e.g., rates), constraint management (e.g., markets), control, and other mechanisms;
- Constraints, conflicts, and competing and preferred use cases of DERs, EVs, and flexible load depending on other needs during normal operating conditions and in grid emergencies;
- The need to establish and update standardized baselines;
- Risks, costs, and remedies for underperformance;
- Cybersecurity needs of the end-to-end communication systems;
- Lower DER, EV, and flexible load adoption levels, higher retrofit costs, lower access to broadband, and low trust levels in Disadvantaged and Vulnerable Communities, the need for equitable participation in benefits, and differing community needs;
- The need to create a feedback loop to system- and statewide planning processes;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Providing data and results into CPUC proceedings and processes on DERs, EVs, flexible load, rate cases, and other relevant topics;
- Creating cybersecurity requirements to enable secure DER, EV, and flexible load capabilities; and
- Achieving demonstration and deployment through a staged test-bed process.

SUCCESS WILL BE MEASURED THROUGH:

- Whether a standard procedure to evaluate DER, EVs, flexible load grid services, benefits, and baselines has been established;
- A public checklist review of grid services that are valued and accessible to DERs;
- A quantification of the contribution of different market segments to the 7,000 MW flexibility goal;
- Quantification of avoided capacity (and associated cost) of new grid upgrades;
- Overall tracking: carbon intensity of supply for each load hour, percentage of capacity served by DER capacity;
- # of customer's enrollment in load flexibility programs statewide;
- Cost effective peak load reduction ($/kW); and
- $/value of deferred grid upgrades due to load flexibility.

(L) Reducing feeder/circuit peaks

CALIFORNIA PUBLIC UTILITIES COMMISSION

Strategic Objective: To support ratepayer affordability, the EPIC Program will accelerate innovation, demonstration, and deployment of innovative and replicable methods to increase the utilization rate of a circuit and reduce circuit and feeder peak loads, in order to avoid or defer costly grid upgrades, through the coordination of DERs, EVs, flexible load, and grid intelligence, with a focus on circuits serving Disadvantaged and Vulnerable Communities where increased adoption of zero-emission technologies can increase equitable benefits.

WILL TAKE INTO CONSIDERATION:

- Existing conditions, such as existing transformer capacity, PV hosting capacity, and other existing resources;
- The lack of, and need for, granular data at the circuit level;
- The need to root an operational capability to actively manage feeder/circuit peaks with long-term planning and capital planning processes;
- Need to maintain grid performance and reliability and understand electric usage behaviors and community needs at the local level; and
- Coordination with Calfuse pilots, CPUC proceedings, and utility processes;

WILL ACHIEVE A PATH TO MARKET THROUGH:

- Demonstration of capability in a staged test bed process.
- Deploying through utility processes as an alternative to capacity expansion planning; and
- Coordination with long-term planning processes (IEPR, IRP, Resource Adequacy);

SUCCESS WILL BE MEASURED THROUGH:

- Avoided upgrade costs, on a per project basis, and extrapolated if deployed at scale;
- Transformer upgrade deferrals vs expectations;
- Changes in load factor for demonstrations projects;
- Increases in flexible load capacity as a percent of peak power (grid-wide and locally);
- Reduction in DER capacity-limited feeders/circuits;
- Adoption of a planning model to compare leveraging DERs to a grid upgrade; and
- Perception of DVCs of whether they feel well-positioned to participate in and benefit from grid upgrades and additional DER integration activities.

Strategic Objectives

CALIFORNIA PUBLIC UTILITIES COMMISSION

(C) Smart systemwide planning tools for new load

The EPIC program will support the development, integration, and updating of grid planning tools that a) substantially increase the forecasting and predictability of intermittent resources, electric vehicles, building electrification, flexible load, and distributed energy resources, b) coordinate with utility capital planning processes, and c) integrate into utility operations for the enablement of grid services and dynamic operation, with the goal of reducing ratepayer costs over time and ensuring Disadvantaged and Vulnerable Communities are not left behind in benefits from the transition to zero-emission technologies.

(K) Providing data input into a Value of DER Framework

In coordination with relevant CPUC proceedings, the EPIC Program will conduct analysis, coordination, and real-world demonstrations that can support the development and ongoing update of an evidence-based framework for the location-, time-, and performance-based values of grid services that are a) usable by grid operators to reduce costs to ratepayers and expand opportunities for distributed zero-emission technologies, b) accessible by any DER, electric vehicle, or flexible load, and c) include appropriate baselines.

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EPIC Strategic Objectives Wrap-Up Workshop

CALIFORNIA PUBLIC UTILITIES COMMISSION

STAKEHOLDER DISCUSSION

EPIC Strategic Objectives Wrap-Up Workshop

CALIFORNIA PUBLIC UTILITIES COMMISSION

10-Minute Break