

**DOCKETED**

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# Joint IOU EPIC 4 Presentation to DAC Advisory Group

August 19, 2022



# Agenda



- Overview of IOU role as EPIC administrators
- Overview of EPIC 4 cycle
- Discussion of benefits IOU EPIC programs can provide to DACs
- Overview of candidate IOU EPIC 4 topics, with emphasis on most relevant topics to DACs
- Open Discussion
  - Discussion of technology innovation priorities for DACs
  - What's missing from IOU EPIC 4 topics?
  - How should we best solicit broader DAC input in the upcoming EPIC 4 DAC workshop on 8/25?

# EPIC Overview



**The Electric Program Investment Charge (EPIC) is a California statewide program that enables Utilities and CEC to invest in & pursue new/novel emerging energy solutions to meet California's energy goals & drive innovation in the industry**

**EPIC promotes building the energy network of tomorrow through innovation focused on**

**Increased Safety • Improved Affordability • Greater Reliability  
Environmental Sustainability • Equity**

# CPUC-Designated EPIC Work Categories



Applied Research and Development	Technology Demonstration & Deployment	Market Facilitation
<p>Investment in <b>applied energy science and technology</b> that provides public benefit but for which there is no current deployment of private capital.</p>	<p>Investments in technology demonstrations at real-world scales and in real-world conditions to showcase emerging innovations and increase technology commercialization.</p>	<p>Investments in market research, regulatory permitting and streamlining, and workforce development activities to address non-price barriers to clean technology adoption.</p>
CEC	CEC	CEC
	PG&E SCE SDG&E	

# Other Constraints on IOU EPIC Projects



EPIC provides the IOUs with flexibility to demonstrate a wide range of emerging technologies.

CPUC-designated constraints state that IOU EPIC projects **cannot** be the following:

- Only Energy Efficiency or Only Demand Response
- Only Power Generation
- Only Gas
- Paper studies (i.e., without lab or field demonstration)
- Broad deployments of commercially available/already proven technologies
- Unnecessarily duplicative of other technology demonstrations

# EPIC-4 Funding Allocations for Project Work



<b>Administrator</b>	<b>Funding for 5-Year EPIC-4 Cycle</b>	<b>Share of Total (%)</b>
CEC	\$662,300,000	80.00
PG&E	\$82,953,075	10.02
SCE	\$68,051,325	8.22
SDG&E	\$14,570,600	1.76

# EPIC-4 Implementation Process



<b>Sequence of Activity</b>	<b>Date</b>
IOUs file EPIC-4 applications with CPUC	October 1, 2022
CPUC review of applications	Schedule depends on duration of CPUC process
CPUC modifications requested	Schedule depends on duration of CPUC process
Final versions of applications approved	Schedule depends on duration of CPUC process
Funding release by CPUC	Schedule depends on duration of CPUC process
IOUs begin implementation of projects	T + 3 Months
Project plans written and internal teams formed	T + 6 Months
External partners and contract resources	T + 9 Months



# How IOU Programs Can Benefit DACs



	Benefit Area	Past / Current EPIC Project Examples
A.	Safety	<ul style="list-style-type: none"> <li>Improvements to weather &amp; fire danger models to help <b>prevent wildfire ignitions</b></li> </ul>
A.	Reliability / Resiliency	<ul style="list-style-type: none"> <li>Innovative protection schemes for substation transformers to <b>prevent broad power outages</b></li> </ul>
A. Benefits to All Customers	Environmental	<ul style="list-style-type: none"> <li>Demonstrations that inform industry standards for Smart Inverters to <b>enable clean generation integration</b></li> </ul>
A.	Economic	<ul style="list-style-type: none"> <li>Using drones for more efficient inspections to <b>reduce operating costs which lower customer bills</b></li> </ul>
B.	Safety	<ul style="list-style-type: none"> <li>Local deployment of hardware to rapidly de-energize power lines in wire-down events, to <b>improve community safety</b></li> </ul>
B. Benefits to Specific Communities / Customers	Reliability / Resiliency	<ul style="list-style-type: none"> <li>Local installation of devices to proactively address power quality issues, to <b>keep agricultural equipment operating</b> in the San Joaquin Valley</li> <li>Local installation of multi-customer microgrids to <b>keep a community's critical facilities powered</b> during an outage</li> </ul>
B.	Environmental	<ul style="list-style-type: none"> <li>Local public transit fleet electrification to <b>improve air quality</b></li> </ul>
B.	Economic	<ul style="list-style-type: none"> <li><b>Lowering customer ownership costs</b> of Distributed Energy Resource, such as through:                             <ul style="list-style-type: none"> <li>Innovations that allow for reduced interconnection costs</li> <li>New communication system that reduces the cost of complying with CPUC data-sharing requirements</li> </ul> </li> </ul>

# Candidate IOU EPIC 4 Topics



## Strategic Objective: Create a More Nimble Grid to Maintain Reliability as California Transition to 100% Clean Energy

- PG&E
  - Clean, Dispatchable Resources
    - **Microgrid Enablement** → *Potential community-level resilience hubs of critical facilities*
    - **Individual Customer Resiliency** → *Potential assets for individual customers to improve reliability/resiliency*
    - Long-Duration Energy Storage
  - Grid Modernization
    - Sensing and Communication
    - Grid Scenario Planning
    - Advanced Drone Applications
    - Advanced Predictive Maintenance and Failure Cause Analysis
    - Work Management
    - System Protection

# Candidate IOU EPIC 4 Topics



## Strategic Objective: Create a More Nimble Grid to Maintain Reliability as California Transition to 100% Clean Energy

- SCE
  - T&D Foundational Technologies
    - **Adaptive Protection** – *help enable customer choice and support greater system resiliency*
    - Ubiquitous Situational awareness
    - Ultra low-latency communications
  - T&D Situational Capabilities
    - High capacity throughput
    - **Seamless grid flexibility** – *offer better community level solutions that address specific needs*

# Candidate IOU EPIC 4 Topics



## **Strategic Objective: Create a More Nimble Grid to Maintain Reliability as California Transition to 100% Clean Energy**

- SDG&E
  - Grid Reliability
    - **Mobile Microgrid Demonstration** → *Resiliency method for local communities which power critical facilities*

# Candidate IOU EPIC 4 Topics



## Strategic Objective: Increase the Value Proposition of Distributed Energy Resources to Customers and the Grid

- PG&E
  - Distributed Energy Resource Integration and Load Flexibility
    - **Interconnection Enablement** → *Solutions to avoid costly upgrades & streamline connection of renewables*
    - **Advanced Distribution Powerflow Management** → *Use cases to maximize value of customer DERs, and compensate them for their energy export*
  - Transportation Electrification
    - **EV Technology Development and Standardization** → *Opportunities to provide community with central charging hub*
    - **EV Battery Re-Use for Stationary Energy Storage** → *Potential to buy back aging EV batteries from customers for 2<sup>nd</sup>-life grid demonstrations*

# Candidate IOU EPIC 4 Topics



## Strategic Objective: Increase the Value Proposition of Distributed Energy Resources to Customers and the Grid

- SCE
  - Energy Management Foundational Technologies
    - **Localized & edge control** – *individualize local system responsiveness to customer need*
    - Inertia substation
    - **Customer load flexibility** – *improve coordination with customer programs that will broaden participation in savings and quality*
  - Energy Management Situational Capabilities
    - Bidirectional power flow
    - Energy buffering
    - **Islanding & reconfigurability** – *isolate or reduce effect to customers from grid level disturbances*

# Candidate IOU EPIC 4 Topics



## Strategic Objective: Increase the Value Proposition of Distributed Energy Resources to Customers and the Grid

- SDG&E
  - Transportation Electrification
    - **Displacing a diesel-powered rail line with electrification** → *lowering local emissions and improving air quality*
  - Distributed Energy Resource Integration
    - Optimizing Real Time Net Energy Metering (NEM) Hosting Capacity
    - Demonstrating Solutions for Inverter Integration Issues
    - Communication and Control for Advanced Distribution Systems

# Candidate IOU EPIC 4 Topics



## **Strategic Objective: Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate-Resilient and Meets Environmental Goals**

- PG&E
  - Climate and Environment
    - Carbon Capture and Re-Use
    - Individual Customer Emissions Visibility
    - Preventing Faults from Causing Ignitions
    - Undergrounding Capabilities
    - Improved Inspection Capabilities
    - Pinpointing Fault Location
    - Risk Modeling Improvements
    - Crowdsourcing
    - Non-Wildfire Disaster Prevention



# Candidate IOU EPIC 4 Topics



## Strategic Objective: Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate-Resilient and Meets Environmental Goals

- SCE
  - Vulnerability, Threats, and Hazard Reduction
    - **Hardening & remediation** – *reduce climate related effects that significantly impact regions with greater vulnerability*
    - **Safety & work methods advancement** – *improve worker and public exposure to hazards and potential dangers*
  - Digital Transformation
    - End-to-end advanced simulation & analytics
    - Data driven operations

# Candidate IOU EPIC 4 Topics



**Strategic Objective: Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate-Resilient and Meets Environmental Goals**

- SDG&E: nothing identified at this time

# Summary: Potential Opportunities in EPIC 4 Topics



EPIC 4 Topic Area	Potential Opportunities for DACs
<b>Microgrid Enablement</b>	<i>Potential community-level resilience hubs of critical facilities in DACs</i>
<b>Individual Customer Resiliency</b>	<i>Potential assets for individual customers to improve reliability/resiliency</i>
<b>Interconnection Enablement</b>	<i>Solutions to avoid costly upgrades &amp; streamline connection of renewables</i>
<b>Advanced Distribution Powerflow Management</b>	<i>Use cases to maximize value of customer DERs, and compensate them for their energy export</i>
<b>EV Technology Development and Standardization</b>	<i>Opportunities to provide community with central charging hub</i>
<b>EV Battery Re-Use for Stationary Energy Storage</b>	<i>Potential to buy back aging EV batteries from customers for 2<sup>nd</sup>-life grid demonstrations</i>
<b>Adaptive Protection</b>	<i>Help enable customer choice and support greater system resiliency</i>
<b>Seamless grid flexibility</b>	<i>Offer better community level solutions that address specific needs</i>
<b>Localized &amp; edge control</b>	<i>Individualize local system responsiveness to customer need</i>
<b>Customer load flexibility</b>	<i>Improve coordination with customer programs that will broaden participation in savings and quality</i>
<b>Islanding &amp; reconfigurability</b>	<i>Isolate or reduce effect to customers from grid level disturbances</i>
<b>Hardening &amp; remediation</b>	<i>Reduce climate related effects that significantly impact regions with greater vulnerability</i>
<b>Safety &amp; work methods advancement</b>	<i>Improve worker and public exposure to hazards and potential dangers</i>
<b>Mobile Microgrid Demonstration</b>	<i>Resiliency method for local communities which power critical facilities</i>
<b>Displacing a diesel-powered rail line with electrification</b>	<i>Lowering local emissions and improving air quality</i>

# Open Discussion



- Do you see opportunities in the highlighted EPIC 4 topics?
- Are there technology innovation areas of relevance / importance to DACs not covered in our EPIC 4 topics?
- How should we best solicit broader DAC input in the upcoming EPIC 4 DAC workshop on 8/25?

# Resources



## Contacts

Dan Gilani – PG&E EPIC Lead: [Dan.Gilani@pge.com](mailto:Dan.Gilani@pge.com)

Aaron Renfro – SCE EPIC Lead: [Aaron.Renfro@SCE.com](mailto:Aaron.Renfro@SCE.com)

Stacy Fuhrer – SDG&E EPIC Lead: [SFuhrer@sdge.com](mailto:SFuhrer@sdge.com)

## Web Resources

[PG&E EPIC Website](#)

[SCE EPIC Website](#)

[SDG&E EPIC Website](#)

[Joint EPIC Database](#)

# DAC / CBO Outreach for June Workshop



- The Utilities made an announcement at the DACAG Meeting.

Additionally please see the DAC/CBOs the Utilities reached out to in advance of the Joint EPIC DAC Workshop:

- Valley Clean Air Now (Valley CAN)
- Fresno EOC
- Community Housing Opportunities Corp
- GRID Alternatives North Valley
- Acterra
- Veterans in Business (VIB) Network
- Self-Help Enterprises (SHE)
- California Department of Rehabilitation
- Fruition Sustainability Solutions
- City of Salinas
- Modern Backyard
- Energy Vault
- Yale University, Undergraduate Consulting Group
- Central California Environmental Justice Network
- Natural Resources Defense Council
- Clean Tech Dan Diego
- The Energy Coalition
- University of California, Irvine
- Bay Area Council
- Humboldt State University
- East Bay Community Energy
- Green Hydrogen Coalition