

Safety and Security Orientation

Everyone and everything is always safe

Assign safety roles if in person

Psychological Safety

- 
- Practice transparency and vulnerability
 - Avoid blame; learn from mistakes
 - Show care and appreciation
 - Invite new ideas from all
 - Disagree respectfully and with curiosity
 - Prioritize mental health by encouraging self-care



Fire

- Exits, escape routes, evacuation
- Fire ext.



Earthquake

- Drop, cover, hold



Medical Emergency

- 911/share location
- First aid/CPR
- AED



Security: 1-800-691-0410

- Active shooter—get out, hide out, take out, call out
- Maintain situational awareness to mitigate hazards



Ergonomics

- Proper ergo
- 30/30: move 30 secs every 30 min



Start When Safe

- Are you physically and mentally able to work?

 Don't report to work if testing positive for COVID-19 or have cold/flu-like symptoms 

Reminders

1. This is a long workshop. Please be aware of ergonomic risks and risks associated with sitting for long periods of time.

2025 Annual Joint Utilities' EPIC Workshop



July 15, 2025

9am – 3pm

PG&E Oakland General Office



This program is funded by California utility customers under the auspices of the CPUC.



Dan Gilani

Director of Innovation Strategy & Programs





EPIC Overview

The **Electric Program Investment Charge (EPIC)** is a California statewide program that enables the IOUs and CEC to demonstrate and pursue new, novel emerging energy solutions to benefit electric ratepayers and support California's energy goals.

This program is funded by California utility customers under the auspices of the CPUC.





Commissioner Karen Douglas

CPUC Commissioner



Today's Agenda

Start Time	Session
9:00 am	Welcome & Introductions
9:20 am	Panel Discussion 1: Fires, Forests, and Futures: Cross-Sector Collaboration for Climate Adaptation <i>Joined by Blue Forest, Sierra Business Council, California Energy Commission, and PG&E. Moderated by Electric Power Research Institute (EPRI).</i>
10:10 am	EPIC Project Showcase 1
10:40 am	Panel Discussion 2: Driving Change: Technological Advances in Transportation Electrification and DER Integration <i>Joined by California Energy Commission, Southern California Edison, Rivian and WeaveGrid. Moderated by EPRI.</i>
11:30 am	EPIC Project Showcase 2
12:00 pm	Lunch Intermission
1:00 pm	Panel Discussion 3: Zero Emissions Journey: Decarbonizing Buildings and Gas Synergy <i>Joined by City of Oakland, California Institute for Energy and Environment (CIEE), California Energy Commission, and PG&E. Moderated by EPRI.</i>
1:50 pm	EPIC Project Showcase 3
2:20 pm	Feedback & Future Engagement
2:45 pm	Close

Fires, Forests & Futures: Cross-Sector Collaboration for Climate Adaptation



Eknath Vittal (Moderator)

Technical Executive
Electric Power Research Institute (EPRI)



Dave O'Connor

Innovation Strategy & Programs
Pacific Gas & Electric (PG&E)



Jill Horing, PhD

Energy Resilience Specialist
Research and Development Division
California Energy Commission



Kaeleigh Reynolds

Project Manager
Sierra Business Council



Nick Wobbrock

Co-Founder and Chief Conservation
Officer
Blue Forest



PG&E Wildfire-Related EPIC Projects

EPIC 3.47



Operational Vegetation Management Efficiency

Test novel on-site equipment to process vegetation in the field

Potential Benefits

- Affordability: Increasing operational efficiency
- Safety: Reducing wildfire risk

EPIC 4.18



Rapid Wildfire Suppression

Demonstrate new wildfire detection and suppression technologies

Potential Benefits

- Affordability: Avoid wildfire-related impacts
- Safety: Reducing wildfire risk

EPIC 4.19



Woody Supply Chain

Explore novel business models for establishing collaborative, regional wood value chains

Potential Benefits

- Affordability: Increasing operational efficiency
- Strengthen local economic development

EPIC Wood Management Innovations as Driver of Cost-Effective Wildfire Resilience

Innovations in wood management improves the business case for wildfire resilience investment (from PG&E and other wildfire stakeholders) to more rapidly improve public safety.

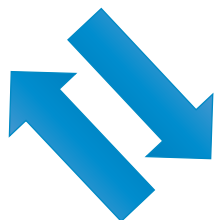
WILDFIRE RESILIENCE (MUTUALLY REINFORCING) ACTIVITIES

Community Wildfire Resilience

Benefits include: Community safety, property defense, property value enhancement, insurance attainability, reduced energy costs

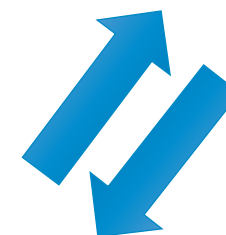
Forest Health Restoration

Benefits include: Ecosystem health, GHGs, smoke pollution, water, avoided suppression, biodiversity preservation, rural jobs, reduced energy costs



Wood Mgmt & Conversion

Benefits include: Reduced costs for energy and wildfire resilience and forestry, carbon removal, fossil fuel displacement, high-quality rural jobs





EPIC-4 Project: Power Quality & Smoke Detection Camera Integration

Mike Colburn – Lead Subject Matter Expert

Project Outcomes & Benefits

Integration of Power Quality (PQ), Early Fault Detection (EFD), satellite smoke detection, and smoke detection cameras **support a more nimble grid** and increase **public safety** and **reliability** through **advanced intelligence** and **accelerated findings**

EPIC Alignment and Utility Benefits

- **Advances technology management**, expanding SDG&E's communication intelligence
- Informs location and precursor to **assist with real-time findings**
- **Reduces undetermined causes** of faults and apply appropriate mitigations
- **Reduces troubleshooting costs** and outage times, and potential advanced restoration
- Potential for **earlier estimation of system involvement**

Community & Customer Benefits

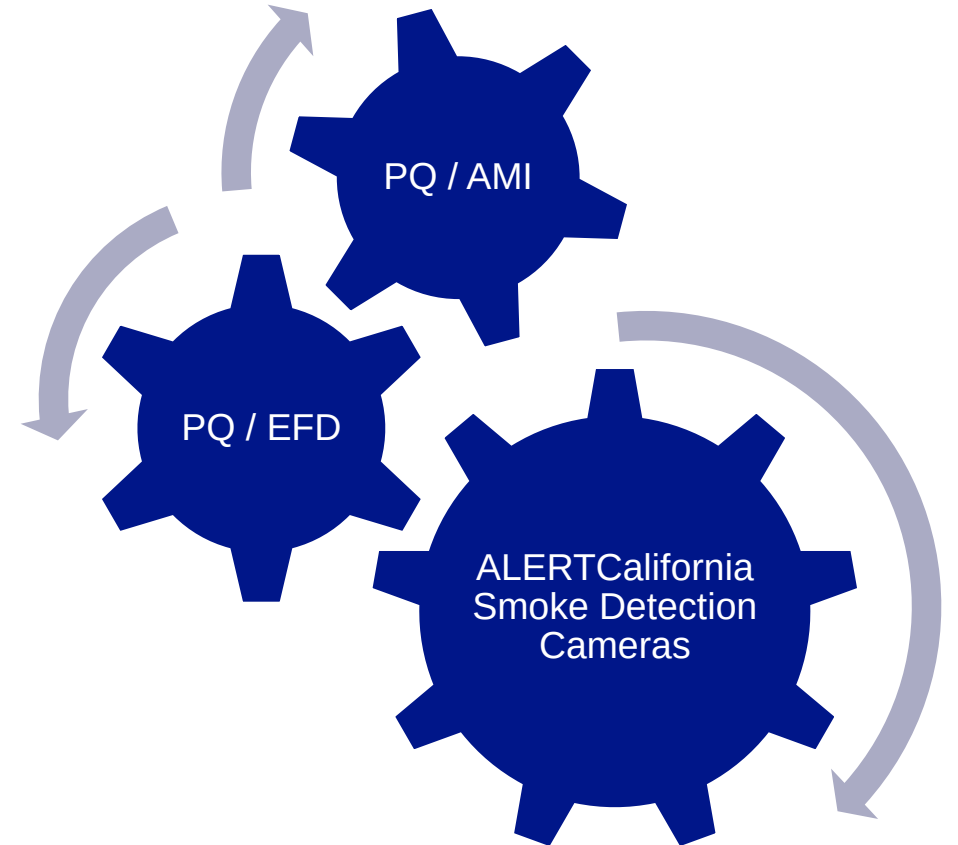
- Utility can **advance partial restoration** and **mitigate future risk**
- Minimizes vehicle travel and **reduces fire particulate**. Lowers the risk of substantial damage to vegetation and structures
- Benefits **entire IOU service territory**
- Preserves California's ability to **rely on solar renewables**

Supporting A More Nimble Grid And Increasing Public Safety

Integration of PQ, EFD, and fire detection cameras support a more nimble grid and increase public safety and reliability through advanced intelligence and accelerated findings

Assist With **Real-Time Findings** By Data Triangulation

Leverage **Advanced Metering Infrastructure (AMI)** as a next-generation technology to enhance other PQ resources

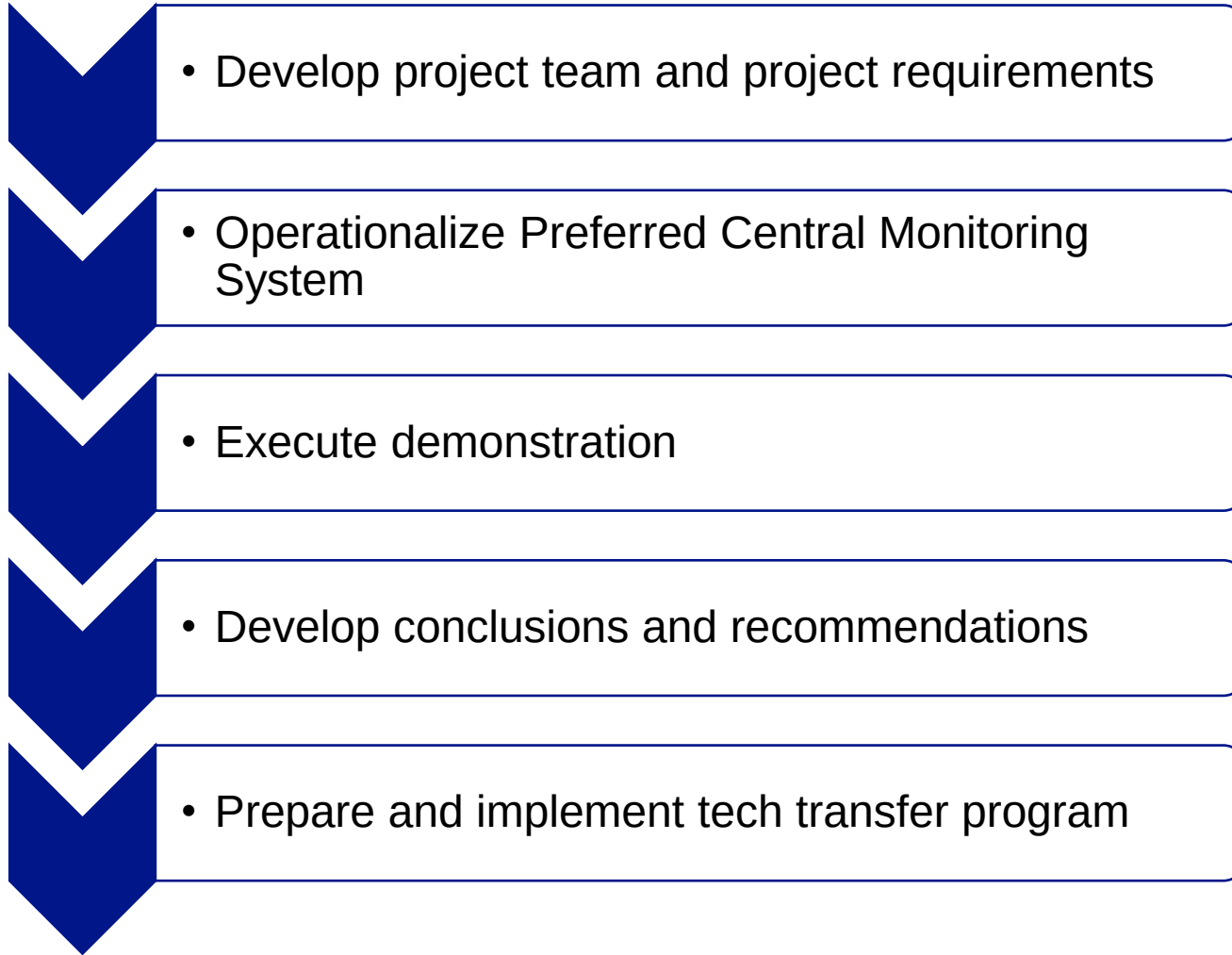


ALERTCalifornia's Smoke Detection Cameras

Red Mountain Riverside - South



Project Plan and Next Steps



- Adapt ALERTCalifornia camera technologies
- Adapt PQ data technologies
- Integrate EFD technologies
- AMI/Synchrophasor data exploration



Additional Questions?

Michael Colburn mcolburn@sdge.com

Kimberly Siebenthal ksiebenthal@sdge.com

**The next panel will start
promptly at 10:40.**



Driving Change: Technological Advances in Transportation Electrification and DER Integration



Dan Bowermaster (Moderator)

Senior Program / Area Manager, Electric Transportation
Electric Power Research Institute (EPRI)



Peter Chen

Supervisor, Transportation Unit
Energy Research and Development Division
California Energy Commission (CEC)



Matt Kedis

Senior Engineer, Engineering Development & Testing
Southern California Edison (SCE)



Mathias Bell

Vice President of Policy and Marketing
WeaveGrid



Kelsey Johnson

Senior Policy Advisor
Rivian

EPIC Project Support in Advancing Wildfire Rebuild Technology

Jordan Smith

Consulting Engineer, System Innovation



Energy for What's Ahead®



Wildfire Rebuild Technology Deployment

Project Overview

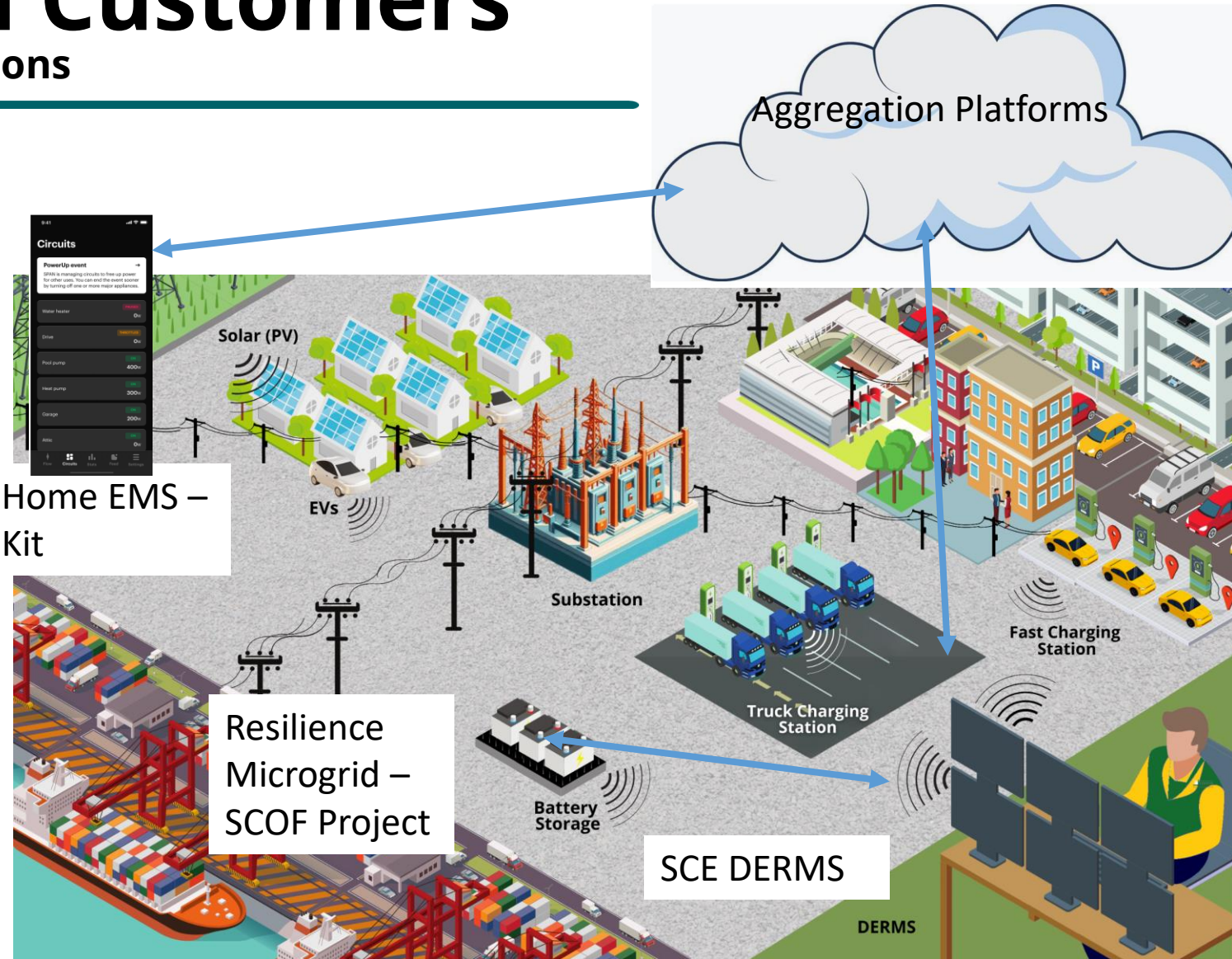
Context

In April SCE delivered a comprehensive plan to Governor Gavin Newsom to rebuild the electrical infrastructure and serve the communities around Altadena and Malibu impacted by the January wildfires. The focus is on reliability and resilience with large scale undergrounding and incorporation of advanced technologies. In focus are advanced grid sensors and controls for fast reaction to incidents, battery back up for critical care customers, resiliency zones to support communities in case of emergencies, and smart panels to provide resiliency and advanced load management functions to lower costs and increase capacity.

Areas of Focus	Objectives	Potential Outcomes
- Community Resilience Zones – to provide shelter to customers during grid emergencies and provide for essential continuity of critical community services - Smart electrical panels and associated Grid Edge gear and controls to provide customers with outage resiliency and the tools to manage flexible loads to save costs and support grid utilization	- Identify three to five groups of critical community facilities which can be designated within a zone to be designed to provide power resilient facilities – able to support the community for 24 hours and beyond - Install smart panels and other components to enable customer resiliency and advanced flexible load management systems to reduce bills and enable new technical options	- A set of Resiliency Zones which can be built within the communities to support critical services in the event of an emergency, supporting the local area with grid management at other times - A standard grid edge package of smart panel and associated equipment to enable resilience and smart load management - A demonstrated model for the future, where such systems could be deployed area wide

Deploying Advanced Technology to Support Rebuild Customers

EPIC Contributions



DERMS = DER Management System
EMS = Energy Management System
SCOF = Service Center of the Future
SIDER = Stability Improvement with DERs

EPIC 4.07

**“Battery Energy Storage System
(BESS) Voltage Support on
Radial Feeders”**





PG&E EPIC 4.07 Grid-Side Battery as Capacity and Interconnection Solution for Rural Customers

Enables 20+ new business applications and avoids \$50M+ in grid upgrades

Challenge

- Petrolia / Garberville areas face issues with power quality and capacity limited 49-mile-long line that prevents interconnection of new customers.
- Conventional grid upgrade = \$50M+



Garberville - Image:
VisitRedwoods.com

Technology Solution

- New battery energy storage system to support distribution primary voltage and capacity.
- Supports peak shaving and power quality
- EPIC 4.07 is developing the controls for this unique use case, to safely dispatch energy from the battery
- Potential model for other constrained, rural lines



PG&E Battery Energy Storage System

EPIC 4.24 Project Proposal “Electrification Journey”

Maggie Dong

Maggie.Dong@pge.com



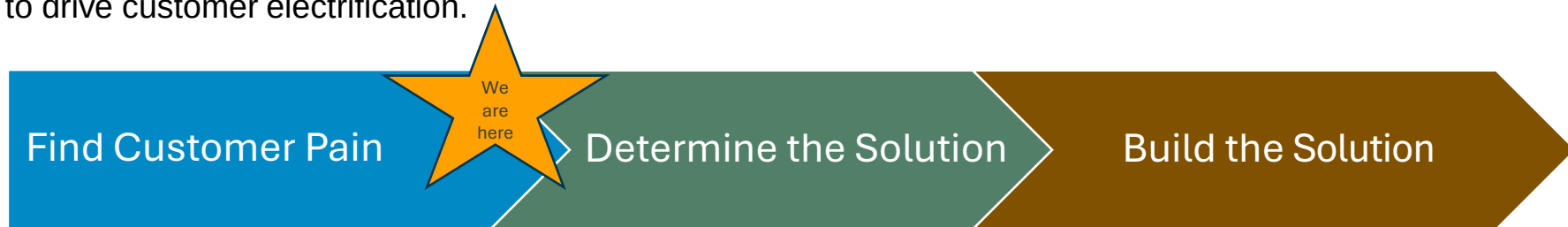


PG&E EPIC 4.24 Electrification Journey [New]

Drive residential electrification & EV adoption to improve affordability
(by increasing beneficial load and creating downward pressure on utility rates)

Demonstration Budget: \$3M

- EVs provide value to customers and are a key driver to PG&E's affordability strategy.
- EVs are becoming more affordable and accessible, however growth has stabilized at ~27% of new vehicle sales in 2024 and Q1 2025.
- To meet our long-term EV targets, PG&E is taking a new approach, leveraging a venture building and design thinking approach to identify new interventions to drive customer electrification.



Key pains identified through 40 customer interviews:

- Financial component is not clear or compelling for people to feel like they are making the "right" decision in going electric
- Fear of unfamiliar technology
- Perceived lack of suitable vehicle options (size, aesthetics, expected price point)
- Decision overload stemming largely from fear/uncertainty over long-term + large point-in-time EV costs
- Perceive infringement on freedom of mobility and current lifestyle due to lack of charging infrastructure

Needed Partner Expertise: Customer Interviews, Potential future vendor partnerships

**The next panel will start
promptly at 1:00.**



Zero Emissions Journey: Decarbonizing Buildings and Gas Synergy



Siva Sankaranarayanan (Moderator)

Principal Technical Leader
Electric Power Research Institute (EPRI)



Rachel Wittman

Principal
Building Electrification & Efficiency Strategy
Pacific Gas & Electric (PG&E)



Nick Kordesch

Energy Program Manager,
Sustainability and Resilience Division
City of Oakland



Felix Villanueva

Utilities Engineer
R&D Division
California Energy Commission



Therese Pepper, Ph.D

Program Director
California Institute for Energy and
Environment (CIEE)



SDGE™

Bridging Solutions With Distributed BTM Resources Concept

Roger Salas

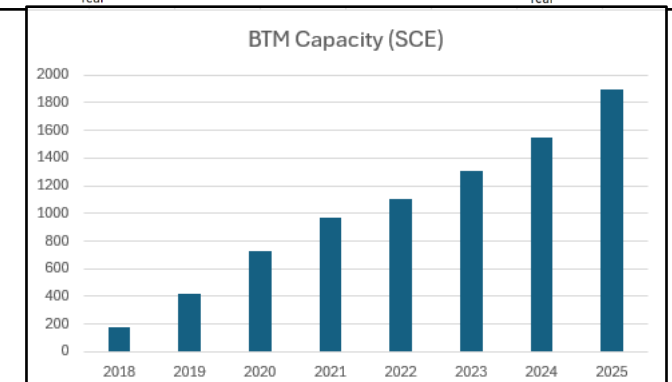
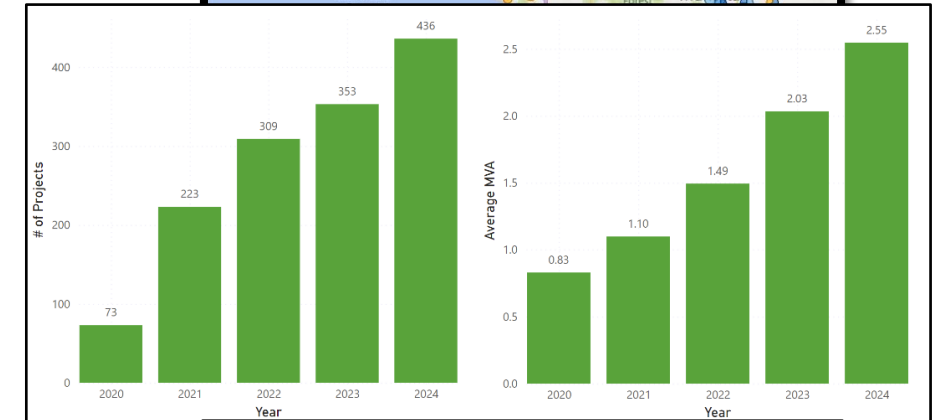
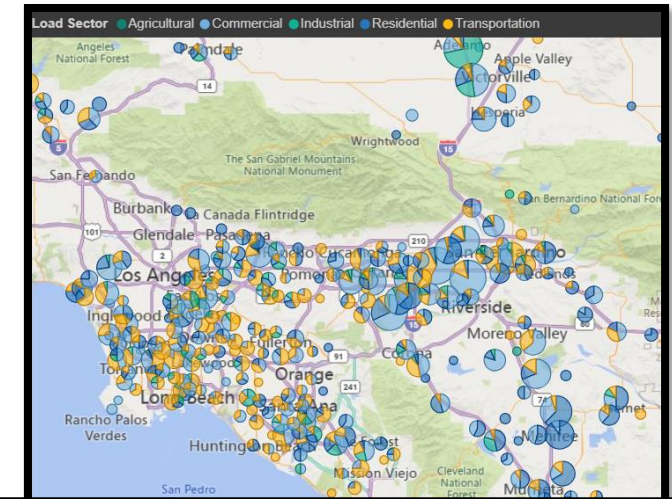
Principal Manager, Distribution System Analysis



Objective and Needs

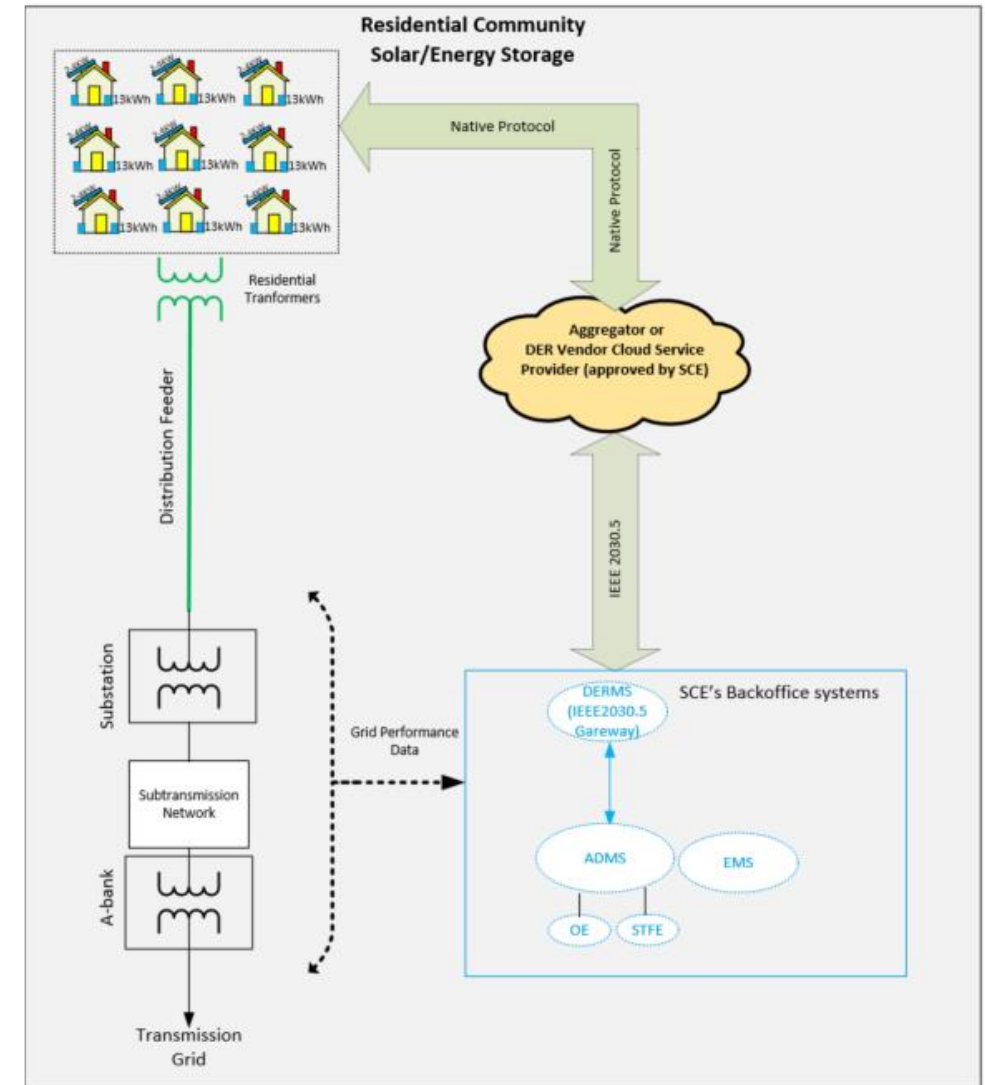
Growth of electrification, residential, and commercial load continues to strain the electrical system

- To quickly and safely serve the increased levels of capacity many aspects need to be coordinated:
 - Proper planning to account for all future load growth
 - Expeditious completion of grid upgrades
 - Optimization of all available resources
- Distributed Behind The Meter (BTM) DER resources with energy storage can provide additional grid capacity to support load growth
 - Orchestrated by SCE via its Distribution Energy Resource Management System (DERMS) to coordinate grid needs while optimizing available resource capacity
- Additional enhancements with use of BTM energy management systems can increase capability and provide additional value



Bridging Solution Using BTM DERs With Integrated LCMS Concept

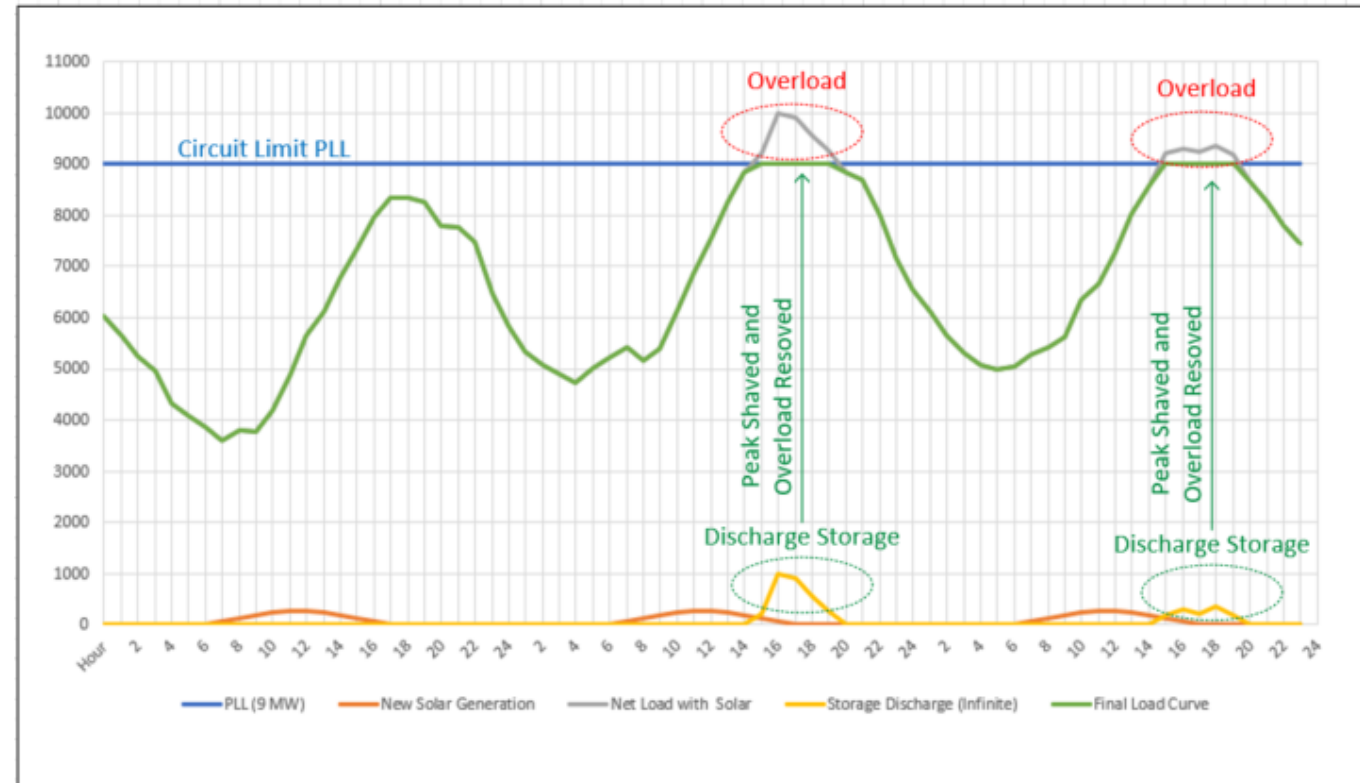
- DERMS **orchestrates the overall charging and discharging of aggregated energy storage** capacity to:
 - Reduce negative impacts due to charging
 - Increase grid capacity when discharging
- DERMS detects storage aggregate state of charge—available KWhrs—and requirement to **meet forecast peak demand**
- DERMS determines timing and magnitude of charging based on grid loading conditions and short term forecasts – Load Control Management System (LCMS) Functionality
 - Accounting for the **need to charge the storage in preparation** of grid needs
 - Accounting for the aggregate state of charge (available KWhrs)
- DERM sends commands to DER resources and receives confirmation of performance
- Increased capabilities can be provided with In-Front-Of-The-Meter (IFOM) community storage



Bridging Solution Using BTM DERs With Integrated LCMS

Concept- Example

- **Use Short Term Forecasting tools** to determine charging capabilities for the storage in preparation of peak need
- **Schedule discharging** of aggregated storage to meet grid capacity needs
- **Initiate other load reduction functionalities** to maintain grid within Planned Loading Limits (PLL)
 - EV charging
- **Integrate Vehicle-to-Grid (V2G)** technologies for additional support when available



Questions and Comments

EPIC 4.02 “Socket of the Future”

Patrick Varuzza

Patrick.Varuzza@pge.com





Respondents who don't have an EV: Understanding barriers

Explicit blocker

Could be an issue

Just curious

Yes. I'm very interested in purchasing an EV, but **haven't due to cost upgrading my panel.**

My wife is **willing to purchase an EV if we have the ability to charge at home. BUT she also doesn't want to pay more for a panel upgrade.** Stuck between a rock and a hard place.

Underground service and would be **costly to upgrade**

We have two gas vehicles each over 10 years old that we have been holding on to in anticipation of maturation in EV affordability and charging infrastructure. Although that maturation has happened, we do not have solar so the **only practical way to accommodate a reasonably fast charging EV would be through a service upgrade,** and the feed to the homes on our court is all underground which I suspect would make it even more costly to upgrade.

I'm in the market for a new car and the **panel upgrade is a consideration.**

My panel is maxed out. I would **likely need an upgrade for either a level 2 EV charger or to electrify my home** any further.

I will purchase an EV and install an AC in the future.

Would like to better understand the process from a customer's perspective. **I also anticipate that there will be complications at my home** with installing a L2 charger given the age of our home and its electrical system.

We don't have a strong electric draw (no AC, gas dryer, gas water heater) so I was hoping to get L2 without a panel upgrade. **Looking at EVs now, but hung up on charging options**

Interested to be able to charge EV vehicle at home, but require modification to existing 30A 220V breaker for electric dryer (not used) to be swapped out with 50A breaker with 40A dedicated EV charger.

Currently I do not have any plans to buy an EV. That could change if I decide to purchase a new vehicle, **but a panel upgrade would be a showstopper.**

Understanding WiFi capability of Riva and avoiding any upgrades needed to have EV

Upgrades may be blocking EV adoption



PG&E EPIC 4.02 Socket of the Future – Project Summary

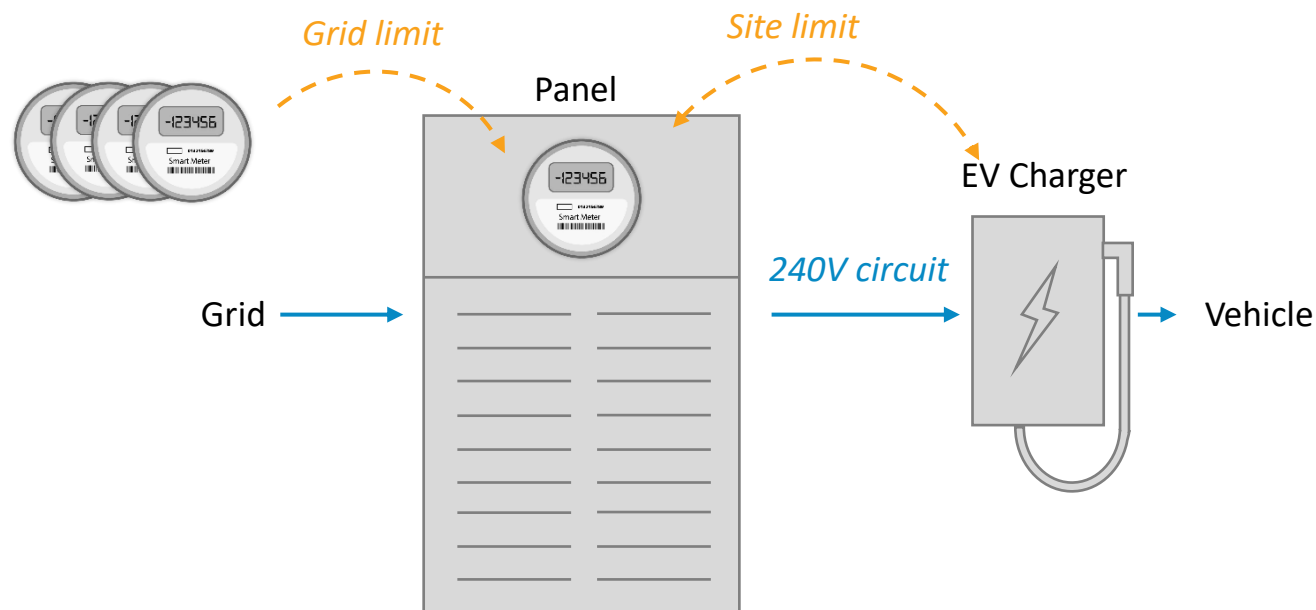
Problem Statement

Today's EV adoption process typically requires costly panel and service upgrades, and can trigger additional grid investments.

Panel + Service + Grid Upgrades = \$5k - \$50k

Solution

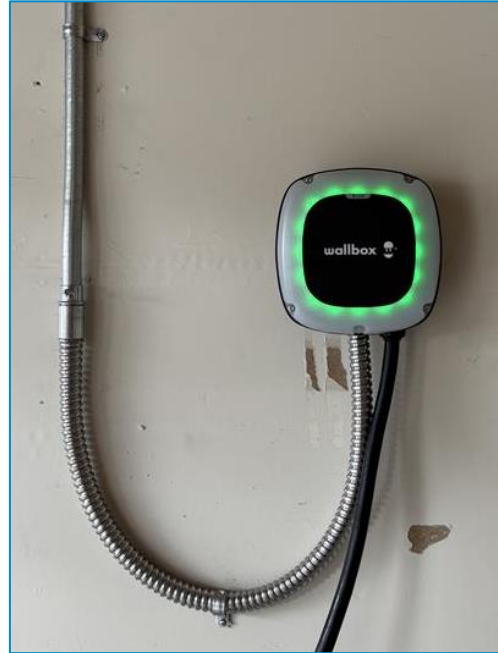
1. **Enable fast EV Charging at home**
2. **Avoid panel upgrades:** Manage EV charge rate, so the panel does not exceed its capacity
3. **Avoid upgrades on the grid:** Enable the new smart meters to talk to each other to avoid exceeding a transformers capacity



First Field Customer Deployment

Union City Field Test - Panel Limiting Capability with Participant #1

1. Meter is replaced with an AMI 2.0 meter
2. EV Connect app is loaded onto the meter remotely
3. Customer connects the EV charger to the meter via Wi-Fi
4. Meter calculates the grid/site limit in real time
5. EV charger reduces output when needed





Timeline and Next Steps

Q4 2024

Lab Testing

Customers: 0

Goal: Prove meter can adjust EV charge rate to protect customer's home panel

Q1 2025

Field Testing

Customers: 1 to 10

Goal: Prove meter & EV charger functionality with first customers in the field

Q3 2025 – Q4 2026

Expand Project

Customers: up to 1,000

Goal: Prove panel and service upgrades can be avoided at 1,000-unit scale

What's Next

1. Collaborate with other programs and teams focused on accelerating residential electrification
2. Design and launch solutions to address non-EV electric load growth challenges (HVAC, water heating, appliances, etc.)

EPIC 4.02B “Panel Upgrade Avoidance”

Matt Braunwarth

Matthew.Braunwarth@pge.com





PG&E EPIC 4.02B - Electrification “Add-On” Panel

Problem Statement

Expensive, time-consuming and complicated panel and service upgrades prevent customers from completing home electrification projects (adding EV charger, heat pump, AC, electric range, etc.)

Solution

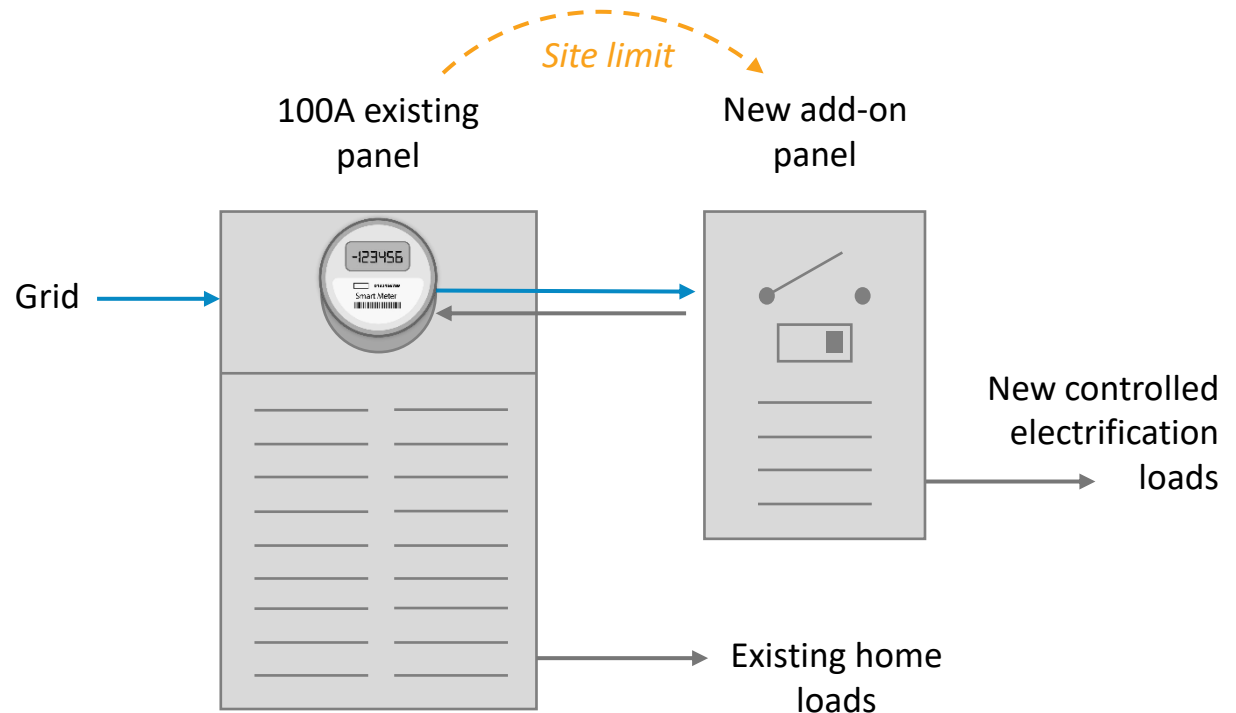
A compact, smart electric panel connected to the meter socket that lets you add new electrical loads without a panel upgrade. The “add-on panel” automatically manages the home's electricity to stay within limits of main panel.

Features

1. Add-on panel connected to meter collar
2. Sub-metering and control on every breaker
3. Connected to smart meter for service upgrade avoidance
4. Islanding relay for whole home backup
5. Target of <\$1,000/site in hardware cost

Benefits

Avoiding cost of panel and service upgrades for customers electrifying while creating downward rate pressure for all customers by deferring or avoiding service and transformer upgrades.





PG&E EPIC 4.02B Electrification & Panel Upgrade Avoidance

Early Discovery Effort:

- Completed 100+ interviews with homeowners and electricians to understand pain points and test product concepts.
- Homeowners typically are not presented with alternatives to full panel upgrades. They don't know what's options they have to avoid a panel upgrade.
- Electricians want clearer, more timely information from PG&E. They're eager for education on new technologies and code changes.

Next Steps with Partner Ecosystem:

- Leverage similar new smart meter infrastructure for EV managed charging solution in EPIC 4.02A.
- Explore existing smart panel options on the market and collaborate partners to offer a product to address the challenges customers face when electrifying their homes.

Estimated EPIC Project Cost: \$4 million

Workshop Wrap-Up

Future Participation & Feedback



Join the EPIC Proceeding

Join the EPIC Proceeding (Docket number R.19-10-005), by filing a motion for “party status” with the CPUC

Receive updates and invitations:

Workshops, regulatory decisions, and ongoing program updates.

Connect with us directly

PG&E

- Jimmy O’Hare (epic_info@pge.com)
- Sign up for the PG&E Innovation Newsletter, by emailing innovation@pge.com with subject line “Newsletter sign up”

SCE: Richard Kwee, epic@sce.com

SDG&E: Cynthia Carter, ccarter5@sdge.com

PG&E Pitch Fest

Sept 23 – 25

Applications open now through July 25

If you are developing a novel solution to one of the 13 problem statements outlined in the application, we encourage you to consider applying:

<https://pge.brightidea.com/2025pitchfest>

Please email innovation@pge.com with any questions.



Wildfire Preparedness & Prevention

Addressing wildfire risk demands bold solutions. PG&E is investing in asset monitoring, undergrounding, smart shutoffs, and vegetation management — and now we're calling on innovators like you to help us eliminate fire threats for good.

[Learn more](#)



Electrifying Our Hometowns

PG&E is building a net zero grid by 2040. We're seeking scalable, cost-effective solutions to integrate clean energy and support electrification without costly upgrades or delays.

[Learn more](#)



Load Management

With energy demand set to double by 2040, PG&E needs innovative ways to turn DERs into grid assets and expand load management. Bring your bold ideas to shape the grid of the future.

[Learn more](#)



Resource & Cost Management

PG&E is partnering with innovators to boost system reliability, lower costs, and improve service quality through breakthrough technologies and operational efficiency. Share your ideas to help us deliver smarter, more efficient service for all customers.

[Learn more](#)

We'd love to hear your feedback!

2-4 min survey on today's workshop and
ideas for future events



Feedback Survey: 2025 Annual Joint Utilities' EPIC Workshop



Thank you!