Joint Utilities' EPIC Disadvantaged Communities Webinar
Introduction and Overview

June 21, 2022

Agenda

Description	Speaker	Time
Safety Moment	Frank Goodman, Workshop Host (SDG&E)	10:00 am -10:05 am
Background & Workshop Purpose	Frank Goodman, Workshop Host (SDG&E)	10:05 am -10:10 am
Example DAC Demonstrations (Benefits)	Joint Utilities (PG&E, SDG&E, SCE)	10:10 am - 11:00 am
Workshop Question: Are there preferred resources and/or types of demonstrations that would be most beneficial to DACs and under-resourced communities?	Frank Goodman, Workshop Host (SDG&E)	11:00 am -11:15 am
Community Involvement Guidelines for DER Integration Field Demonstrations	Joint Utilities (PG&E, SCE, SDG&E)	11:15 am -11:50 am
Final audience questions	Workshop Participants	11:50 am -12:30 pm

Safety Moment

Beat the Heat: Stay hydrated, stay cool

- **Water.** Stay hydrated and drink fluids, even when not thirsty. It's recommended to drink one quart of cool water every hour. Remember, sweating removes salt and minerals from the body that need to be replaced.
- **Rest.** Preventative cool-down breaks should be taken in the shade to lower body temperature.
- **Shade.** Ensure shade is available by erecting shade or by using air-conditioned vehicle cabs.
- **Stay cool.** To help prevent heat illness, wear lightweight/loose clothing when outside or performing physical work, and wear sunscreen with SPF 15 or higher

Background and Workshop Purpose

Purpose: To seek input from Disadvantaged Communities (DACs) to aid in development of applications by investor-owned utilities (IOUs) for CPUC approval of IOU initiatives in the EPIC-4 cycle.

- The Utilities will share information on how communities benefit from EPIC projects with DACs, community-based organizations, and other interested stakeholders.
- The Utilities will solicit feedback from participants for priority focus areas for EPIC 4.
- Participants will have the opportunity to provide input on preferred energy resources and the types of demonstrations that would be most beneficial to their communities.

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
Investment in **applied energy science and technology** that provides public benefit but for which there is no current deployment of private capital.	Investments in technology demonstrations at real-world scales and in real-world conditions to showcase emerging innovations and increase technology commercialization.	Investments in market research, regulatory permitting and streamlining, and workforce development activities to address non-price barriers to clean technology adoption.
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

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

EPIC-4 Implementation Process

Sequence of Activity	Date
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	Schedule depends on duration of CPUC process
Project plans written and internal teams formed	Schedule depends on duration of CPUC process
External partners and contract resources arranged	Schedule depends on duration of CPUC process
Demonstrations performed and final reports are prepared	Schedule depends on duration of CPUC process

Examples of Past EPIC Projects with DAC Benefits

Presenter: Damian Inglin
Emerging Technology Strategy & Programs

June 21, 2022
Joint Utilities EPIC Disadvantaged Communities Workshop

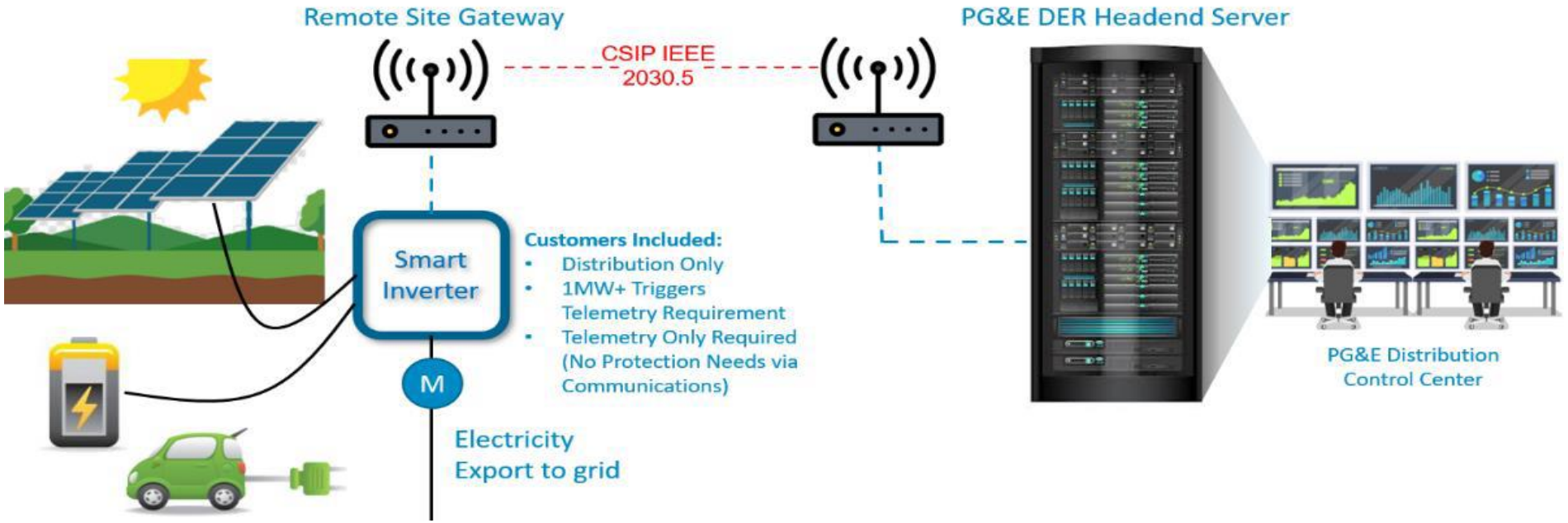
3.03 – Advanced DERMS & ADMS

Objectives

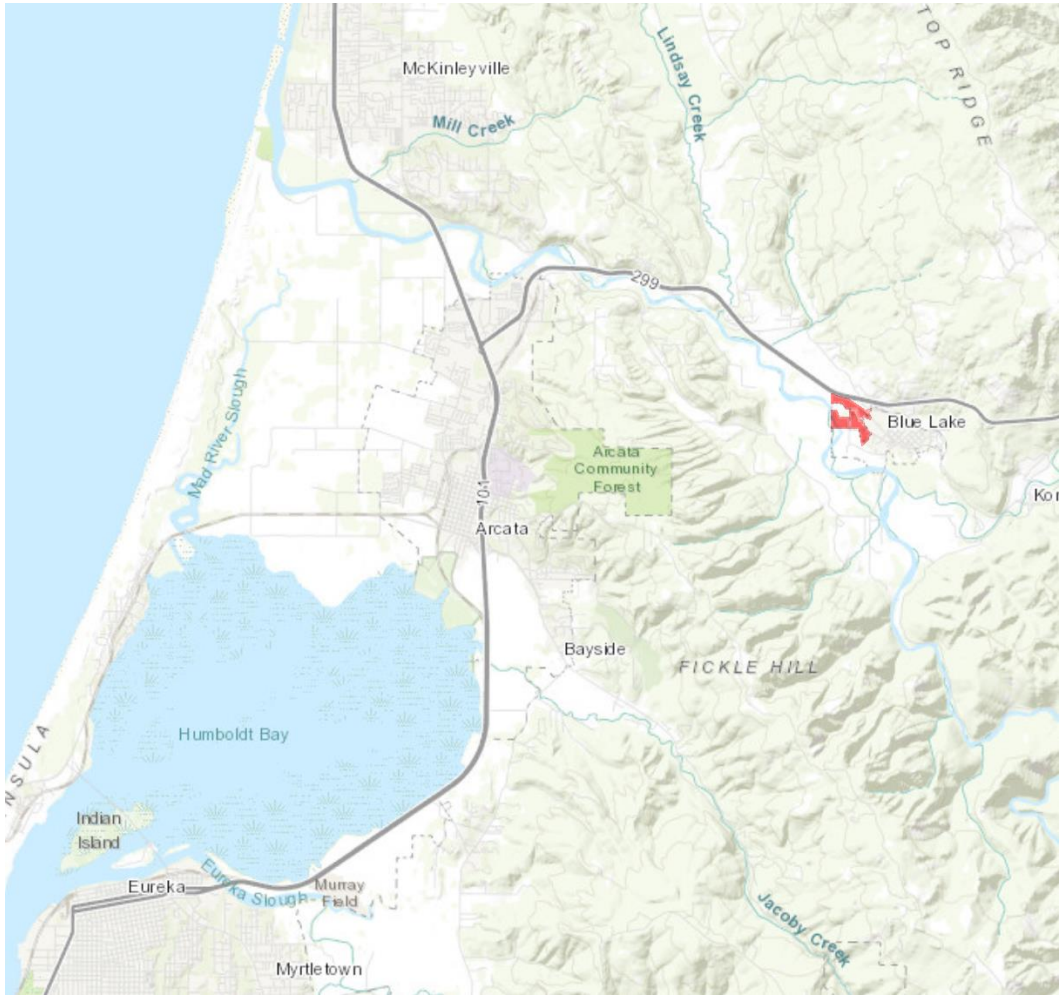
- Develop a DERMS head-end system and associated low-cost interface solution for DER telemetry & control
- Demonstrate this system for single customer DERs and pilot with multiple BTM DERs
- Provide a low-cost telemetry solution for new/existing DERs with the 1MW+ telemetry requirement

Status

- Telemetry interoperability and stabilization demonstration complete at two sites, and informing a DAC test site
- Working with aggregators to apply learnings to more complex systems which are likely



Blue Lake Rancheria



3.32 – System Harmonics for Power Quality Investigations

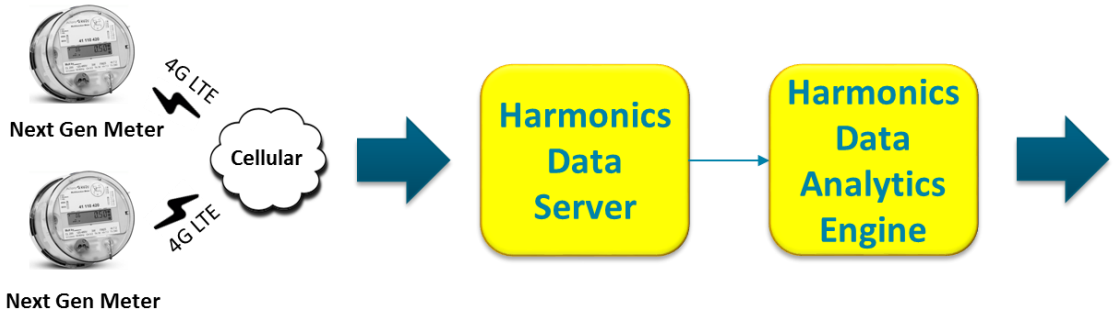
Harmonics issues on the grid negatively impact customer equipment operation and can also damage utility assets, including in DACs.

Objective

- Demonstrate the use of modern SmartMeters™ to detect, investigate and mitigate harmonic issues on the distribution system
- Higher incidence of harmonics issues is anticipated with increased DER penetration.

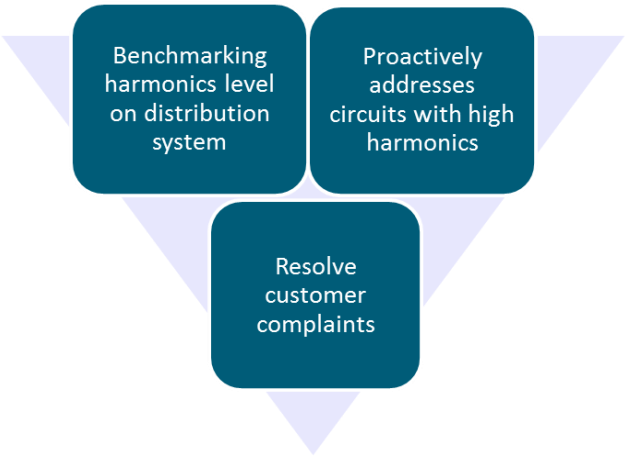
Status

- SmartMeters™ installed on representative circuits
- Data connectivity established, pipeline and dashboards created
- Data Analysis initiated, will continue through summer 2022



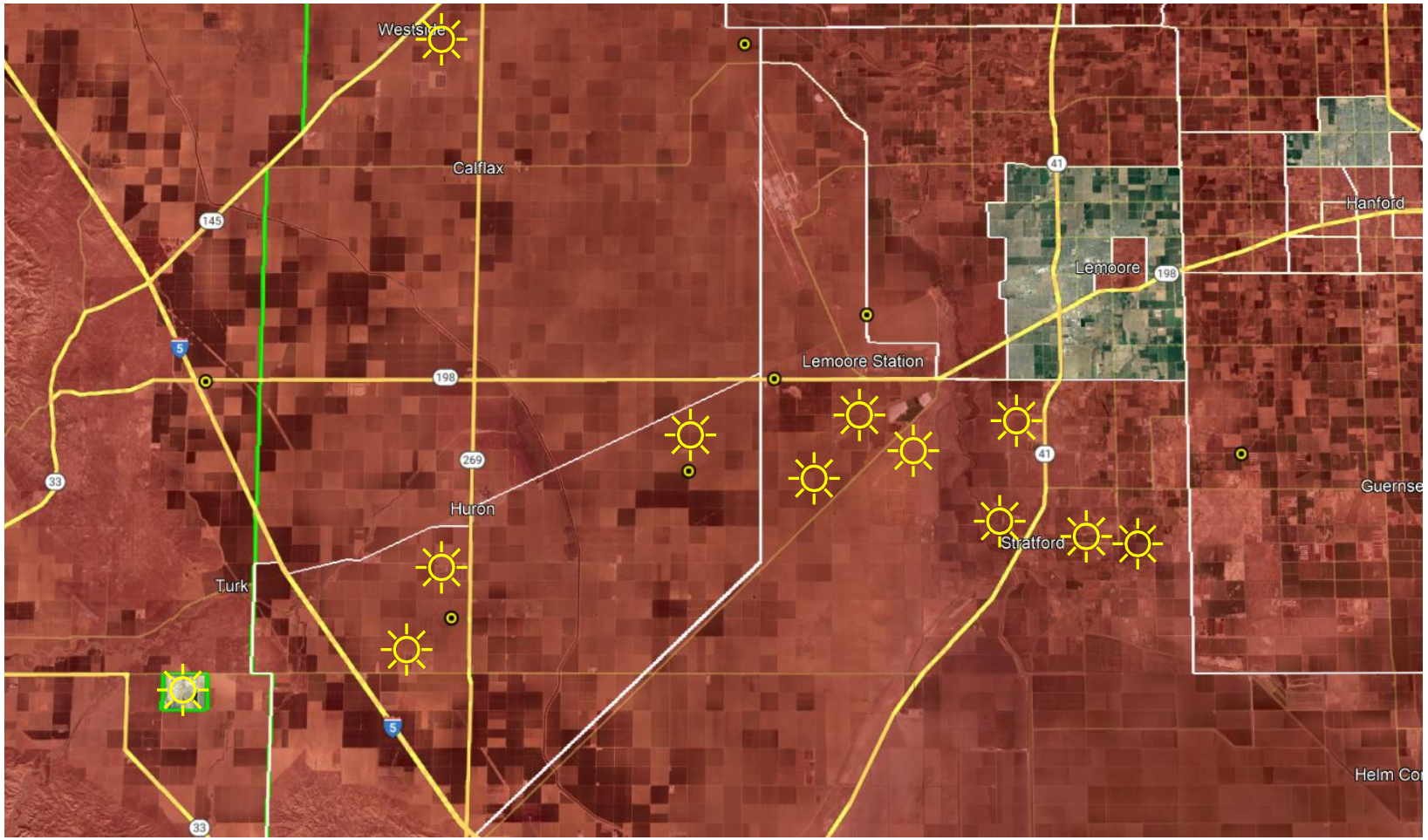
Next gen meters continuously monitor and transmit harmonics data

Harmonics data stored within PG&E server. Automated algorithms detect high harmonics level exceeding acceptable limits and flag meter locations for engineering review and analysis.



Harmonics data are used for investigating and resolving harmonics issues and tracking system harmonics

3.32 – System Harmonics for Power Quality Investigations



Solar Farm

DAC

Examples of Past EPIC Projects with DAC Impacts

Presenters
Frank Goodman, Advanced Clean Technology
Michael Colburn, Electric System Hardening

June 21, 2022

For Presentation at Joint Utilities' EPIC
Disadvantaged Communities Webinar

EPIC-3, Project 7 – Demonstration of Multi-Purpose Mobile Battery Energy Storage System (MBESS)

Objectives

- Pre-commercial demonstration for proof of concept
- Determine value proposition for alternative use cases
- Identify preferred sequencing for rotational use at various sites
- Encourage the emergence of an MBESS supplier industry
- Not an evaluation of specific vendor products

MBESS at port tenant site

Status

- Several use cases demonstrated with two MBESS units at various sites in two work modules
- Final reports for both modules posted on www.sdge.com/epic
- Third module with additional use cases in progress
  - Will include trial of IEEE 2030.5 interoperability standard

MBESS at community resource center

EPIC-3, Project 7 – Demonstration of Multi-Purpose Mobile Battery Energy Storage System (MBESS)

Benefit Areas:

Peak Demand Reduction	Community & Climate Change
• Customer bill savings • Mitigate procurement and generation costs	• Greenhouse gas (GHG) emissions reduction • Disadvantaged and low-income communities
Grid Modernization & Resiliency	**Economic**
• Contribute to microgrids as a tool for modernization and resiliency • Wildfires	• Improve efficiency • Reduce electrical losses in transmission and distribution

Module 1

Evaluation of stacked benefits at multiple sites
362kW/1499kWh Battery

Module 2

Back up power solution for planned safety outages and emergency events
100kW/525kWh Battery

EPIC-3, Project 7 – Demonstration of Multi-Purpose Mobile Battery Energy Storage System (MBESS)

Example Use Cases

- Support for critical loads during emergencies
- Emissions reduction relative to alternatives
- Support community resources centers during emergencies
- Applications in DACs and under-served communities

Forward Looking

- Evolve into a mobile microgrid
- Candidate for inclusion in SDG&E EPIC-4 application

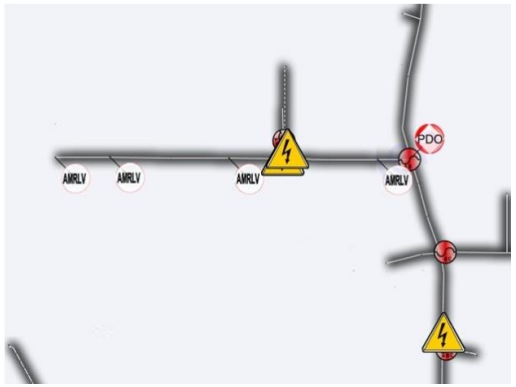
MBESS at Cameron Corners Microgrid

EPIC-3, Project 4 – Safety Training Simulators

Objectives

Configure existing off-the-shelf software to improve the instructional training experience for two workgroups

- Module 1: Distribution System Operators in Training: Integrate data from various virtual systems to provide one view for operator trainees (SCADA, wireless fault indicators, smart meters, synchrophasors).
- Module 2: Journeymen Lineworkers: Use augmented/virtual reality to improve the training experience applied to implementation of equi-potential zones for underground distribution



Module 1: Eliminating Fault Location Ambiguities

Module 2: Equi-Potential Zone Training in Virtual Reality

Status

- Work in both modules has concluded
- Final reports for both modules posted on www.sdge.com/epic

EPIC-3, Project 4 – Safety Training Simulators

Benefits

- Supports CPUC policy, holding IOUs to a higher standard for safe operation of their systems
- Supports utility needs to modernize training experience for improved, more efficient student learning outcomes
- Improves public and worker safety
- Improves response times and reduces outage times, leading to higher reliability

Forward Looking

- Improved fault response times will improve customer experience and can reduce wildfire risks
- Example of how EPIC projects can benefit all customer classes, including DACs and underserved communities

How Service & Distribution Center of the Future Benefits Disadvantaged Communities

How Can Communities Get Involved with Future DER Integration Field Demonstrations

Presenter

Josh Mauzey
Senior Manager,
Grid Edge Innovation

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SOUTHERN CALIFORNIA EDISON®

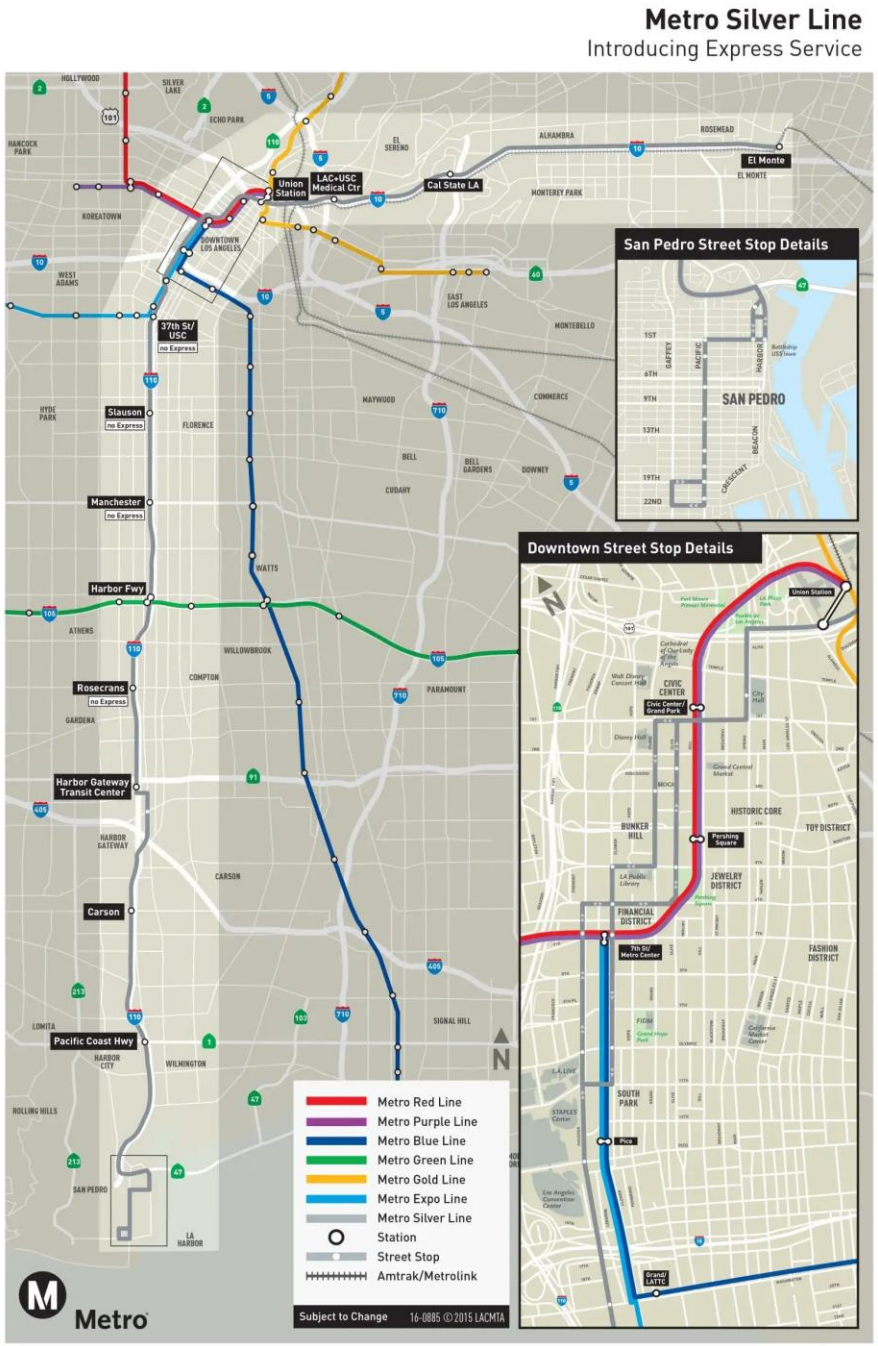
Service Center of the Future is a partnership between SCE and LA Metro benefitting those who ride buses on the 38-mile J (Silver) Line

- SCE is working with LA Metro to support Metro's first fleet depot electrification, Division 9 in El Monte, which supports over 200 buses as a central fleet hub. Full electrification requires significant advances in electrical service, creating the opportunity to demonstrate advanced technology solutions.
- This EPIC project supplements SCE's Charge Ready Transport program by demonstrating advanced control and resiliency elements common with microgrids and integrates them with depot electrification and management techniques to save customers and benefit the grid and community. Charge Ready Transport program offers low- to no-cost electrical system upgrades to support the installation of EV charging. The $358-million program provides funding to help electrify big rigs, buses, delivery trucks and other large vehicles.

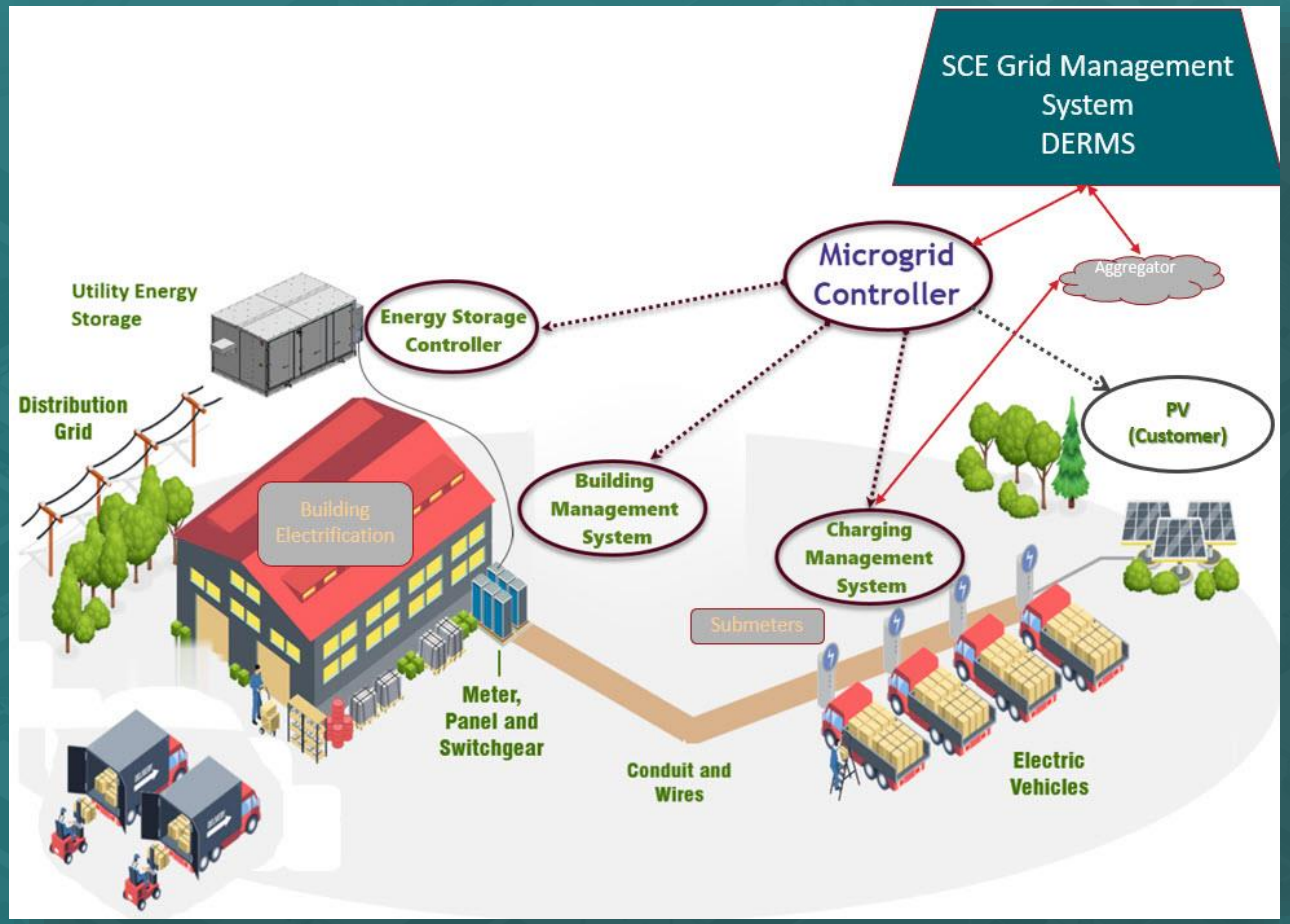
Service Center of the Future brings clean energy to the multiple communities the J Line buses travel through between El Monte and San Pedro Harbor

- This project protects disadvantaged and vulnerable communities by helping to reduce diesel heavy vehicle emissions on bus routes and improving air quality for the different cities, their residents and those who ride the buses

Key Goal: Learnings will enable further deployment of such technology and lower the cost and time required for large-scale fleet electrification on both the utility and customer side, while showing that such facilities can serve to dynamically support the grid. The microgrid control system can interact with Metro DERs to respond to local grid events while maintaining reliable service.



Project elements range from large scale systems to smaller scale sensors



Project elements include:

- Site energy controller: Microgrid Control System (MCS)
- SCE energy storage system (battery)
- Building electrification – convert from gas to electric HVAC, hot water. Optimize and control with building energy management system
- Electric bus charge management system (LA Metro)
- Electric bus chargers (low and high power)
- EV charging submeters

Project Objectives and Use Cases

Load Management or Demand Response

- Microgrid control system (MCS) to communicate and manage load reduction events with on-site DERs
- Building management system (BMS) to balance building operations with savings opportunity
- Charging management system (CMS) to balance bus operational demands with charge time flexibility

Grid Support

MCS to support over/under voltage grid corrections using BESS and controls, charge/discharge BESS to support grid capacity needs

Resiliency

MCS to manage island formations and power-off bus charging, grid re-synchronization

Building Electrification

Convert building to full electric, eliminating gas and leveraging energy management

EV Charging Submetering

Incorporate individual charger utility metering and DC metering with back-office analysis

Service Center Challenges and Value to Communities

Enhance Value to Customers

- Demonstrate alternative service options and real/controlled capacity needs
- Integration of fleet operational control strategy with site and grid energy management systems
- Secure communication between microgrid and third-party DERs
- Interconnection of ESIP storage system and battery management functions (grid side, customer side, generation, distribution)
- Siting of storage and infrastructure components on customer property and consideration of operational needs, configuration, switching
- Demonstrate advanced metering options and back-office systems
- Demonstrate building electrification, heat pump water heating, and integrated systems controls

Protect Disadvantaged and Vulnerable Communities

- Outage resiliency of bus charging with energy storage
- Help reduce diesel heavy vehicle emissions on bus routes

Reduce Greenhouse Gas Emissions

- Learnings to enable further deployment of such technology and lower the cost and time required for large-scale fleet electrification

What can communities do to get involved in demonstrations?

- Communities can understand social and technical considerations SCE uses to source demonstration locations and can partner with SCE to identify those considerations
- SCE's Local Public Affairs group can work with communities to identify whether their community is eligible for future opportunities

Customer/Social Considerations

Community Impact to:

- Value of service
- Disadvantaged communities
- Critical infrastructure
- Expected customer minutes of interruption (CMI)

High fire risk area (HFRA) and high wind events, subject to PSPS

Capital cost and funding partnership

Shareholders engagement and commitment

Technical Considerations

Does this technology alleviate known, or forecasted, grid issues for the area?

- Reliability
- Resource adequacy
- Resiliency

Deployment site considerations:

- Electrical capacity & structures
- Space, physical access and security
- Telecom infrastructure
- Existing customer assets (Solar, Storage, charging infrastructure)

Discussion Session

Thank you for participating. To submit ideas or comments following the workshop, please use the contacts below.

Utility	Contact	Website
PG&E	Damian Inglin damian.inglin@pge.com	www.pge.com/epic
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