

CA IOU Demand Response Emerging Technologies

Mark Martinez – Southern California Edison Albert Chiu – Pacific Gas and Electric Jeff Barnes – San Diego Gas and Electric









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- California's **Demand Response Emerging Technologies** (DRET) programs fund research on innovative technologies, software, and products that can enhance DR participation and grid reliability.
- The DRET programs are administrated by Southern California Edison (SCE), Pacific Gas & Electric (PG&E), and San Diego Gas & Electric (SDG&E) and are authorized by the California Public Utilities Commission (CPUC) for the 2018-2022 DR program cycle.



DRET is strategic for the future of DR

- The DRET programs are designed to accelerate developments in markets and technologies faster than traditional DR customer programs can adopt as innovation is often unscheduled and unexpected.
- The DRET research provides critical information, for utilities, policy makers, and industry partners to advance the envisioned energy future with rapid deployment of proven, cost-effective technologies.
- **DRET is an approved CPUC strategy** that can assist DR programs so that proven enabling technologies can be scaled and thereby expand the customer participation required to enable new forms of DR in the future.





PLMA Key Drivers for DRET Research Activities









- Intake and Curate: how DRET searches, identifies, and selects opportunities for investments in innovative research. DRET casts a wide net into the DR ecosystem to harvest the most innovative emerging technology creativity.
- *Market and Technology Assessments:* how DRET conducts innovative market and research papers and studies and demonstration projects in the laboratory and field and in collaboration with State and national research
- **Technology Transfer:** how DRET advances emerging technologies to the next step in market adoption. Without outreach and engagement, research outcomes cannot be effective or impactful for the new DR markets in California.
- Strategic Advocacy: how DRET facilitates DR market development through trade vendor advocacy, construction standards, technical working groups, innovators, manufacturers, and DR software consultants and subject matter experts.







- Residential Electric Storage SCE
- Flexible Residential Pool Pumps SCE
- DR Strategies for Heat Pump Water Heaters SCE
- Residential EV Charging Station for ADR PG&E
- Digital Rate Study PG&E
- Smart Speaker for TOU Customers PG&E
- DER Data Analytics for DR SDG&E
- EV Charging Impact Study SDG&E

SCE-Residential Electric Storage

- SCE is researching multiple aspects of residential storage to enable possible future utility and customer grid services.
- SCE is analyzing the market and technology landscape and developing test plans to assess communication functionality.
- SCE deployed electric storage technologies in the field to test secure DR communication, charging cycles, and ability to adopt TOU pricing schedules.



SCE-Flexible Residential Pool Pumps

- SCE's service territory includes 486,000 pumps for in-ground pools. Most of them operate 6-10 hours per day & can take place during any time period.
- Upcoming pool technology standards are creating future opportunities to deploy these devices for DR flexibility.
- Many pump manufacturers are now offering connective capabilities for their variable speed pool pumps with "smart" controls and APIs.







PLMA SCE-DR Strategies for HPWHs

- SCE is researching DR flex opportunities from the beneficial electrification strategies in progress.
- This aligns with SCE's ET Technology Roadmap priority for customers with Cleaner Energy Choices.
- Initial lab and field studies have focused on residential heat pump water heating.





PG&E-Residential EV Charging Station for ADR



PLMA Dead Management Leadership PG&E-Digital Rate Study

Objective

To evaluate 3rd party (example: IDSM aggregators and smart energy vendors) interest in receiving hourly residential digital rate.

Enable 3rd party to use the information to develop service for residential customers who enroll in a dynamic rate such as TOU, EV and Smart Rate.



PG&E-Smart Speaker for TOU customers

• The objective of this DRET demonstration project (study) is to leverage residential Voice Assistants technology (such as Amazon Alexa, Google Home) to educate residential customers on energy usage and bill forecast, rates and Time-Of-Use automation/optimization, available IoT and connectivity, configuration, and notification on utility information.







LMA SDG&E - DER Data Analytics for DR

- Developing web-based data analytics tool incorporating battery storage and solar to maximize DR program participation
- Analyzes customer benefits of battery storage and solar
- Identifies non-residential customers who stand to benefit the most by enrolling in DR programs
- Final analysis and report are nearing completion





PLMA SDG&E – EV Charging Impact Study

- Testing real-world impact of introducing EV charging to commercial office building equipped with solar and battery storage
- Goal is to identify and quantify solar over-generation mitigation as a benefit of interconnected workplace EV charging
- Results should provide insight into potential of mass EV adoptions







Learn more at www.dret-ca.com

DEMAND RESPONSE EMERGING TECHNOLOGIES

DRET



The Demand Response Emerging Technologies (DRET) collaborative consists of three electric utility research programs in California that are investing more than \$25 million over five years for the specific purpose of accelerating the market adoption of innovative demand response enabling technologies in all customer sectors to meet California's electric reliability and climate goals.

The programs in the DRET collaborative are funded by and also benefit electricity ratepayers from the state's three largest investorowned utilities – Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E) and is authorized by the California Public Utilities Commission (CPUC) through 2022.







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