

**DEMAND RESPONSE
EMERGING
TECHNOLOGIES
PROGRAM**

**SEMI-ANNUAL REPORT
2024**

September 30, 2024



Table of Contents

Table of Contents	2
Summary	3
I. Completed Activity during the Reporting Period	3
A. Managed Electric Vehicle (EV) Charging Demonstration	3
1. Overview	3
2. Collaboration	3
3. Status	3
II. Ongoing Projects thru the Reporting Period	4
A. Evaluating Demand Response Capabilities of Connected Variable Capacity Heat Pumps	4
1. Overview	4
2. Collaboration	4
3. Status	4
4. Next Steps	5
B. Flexible Demand Response Collaborative	5
1. Overview	5
2. Collaboration	5
3. Status	5
4. Next Steps	6
III. New Projects Initiated during the Reporting Period	6
A. Smart Panel Demand Response and Load Management Study	6
1. Overview	6
2. Collaboration	7
3. Status	7
4. Next Steps	7
IV. Budget	7

Summary

The Demand Response Emerging Technologies (DR-ET) Program Semi-Annual Report for the period of Q2 and Q3 2024 is being submitted pursuant to Ordering Paragraph 59 and the discussion at pages 145-146 of Decision (D.) 12-04-045. During Q2 and Q3 2024, San Diego Gas & Electric DR-ET Program completed one (1) activity, initiated one (1) new project and continued to manage two (2) ongoing projects.

I. Completed Activity during the Reporting Period

A. *Managed Electric Vehicle (EV) Charging Demonstration*

1. Overview

The Managed Electric Vehicle (EV) Charging Demonstration monitored charging behavior of a group of customers who registered through a web portal and connected their vehicle(s) to the managed charging platform.

The demonstration included active and behavioral managed charging functionality and provided telematics data to quantify the impact of potential managed charging offerings.

Participating customers were surveyed about the impact managed charging events had on their day-to-day EV use and charging behavior.

2. Collaboration

Although this demonstration was primarily for SDG&E teams to gain familiarity with Managed EV Charging functionality and data collection, the progress and results were shared with other California Investor-Owned Utilities (CA IOUs) DR-ET Leads. SDG&E's ET Team also collaborated with its Clean Transportation and Demand Response Program teams on this study.

3. Status

A group of customers was recruited to participate and enroll EVs in the demonstration. The EVs were signaled during simulated and actual Demand Response events in Q3 2024. The vendor provided SDG&E with an analysis of EV charging behavior before, during and following each event as well as the telemetry data for each participating vehicle. The demonstration was completed in Q3 2024.

II. Ongoing Projects thru the Reporting Period

A. *Evaluating Demand Response Capabilities of Connected Variable Capacity Heat Pumps*

1. Overview

This study is testing whether variable speeds of heat pump compressors and fans can improve comfort and overall performance as well as provide an improved resource for demand response.

The primary research objective is to conduct shed events with and without pre-cooling or pre-heating strategies combined with varying levels of HVAC capacity limiting; and to demonstrate functional capabilities of variable capacity systems for demand response.

Potential research questions include:

- Can variable capacity systems respond more effectively to demand response signals compared to other types of heating, ventilation and air conditioning (HVAC) equipment?
- How is customer comfort impacted during demand response events?
- Can the duration of a demand response event be extended prior to customer opt-out?
- Can demand response programs tailored to variable capacity systems result in higher levels of program adoption by customers given system features that may help overcome typical demand response program enrollment barriers?

2. Collaboration

The progress and results will be shared with other CA IOUs DR-ET Leads.

3. Status

The vendor has been working on recruitment activities with manufacturers and identified compatible systems that can participate in the evaluation. The vendor is developing a recruitment portal for customers to sign up to participate. The vendor has developed a preliminary use case framework.

4. Next Steps

The project is expected to continue thru 2025. Upon completion, the final report will be published to the Energy Transition Coordinating Council (ETCC) web site for public review and reference.

B. Flexible Demand Response Collaborative

1. Overview

This project is designed to advance Flexible Demand Response by modeling and demonstrating its value when employed as a balancing resource to support integration of wind, solar and other variable supply.

Project structure includes a collaborative effort to demonstrate effective and sustainable demand flexibility from large pumps and other loads such as EV fleet charging. core focus is on water or wastewater facilities to engage large pumping loads as flexibility resources and to identify viable load shift strategies.

The results will inform demand response models for operations and planning tools so Flexible Demand Response can be scheduled and dispatched.

Potential research objectives include:

- Demonstrating the capability and value of large pumping and EV fleet charging loads to flex usage.
- Characterizing and modeling the capability and availability of large pumps and other loads for better integration in power system operations.
- Fostering industry collaboration to explore program alternatives and share best practices in sustainably engaging Flexible Demand Response to support system flexibility needs.

2. Collaboration

The progress and results will be shared with other CA IOUs DR-ET Leads.

3. Status

The Flexible Demand Response model and simulation continue to be developed for EV fleets. The project agreement was amended in Q3 2024 to extend the term thru 2026.

4. Next Steps

The project is expected to continue thru 2026.

III. New Projects Initiated during the Reporting Period

A. *Smart Panel Demand Response and Load Management Study*

1. Overview

The Smart Panel Demand Response and Load Management Study will examine the load shed and shift potential of smart panel devices. The study is leveraging a field demonstration that has been initiated through CalNEXT, the statewide electric energy efficiency emerging technologies program.

Smart panels will be installed at residential customer sites that replace or augment typical residential electrical panels. Smart panel features allow homeowners to monitor and understand their energy usage similar to dedicated energy monitoring services; and throttle or manage circuit-level power through software or programming. The circuit-level control of the smart panel allows the system to shut off dynamic combinations of non-critical loads during demand response events. The smart panels may also be able to help control the flow of renewable and stored energy for resiliency or load flex purposes.

The study will identify host sites to demonstrate smart panel capabilities, gather occupant and installer feedback, quantify costs and assess benefits. Tested configurations will depend on the selected sites, but each will include accompanying measures enabled by the smart panel, such as a heat pump water heater, heat pump HVAC system, and/or EV charger. Site recruitment will focus on sites that include photovoltaics (PV), energy storage, and/or smart loads to evaluate the ability to control the Distributed Energy Resources (DERs) using the smart panel, if possible.

A final report will outline the qualitative and quantitative findings in support of market adoption, future research directions, and/or program design.

Potential research questions include:

- Can smart panels allow dynamic control of critical loads by controlling circuit ampacity?

Demand Response Emerging Technologies Program (DR-ET)
Semi-Annual Report: 2024

- Do smart panels allow unwanted circuits to be turned off during an event or outage?
- Can smart panels allow for dynamic control of certain non-critical loads during a demand response event?
- Can smart panels manage PV and/or energy storage systems?

2. Collaboration

The progress and results will be shared with other CA IOUs DR-ET Leads. SDG&E’s ET Team is collaborating with its Demand Response Team on this study.

3. Status

The contract with the vendor was executed in Q3 2024.

4. Next Steps

Customer recruitment is under way and expected to continue thru Q4 2024. Smart panel installations are expected to be completed in Q1 2025.

IV. Budget

Program Approved Budget 2024-2027¹

	2024	2025	2026	2027
ET-DR	\$774,000	\$774,000	\$774,000	\$774,000

¹ Approved Budget per D.23-12-005 (dated December 14, 2023)