

**Emerging Markets & Technology  
Demand Response Projects  
2023 Q4 – 2024 Q1 Semi-Annual Report**

**March 29, 2024**

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## **I. Summary**

Pacific Gas and Electric Company (PG&E) submits this semiannual report as directed in *Decision Adopting Demand Response Activities and Budgets for 2012 through 2014*, Decision (D.) 12-04-045, Ordering Paragraph (OP) 59 and continued per D.14-05-025 and D.16-06-029 adopting Bridge Funding for 2015-16 and 2017, respectively. The Demand Response Emerging Technologies (DRET) Program was also approved in the *Decision Adopting Demand Response Activities and Budgets for 2018 through 2022*, D.17-12-003.

PG&E's DRET program continues to explore new technologies and applications that have the potential to enable or enhance demand response (DR) capabilities and can include hardware, software, design tools, strategies, and services. Examples of some of the types of enabling technologies that have been investigated are advanced energy management control systems (EMCS), direct load controls, and advanced heating, ventilation, and air conditioning (HVAC) controls.

PG&E's DR Portfolio Strategy centers on addressing both customer and grid needs today and, in the future, taking into account Rule 24, and the enablement of DR integration into the ISO wholesale markets. In addition, PG&E acknowledges the rapid development of "smart" devices, storage, and other technologies that are seeing increasing customer adoption across sectors and have the potential to help customers better perform in DR programs and or dynamic rates.

PG&E, Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E), collectively referred to as the Investor Owned Utilities (IOUs), share updates on individual projects, including project status and findings, at monthly DRET conference calls as well as via participation in the Emerging Technologies Coordinating Council (ETCC) quarterly meetings.

## **II. Projects Completed in Q4 2023 and Q1 2024**

### **A. Evaluate Third Party Aggregator and Vendor Interest in Residential Digital Rates**

#### **1. Overview**

The objective of this study is to evaluate third-party (example: integrated demand side management aggregators and smart energy vendors/manufacturers) interest in using residential digital rates to help customers be successful when enrolling in a dynamic rate such as time of use (TOU), electric vehicle (EV) and SmartRate. Below are the proposed scoping topics for this study:

- Defining a digital rate;
- Determining the format of the dynamic rate;
- Scoping information technology (IT) architecture design that can be scaled in the future;
- Documenting third parties' preferences on the channels and different type of rates;
- Testing different channels that can provide digital rates to third parties; and
- Testing the elasticity of different type of rates (dynamic, tier and non-tier, etc.);

## 2. Collaboration

PG&E's DR Emerging Technology and Data & Energy Platforms (e.g., Share My Data) jointly designed and implemented this Emerging Technology assessment. Internal stakeholders include, but not limited to, the Pricing Products, Customer Programs and IT teams. PG&E hired a consultant to lead the digital rate development.

## 3. Results/Status

Despite extensive outreach, the Study had a low uptake from Providers. Four of the five enrolled Providers withdrew from the Study prior to receiving price data. Low participation in the Study can be attributed to several factors including a requirement to obtain PG&E Share My Data (SMD) authorizations, no participant incentive or long-term guarantee of price delivery beyond the Study, and multiple price delivery regulatory efforts and systems pulling interested parties in different directions.

A central premise to the Study – beyond the importance of price delivery for automation – was that the “true price” is important to Providers and customers. The basis for this being that the customer should be able to get a correct answer to a seemingly simple question: what is my price for electricity right now? And ultimately that the “true price” should help influence customer usage (noting that was not tested in this Study).

Feedback in the Study and comments in the MIDAS<sup>1</sup> working groups support this premise: many Providers do very much care about this “true price”. However, implementing this reality is not straightforward. Today's rates require much more information beyond a simple rate, as well as

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<sup>1</sup> The Market Informed Demand Automation Server (MIDAS) provides access to utilities' time-varying rates, greenhouse gas emission signals, and California Independent System Operator (California ISO) FlexAlerts. MIDAS is the principal tool supporting the proposed load management standards. Amongst other things, the proposed standards would require the state's largest utilities and all community choice aggregators within their service area to populate the MIDAS database with time-dependent rates.

customer-specific information. Pre-calculating every combination of true price is not practical.

The ultimate solution may require a combination of both simplified rates and better authorization and delivery methods. A move towards standardized dynamic pricing may be the answer, noting that the authors believe there will be a long transition between the rates of today and such a future. The Study provided one view of how price delivery might work during this transition, and PG&E look forward to contributing to the evolution of all aspects of price delivery in the future.

#### **4. Next Steps**

PG&E will post the final report in the ETCC website next month.

### **III. Project Initiated in Q4 2023**

#### **A. Voice Automation Technology for Load Management Study Phase 2**

##### **1. Overview**

PG&E started to default residential customers to TOU rates in April 2021. Therefore, PG&E continue to expand the existing tools and technologies offered on its website to help customers understand new time varying rates. Similar to Phase 1 the objective of this DRET study is to leverage residential voice assistant technology (such as Amazon Alexa) and mobile app to educate residential customers on energy usage and bill forecasts, rates, TOU and RTP automation/optimization, and notification of utility events.

Customer engagement through Voice Assistants require the customer to have access to Amazon Alexa via speakers, display, and/or mobile app. Information was collected and processed from PG&E's internal rate engine and Share My Data (SMD) to a third-party system. The customer would then interact with a third-party system (Energy Expert) through their smart speakers, smart display, and mobile devices. The Energy Expert advised the customers to optimize their energy use based on the customer's rate schedule. In addition, the app provided customer notification such as Smart Days and PSPS events.

## **2. Collaboration**

The DRET team will partner with the internal customer care Pricing Product and Marketing teams to develop frequently asked questions (FAQs) that relate to TOU and load management. In addition, this mobile app has the capability to support the recently approved expanded RTP pilot. The DRET team will work with the pilot team on such collaboration when appropriate. PG&E hired the same third party to continue the development of the mobile app for this study.

## **3. Results/Status**

No results to share at this point.

## **4. Next Steps**

PG&E is in the process of contracting with the 3<sup>rd</sup> party vendor.

# **B. PG&E DRET RTP OpenADR 3.0 study**

## **1. Overview**

The California Public Commission Energy Division authorized a Hourly Dynamic Rate Pilot recently. In order to enhance the design of the dynamic rate pilot, the DRET program introduce a new study to gain lesson learned that can be applied to the dynamic rate pilot. This study will contract with an Automated Service Provider to bring small medium business customers into the dynamic rate using the recent developed OpenADR 3.0 specification. This study is intended to assist in accessing the cost and benefits of real-time rates, including required infrastructure, manufacturer interest, and customer impacts when using this new standard.

The technology used in this study will include a service control platform that helps building operators balance comfort with energy management. Wireless sensors, equipment controllers and user-friendly software are powered by machine learning to autonomously predict and efficiently control building loads to assist with renewable integration and reduce peak demand and energy consumption, as a result of responding to the hourly dynamic price.

## **2. Collaboration**

The DRET team will partner with the internal customer care Pricing Product teams to develop a hourly dynamic rate using OpenADR 3.0 standard. PG&E is planning to hire a automation service provider to recruit small and medium business customers into the study.

### **3. Results/Status**

No results to share at this point.

### **4. Next Steps**

PG&E is in the process of contracting with the 3<sup>rd</sup> party vendor.

## **IV. Ongoing DRET Projects**

### **A. Smart Electric Panel Lab Test**

#### **1. Overview**

In recent years, electric panel manufacturers have started to add connected technologies to traditional electric panels. These technologies include integrated or add-on software controls that provide customers with additional information and capabilities beyond a traditional panel.

Below are the objectives of the study:

- Evaluate smart panel installation difficulty
- Evaluate smart panel customer app functions
- Evaluate smart panel utility app functions
- Validate that the smart panel is safe to operate for field demonstrations

#### **2. Collaboration**

PG&E's DR Emerging Technology and PG&E's Applied Technology Service (ATS) teams jointly designed and will implement the test cases and procedures for the lab tests.

#### **3. Results/Status**

The ATS team installed two smart panels at its San Ramon location. The panels are connected to a load simulator, which may expand to real residential electric loads such as air conditioning, electric vehicles, and water heaters in the future. The team is currently developing test cases for the customer and utility apps.

#### **4. Next Steps**

The ATS team installed a new EV charger coupling with the existing smart panel. New testing will be done on how well the smart panel can respond to different demand response and load management use cases. In addition, the team identified a new smart panel from a different manufacturer for testing and comparison. This new smart panel is designed for SMB customers, therefore, new use cases will be developed in this area. The installation is scheduled in the second quarter and testing should be completed by the third quarter this year.

### **B. Residential load management software platform**

#### **1. Overview**

Home Energy Management system provides the functions and capabilities for residential customers to manage their energy use by behavior changes and/or automation through different energy end uses. The Study will assess residential customers' receptiveness and ability to perform load management with the support of a load management app, which serves as a home energy management system.

1. What is the effectiveness of emissions reductions messaging in:
  - Reducing household emissions
  - Shifting energy usage to off-peak periods
  - Engaging customers in load management awareness and education
2. What are the incremental load impacts of emissions reductions messaging to existing DR participants.
3. Can new communication protocol (e.g., Matter) be leveraged to automate load management measures.

#### **2. Results/Status**

The DRET team have contracted with a 3<sup>rd</sup> party software company to develop an advanced API to enable the residential load management software platform and app.

#### **3. Next Steps**

The DRET team will continue to develop the advanced API with the software company and scopes of work/contract with the residential load





management software platform company. Technology automation may be introduced to the software platform company's employees before rolling out to the general public.

## V. Budget

### 2024-2027 DRET Budget (Excluding VCE Pilot)

The following is a breakdown of the total expenditures for PG&E's 2024-2027 DRET budget. These values are based on accruals made each month. Values do not reflect commitments for projects, including those described in this report, which have been scoped and contracted for, but not yet executed.

<u>Approved 2024-2027 Budget</u>	<u>\$5,784,000</u>
<u>Budget Spent as of February 2024</u>	<u>\$13,618</u>
2024-2027 Budget Remaining	\$5,770,382