

## ***Data Analytics to Maximize Demand Response***

### **1. Overview**

This study was conducted to develop a data analytics tool that incorporates battery storage to maximize Demand Response (DR) programs enrollment and DR event participation. The key objectives of the tool are to drive up participation in Base Interruptible Program (BIP) and Capacity Bidding Program (CBP), allow SDG&E to analyze customer benefits from battery storage, understand the degree to which customers with battery storage can benefit from participating in DR programs, and identify which customers will benefit the most.

The scope was centered around six tasks:

- 1. Develop a prototype of the tool.** This was done by connecting a statistical computing package (Stata or Python) to Excel. The approach allows the DR programs to focus on defining the inputs, user options, outputs, and development of the computational engine. Because the tool relies on interval data analysis and simulation, it inherently needs to rely on a statistical computing package.
- 2. Apply the underlying code to the full population of non-residential SDG&E customers.** This was done for a preset number of scenarios. There are four main reasons to do so:
  - a) It helps assess how well the design works for the full target population (versus a handful of selected customers).
  - b) It allows the DR programs to analyze which type of customers benefit from BIP or CBP and specifically from battery storage under different designs/program.
  - c) It helps identify which customers would benefit most from battery storage and generate a list – ranking customers from those who benefit most to those who benefit least from battery storage plus DR (targeting).

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The analysis would include all customers not just those that currently have battery storage.

- d) It allows the DR programs to produce individual reports for customers and plot figures that can be uploaded to the tool website.

### **3. Run analysis to identify the characteristics of customers that benefit most from DR participation in BIP and CBP, plus customers with battery storage.**

The goal is to understand who benefits most and to enable SDG&E to direct aggregators and developers to them. SDG&E implemented two sets of analysis. The first analysis was based solely on factors observable by aggregators and developers – business type, square footage, location (climate zone). The second analysis incorporated information that required access to customer bills and load shape – e.g., concentration of load duration, load shape, ratio of energy to demand charges, etc.

- ### **4. Reporting and training.**
- As part of the project, the project team drafted a report (using the Statewide Emerging Technology report template), held bi-weekly progress meetings, and held an in-person workshop to present results and train users.

- ### **5. Development of an online website that allows customers to access the site-specific analysis implemented in Task 2.**
- The website contents sit behind a user management system, which requires customers to login and set a password. Only individuals with login credentials are allowed to view the results for a particular customer. This enables the DR programs to compartmentalize what to show to each user (e.g., the content for Gmail is different for different users). Because the analysis is static, it may need to be updated periodically (e.g., once a year) to remain relevant. The budget does not include costs for updating the analysis and website with new results.

- ### **6. Website module that provides the ability to run customer analyses.**
- This enables developers, aggregators, and/or sophisticated customers to upload interval data and customer inputs for individual customers or for a batch of customers.

## **2. Collaboration**

The progress and results have been shared with other CA IOUs ET-DR Leads. SDG&E's ET Team collaborated with its Demand Response

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Program Team to help them maximize their customer participation in CBO and BIP programs.

**3. Status**

The project has been completed, and the report has been published to the Emerging Technologies Coordinating Council (ETCC) website for public review and reference.