

TOU optimization study with smart technologies

1. Overview

The objective of this study is to evaluate if residential smart technologies, such as smart thermostat, can optimize TOU customers HVAC energy use in order to shift customers energy usage from peak to non-peak and potentially result in customers' bill saving. In the study, the technology should provide a "set it and forget it" experience for the customers. The study should analyze performance of smart thermostats, including:

- Enrollment rates for all three smart thermostat manufacturers, regardless of recruitment method, by recruitment mechanism
- TOU sign-up rates with email and push notification by vendor
- Estimate load impacts for each event overall and by smart thermostat manufacturers, TOU status, and TOU auto-programming
- Estimating the load impacts for each event called
- Estimate the TOU impacts on non-event days overall and by smart thermostat manufacturers, TOU status, and TOU auto-programming
- Estimate the enhanced energy savings for different smart thermostat manufacturers
- Compare DR load impacts for all three smart thermostat manufacturers
- Compare effectiveness between vendor's TOU optimization versus smart thermostat manufacturer's TOU optimization
- Comparison of automation capabilities for smart thermostat manufacturers to understand potential for load flexibility, shed, shape, and shimmy

2. Collaboration

The DRET team contracted with a third-party vendor who is familiar with residential smart technologies, manufacturers, and the market to implement this DRET study.

3. Results/Status

During the first and second quarters of 2021, the study recruited 13,350 customers to enroll in the pilot. The study also called six DR test events to measure the load impact from pilot participants.

4. Next Steps

The study will dispatch few more DR test events in the next couple of months. Depending on the amount of data collect by this study in 2021, the DRET team may consider extending the study to the end of 2022.