

SGIG Consumer Behavior Study Sacramento Municipal Utility District *SmartSacramento*[®]

Overview

Sacramento Municipal Utility District (SMUD) is a summer peaking municipal electric utility with ~600,000 customers in its ~900 square mile service territory that covers the Sacramento, CA metropolitan area. SMUD’s SGIG project (SmartSacramento) includes a consumer behavior study that evaluates customer acceptance and response to enabling technology combined with various time-based rates under different recruitment methods. The utility is targeting AMI-enabled residential customers across the entire service territory to participate in the study.

Consumer Behavior Study Features

Goals and Objectives—This study focuses on evaluating the timing and magnitude of changes in residential customers’ peak demand patterns due to exposure to varying combinations of enabling technology, different recruitment methods (i.e., opt-in vs. opt-out), and several time-based rates. SMUD is also interested in learning about customer acceptance of the different time-based rates under the alternative recruitment methods.

Treatments of Interest—Rate treatments include the implementation of three time-based rate programs in effect from June through September: a two-period TOU rate that includes a three-hour on-peak period (4 - 7 p.m.) each non-holiday weekday; a CPP overlaid on their flat underlying rate; and a TOU with CPP overlay (TOU w/CPP). Customers participating in any CPP rate treatments receive day-ahead notice of critical peak events, called when wholesale market prices are expected to be very high and/or when system emergency conditions are anticipated to arise. CPP participants will be exposed to 12 critical peak events during each year of the study.

Control/information technology treatments include the deployment of IHDs. SMUD is offering IHDs to all opt-out customers in any given treatment group and to more than half of the opt-in customers in the treatment group. All participating customers receive web portal access, customer support and a variety of education materials.

SMUD Rate Levels (¢/kWh)

Period	Flat w/CPP	TOU	TOU w/CPP
Base (<700 kWh)	8.5		
Base (>700 kWh)	16.7		
Off-Peak (<700 kWh)		8.5	7.2
Off-Peak (>700 kWh)		16.6	14.1
Peak		27.0	27.0
Critical Event	75.0		75.0

Sacramento Municipal Utility District *(continued)*

Experimental Design—Due to the variety of treatments, the study includes three different experimental designs: randomized controlled trial with delayed treatment for the control group, randomized encouragement design (RED) and within-subjects design.

In all three cases, AMI-enabled residential customers in SMUD’s service territory are initially screened for eligibility and then randomly assigned to one of the seven treatments or the RED control group.

For the two treatments that are included in the RCT “Recruit and Delay” study design, customers receive an invitation to opt in to the study where participating customers receive an offer for a specific treatment. Upon agreeing to join the study, customers are told if they are to begin receiving the rate in the first year of the study (i.e., June 2012) or in the summer after the study is complete (i.e., June 2014).

For two of the three treatments that are included in the RED, customers are told that they have been assigned to a specific identified treatment but have the ability to opt out of this offer. Those who do not opt out receive the indicated treatment for the duration of the study. Those who opt out are nonetheless included in the study’s evaluation effort but do not receive the indicated treatment. For one of the three RED treatments, customers receive an invitation to opt in to the study where participating customers receive a specific treatment. Customers that opt in are then assigned to receive the treatment in year 1 of the study (i.e., 2012).

For the two treatments that are included in the within-subject design, customers are told they have been assigned to either the Flat w/CPP treatment or the TOU w/CPP treatment with technology.¹ In the former case, customers only have the ability to opt in to this specific treatment. In the latter case, customers only have the ability to opt out of this specific treatment.

Enrollment Incentives and Retention Activities—None

Sample Size Requirements—Sample size requirements are shown in the table below.

Sample Size Requirements

Experimental Cell	Year 1 & 2	After Study Ends
TOU w/o IHD Opt-In RCT	1,178	1,178
TOU w/IHD Opt-In RCT	1,963	1,963
TOU w/IHD Opt-Out RED	1,240	n/a
TOU w/CPP w/IHD Opt-Out Within-Subjects	375	n/a
Flat w/CPP w/o IHD Opt-In Within-Subjects	188	n/a
Flat w/CPP w/IHD Opt-In RED	1,131	n/a
Flat w/CPP w/IHD Opt-Out RED	431	n/a
Control	37,682	n/a

¹ The within-subjects method was designed to use no explicit control group; instead it estimates the effects of the treatment for each participant individually, using observed electricity consumption behavior both before and after becoming a participant in the study as well as on critical peak event and non-event days. However, the control group selected for the RED design may be used as a control group.

Sacramento Municipal Utility District *(continued)*

Key Milestones

Key Milestones	Target Dates
Study begins	June 2012
Interim evaluation report submitted	April 2013
Study ends	September 2013
Final evaluation report submitted	January 2014

Contact Information

Lupe Strickland
Senior Project Manager
Sacramento Municipal Utility District
gstrick@smud.org

Recipient Team Project Website: www.smud.org/en/smartmeter/Pages/default.aspx