

Consumer Behavior Study Marblehead Municipal Light Department *Residential Dynamic Pricing Pilot Program*

Overview

Marblehead Municipal Light Department (MMLD) is a summer peaking municipal electric utility with ~10,000 customers (90% are residential) in its 4.5 square mile service territory that covers this coastal suburb north of Boston. MMLD’s advanced metering infrastructure project that was co-funded by SGIG includes a consumer behavior study that evaluated customer acceptance of and response to a voluntary flat rate with critical peak pricing (CPP) overlay and various forms of enabling control technologies. The utility targeted residential customers throughout the entire service territory to participate in the study.

Consumer Behavior Study Features

Goals and Objectives—This study focuses primarily on evaluating the timing and magnitude of changes in customers’ peak demand and energy usage patterns due to exposure to a flat rate with CPP overlay (Flat w/CPP). MMLD was also interested in assessing residential customer acceptance and retention associated with this type of rate design, as well as how that changed with the introduction of different enabling control technologies and experience with this rate design.

Treatments of Interest—Rate treatments included the application of a Flat w/CPP overlay that utilizes up to a six-hour period (12 – 6 p.m.) for critical events on non-holiday weekdays from June through August. Customers were notified of critical peak events, which were called in conjunction with ISO New England demand response events, by 5 p.m. the day before. Participants would receive notification of up to 12 critical peak events each year of the study.

All customers participating in the study received web portal access, customer support and a variety of education materials. All participants also had access to enabling technologies in the second year of the study to assist in controlling water heaters and air conditioners to better manage electricity bills and respond to critical peak events.

MMLD Rate Levels (¢/kWh)

| Period | Flat w/CPP |
|----------------|------------|
| Base | 9.0 |
| Critical Event | 105.0 |

Experimental Design—The design for the study involved a randomized controlled trial with delayed treatment for the control group. Residential customers in this small coastal suburb of Boston who met certain eligibility criteria received an invitation to opt in to a study where participating customers received the Flat w/CPP rate treatment, with the understanding that the application of this treatment could be delayed by one year. At this point, no mention of the enabling technology to be offered in year two of the study was provided. Customers who opted in were randomly assigned to either the rate treatment or their existing flat rate for summer 2011. Random assignment was done within stratification cells, defined based on customer data collected during a survey taken immediately after the opt-in decision. All participating customers received the rate treatment in the second year of the study (i.e., 2012).

Marblehead Municipal Light Department *(continued)*

In addition to the rate treatment, although no formal experimental design was applied, all participating customers who were eligible, based on survey responses, received an invitation in year 2 of the study to have a free water heater switch or PCT installed by a licensed contractor of their choice.

Enrollment Incentives and Retention Activities—Participating customers received bill protection that ensured that they would pay no more than what they would have paid under the existing flat rate during the first twelve months of participation in the rate treatment. Bill protection was removed after twelve months.

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

Sample Size Requirements

| Experimental Cell | Customers |
|---|-----------|
| CPP Rate Treatment in Year 1 and Year 2 | 250 |
| CPP Rate Treatment in Year 2 Only | 250 |

Key Milestones

| Key Milestones | Target Dates |
|-------------------------------------|--------------|
| Study begins | June 2011 |
| Interim evaluation report submitted | July 2012 |
| Study ends | May 2013 |
| Final evaluation report submitted | July 2013 |

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