

## SGIG Consumer Behavior Study Vermont Electric Cooperative *eEnergy Vermont*

### Overview

Vermont Electric Cooperative (VEC) is a winter peaking electric cooperative with ~34,000 customers in its ~2,100 square mile service territory that covers northern Vermont. This utility is part of the eEnergy Vermont SGIG project which includes two consumer behavior studies. This one evaluates customer acceptance of and response to a three-period, TOU rate with variable peak pricing component, enhanced customer service-based information feedback and various enabling technologies. The utility is targeting all residential customers throughout the service territory for participation in the study.

### Consumer Behavior Study Features

**Goals and Objectives**— This study focuses on evaluating the timing and magnitude of changes in customers’ peak demand and energy usage patterns due to exposure to a three-period TOU rate with variable peak prices, enhanced customer service-based information feedback and various types of enabling control and information technologies. VEC is also interested in learning about customer acceptance of the rate under customer service-based information vs. technology-based information.

**Treatments of Interest**— Rate treatments include the application of a three-period TOU rate with a variable peak pricing (VPP) component, where the peak period price changes hourly to reflect the ISO New England (ISO-NE) day-ahead market Vermont load zone locational marginal price of electricity for that hour. The definition of each period differs seasonally. During the summer months (April – September), the peak period covers weekdays and non-holidays 11 – 5 p.m.; the shoulder period covers weekdays and non-holidays 5 – 10 p.m.; and off-peak period covers all other hours. During the winter months (October – March), the peak period covers weekdays and non-holidays 4 – 8 p.m.; the shoulder period covers weekdays and non-holidays 11 a.m. – 4 p.m. and 8 – 10 p.m.; and off-peak period covers all other hours.

Control/information technology treatments include the deployment of IHDs, proactive customer service and home energy management systems.

VEC is augmenting the web portal access that all participating customers receive with IHDs or proactive customer service methods as various feedback channels to provide customers with consumption information and notification of peak events. VEC considered a full HEMS, including PCTs and/or other wireless devices that enable control of various plug-loads. Due to cost considerations, VEC decided to drop the HEMS control technology treatment from the study before recruitment began.

**VEC Rate Levels (¢/kWh)**

Period	VPP
Off-Peak	12.844
Shoulder	15.730
Peak†	19.168

\*Rate level represents an adder to the hourly ISO-NE Vermont load zone day-ahead locational marginal price, where the total applicable retail peak period electricity rate will be set at a minimum of 26.343 ¢/kWh .

**Experimental Design**— The design for the pilot is a randomized controlled trial with denial of treatment for the control group . A simple random sample of AMI-enabled residential customers in the service territory who meet certain

**Vermont Electric Cooperative** *(continued)*

eligibility criteria receive an invitation to opt in to the study where participating customers could receive one of several treatments, with the understanding that these treatments are limited in supply. Customers who opt in are then screened and surveyed to ensure that they qualify to potentially receive a treatment. Those who do are then randomly assigned to one of the three treatments or the control group. The pilot transitions all treatment customers from their existing flat rate to the VPP rate in May of 2013; all control customers will remain on their existing flat rate throughout the duration of the study.

Due to attrition problems experienced in the first few months of the study that led to questions about the comparability of the customers in the control group to the remaining pool of treatment customers, VEC decided to alter the experimental design. In order to provide the best opportunity to estimate sufficiently precise load impacts due to the VPP rate, VEC will be instituting a second study. All AMI-enabled residential customers in the service territory who meet certain eligibility criteria (i.e., excluding all of those customers who were exposed to treatment in the original study, but including the customers who were assigned to the control group) will receive an invitation to opt in to a new study where participating customers will be randomly assigned to either receive the VPP rate treatment starting in May of 2013 or remain on their flat rate (i.e., randomized controlled trial with denial of treatment for the control group).

**Enrollment Incentives and Retention Activities**— As an incentive to participate in the first study, those who completed the qualification survey, which dictated eligibility for the study, received an entry into a drawing for a free iPad. Neither incentives nor retention activities are undertaken in the second study.

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

**VEC Sample Size Requirements**

Experimental Cell	No IHD	IHD	HEMS
No Proactive Customer Service	n/a	377	222
Proactive Customer Service	698	359	n/a
Control	2,500	n/a	n/a

**Key Milestones**

Key Milestones	Target Dates
Study begins	February 2012
Interim evaluation report submitted	March 2013
Study ends	May 2014
Final evaluation report submitted	August 2014

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