

SGIG Consumer Behavior Study

Minnesota Power Company

AMI Behavioral Research Pilot

Abstract

Minnesota Power’s advanced metering infrastructure (AMI) behavioral research pilot is a consumer behavior study involving two phases. The first evaluates customer acceptance and response to different levels of resolution and timing of information feedback about their electricity consumption – monthly, daily, and hourly. The second phase evaluates customer acceptance and response to critical peak pricing.

Consumer Behavior Study Features

Goals and objectives for phase one center on how customers respond to varying types of information and specificity.

During the pilot, customers have access to usage information at different levels of frequency and resolution – monthly, daily, and hourly. The second phase involves determining

how customers respond to critical peak pricing (CPP) in terms of acceptance, retention, and load impacts.

Study design comprises a study sample of up to nearly 5,000 customers in Duluth, Minnesota and a test period from March 2012 to December 2013. The first phase is conducted using a Randomized Control Trial design; customers who opt-in to the study are randomly assigned to control and treatment groups. Participants in the second phase CPP pilot, assuming regulatory approval, are not being assigned to groups: all participants are being placed on the CPP rate. The number of customers in phase two will be based on solicitation responses, meaning customers must “opt in” to the rate to be included. Assessment of impacts from the rate will be made on how load profiles for individual participants differ between CPP days and non-CPP days with similar weather. The two primary test periods for impacts from the CPP pilot will be winter and summer 2013. Participants are being surveyed at both of these times for information regarding appliance holdings and use, attitudes, energy-related behavior, and satisfaction with the rate. In the event of unusual weather affecting the implementation of CPP events, it is possible to extend the test period through 2014. The pilot CPP rate is effective through April 2015.

Rate design involves a critical peak price that is overlaid onto a time-of-use rate. CPP events occur when heating and cooling usage are in high demand and are called when a major energy event is taking place in the market or on Minnesota Power’s system. CPP events are called a day ahead, and emergency events are called in accord with Midwest Independent Transmission System Operator (“MISO”) operations. Minnesota Power may declare a maximum of 150 hours of CPP periods per calendar year. Summer CPP periods are 12:00 p.m. to 3:00 p.m. and winter CPP periods are 6:00 p.m. to 8:00 p.m. Emergency CPP periods occur when MISO

At-A-Glance

Recipient: Minnesota Power

State: Minnesota

Timing: March 2012 – March 2014

Interim Evaluation Reporting: March 2013

Final Evaluation Reporting: March 2014

Sample Frame: ~4,800 residential

Number of Treatments: 1

Experimental Design: Randomized Control Trial

Rate Treatments

- Critical Peak Pricing
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determines the reliability of the system is at risk. The maximum length of an emergency CPP period will be capped at 8 hours.

Key Milestones

Key Milestones	Target Dates
Minnesota Power files CPP rate	January 2012
Minnesota Power recruits CPP participants	September 2012
Minnesota Power pilot test period ends	December 2013
Minnesota Power provides Final Evaluation Report	March 2014

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