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 unto 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...
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**

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<th>Key Milestones</th>
<th>Target Dates</th>
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<tr>
<td>Minnesota Power files CPP rate</td>
<td>January 2012</td>
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<tr>
<td>Minnesota Power recruits CPP participants</td>
<td>September 2012</td>
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<tr>
<td>Minnesota Power pilot test period ends</td>
<td>December 2013</td>
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<td>Minnesota Power provides Final Evaluation Report</td>
<td>March 2014</td>
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**Contact Information**

Tina Koecher  
Manager – Billing & Energy Efficiency  
30 W Superior Street, Duluth MN  55802  
Ph: 218.355.3805  Cell: 218.390.5295

Recipient Team Project Web Site: N/A