

Demand Response Collaborative Pilot Program Discussion

Consumers Energy

July 26, 2007

Background

21ST Century Energy Plan

- Demand response (DR) refers to customer efforts to reduce consumption (demand) in response to price signals, incentives, or directions from grid operators.
- Barriers to Adoption of DR Programs Include:
 - Ineffective customer incentives;
 - Absence of demand response and ancillary services markets;
 - Lack of wide-scale deployment of advanced metering & communications technologies; and
 - Lack of experience combining advanced technologies with effective time-based electric rate structures.

Barriers & Solutions

- Absence of demand response and ancillary services markets;
 - Midwest Demand Response Initiative Kick-off Meeting Feb 2007
- Lack of wide-scale deployment of advanced metering & communications technologies;
 - Detroit Edison and Consumers Energy are planning major AMI initiatives with “No Meter Left Behind” Strategy.
- Lack of experience combining advanced technologies with effective time-based electric rate structures & Ineffective customer incentives;
 - MPSC Demand Response Collaborative

DR Latest Developments*

- Pricing experiments continue to show that customers can and will respond to dynamic prices.
 - CA SPP, AmerenUE, Anaheim Peak Time Rebate.
- Combining enabling technology with price signals increases demand response.
- Getting customers to try time-varying rates remains a challenge.
 - Customers are risk adverse and tend to focus on the down-side risk
 - No political will to place customers on default dynamic rates
- Information feedback is showing promise
 - Hydro One Experiment on the impact of real-time information feedback on energy use averaged 6.5% reduction across all households.
 - Salt River Project has conducted a similar pilot.

* Stephen George, *Latest Developments in Dynamic Pricing and Advanced Metering Adoption*, Restructuring Roundtable, Feb, 9 2007.

Demand Response Pilot Objectives

- Test the interest of customers to various DR pricing structures;
- Determine the demand (kW) and energy impacts (kWh) associated with various pricing structures;
- Determine the most effective methods of providing pricing information;
- Determine the best methods to communicate prices and pricing plans;
- Assess the percentage and types of customers (demographics, end uses, energy usage) likely to participate in DR programs;
- Assess the impacts of enabling technologies (in-home energy display, programmable smart thermostat, smart appliances);
- Calculate elasticity of demand for various pricing structures;

Demand Response Pilot Ideas

Residential Customers

- Real Time Energy Information Feedback Pilot
- Critical Peak Pricing Pilot
- Critical Peak Pricing Pilot with Enabling Technology
- Critical Peak Pricing Rebate Pilot
- Critical Peak Pricing Rebate Pilot with Enabling Technology

Non-Residential Business Customers

- Several DR pilots are currently being researched at CE, unable to make a recommendation at this time.

Demand Response Pilot Ideas

Residential Customers

- Energy Information Feedback Pilot
 - AMI meters are capable of providing hourly energy usage information.
 - Unlikely that Michigan will require any type of mandatory variable rate pricing program that customers may opt out of.
 - Anticipate only 25% - 35% of customers will be on some type of variable rate option.
 - Need to determine the impacts of providing real-time or day after energy information to customers.
 - Assess the type of feedback customer find most useful
 - ◆ Pre Paid Energy
 - ◆ In-Home Displays
 - ◆ Web based Information Portals
 - ◆ May also want to have an "Information" treatment

Demand Response Pilot Ideas

Residential Customers

- **Critical Peak Pricing Pilot**
 - This pilot would test the concept of 4 pricing segments; Off Peak, Mid-Peak, On-Peak and Critical Peak without enabling technology.
- **Critical Peak Pricing Pilot with Enabling Technology**
 - This pilot would test the concept of 4 pricing segment: Off Peak, Mid-Peak, On-Peak and Critical Peak with enabling technology (Programmable Communicating Thermostat or Smart Switch).

Demand Response Pilot Ideas

Residential Customers

- **Critical Peak Pricing Rebate Pilot**
 - This pilot would test the concept of 4 pricing segments; Off Peak, Mid-Peak, On-Peak and Critical Peak with a rebate during critical peaks as opposed to penalty pricing but without enabling technology.
 - Requires the determination of a customer baseline.
- **Critical Peak Pricing Rebate Pilot with Enabling Technology**
 - This pilot would test the concept of 4 pricing segment: Off Peak, Mid-Peak, On-Peak and Critical Peak with a rebate during critical peaks as opposed to penalty pricing and with enabling technology (Programmable Communicating Thermostat or Smart Switch).
 - Requires the determination of a customer baseline.

Demand Response Pilot Ideas

Research Design Recommendations

- Classic Side-by-Side comparison of control vs test groups.
- Collection of interval information for pilot participants.
- 12 months of pre and minimum 12 months of post treatment interval data collection.
- Collection of Satisfaction, Appliance Saturation and Demographic information for test and control samples.
- Implementation of choice based research with residential population to determine market penetration levels of desired pilot programs.