Demand Response and Advanced Metering

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Residential Pilot

• Pilot testing innovative price response rates
• Three *voluntary* rate offerings –
  – Two tier time-of-use rate with high differentials (RTOU)
  – Flat rate subject to a critical peak pricing element (RCPP)
  – Two tier time-of-use rate with high differentials subject to a critical peak pricing element (RCTOU)
Pilot Participants

• Currently about 3,000 participants on pilot
  – Volunteered to participate
  – Denver metro area residential customers
  – With high summer electric use (>600 kWh monthly)
  – 60% randomly selected for tariff rates, 40% placed in a control group
Metering and Enabling Technologies

• All participants received meters that record interval data as well as monthly kWh or on- and off-peak data

• RCPP and RCTOU participants are notified by phone or email the day before a critical peak event so they can appropriately adjust their electric use

• Some RCPP and RCTOU participants were randomly selected to receive a load control switch or programmable thermostat that automatically manages their air conditioning use during critical peak periods
Preliminary Analysis

• Pilot rates effective July 15, 2006 thru July 14, 2007

• Preliminary load impact analysis from this past summer; includes six critical peak events called between mid-July and August

• Final analysis of Pilot available late 2007; will include load impact results thru July 14, 2007 and an analysis of the cost-effectiveness of price response rates
Preliminary Load Impact Results

• RCPP and RCTOU participants significantly reduced their load during critical peak periods.

• However, RTOU and RCTOU participants did not significantly reduce their demand during on-peak periods.

• Central air conditioning participants reduced considerably more demand during critical peak events than participants without central air conditioning.

• Participants with switches or thermostats reduced considerably more load during critical peak events than central air conditioning participants without enabling equipment.

• Switches and thermostats yielded comparable demand reductions during critical peak events.

• Price response rates appear to elicit an overall ‘conservation’ effect – with participants using less electricity over the summer.
Preliminary Conclusions

• ‘Dynamic’ or critical peak pricing elements appear to motivate customers to reduce demand

• Enabling technologies may be key to successful pricing structures with ‘dynamic’ elements

• Efforts should be focused on identifying cost-effective meter technologies that are compatible with dynamic pricing elements
Future Considerations

• Demand Response Goals
  – Reduced total demand??
  – Reduced peak load demand??
  – Mitigate price spikes??
  – Increase reliability??
  – More efficient use of current capacity??
  – Lower consumer bills??
  – Conservation??
Future Considerations

• Enrollment
  – Mandatory
  – Voluntary
  – Default with OPT Out

• Cost to Consider
  – Investments in meters and other infrastructure
  – Added administrative costs
  – Technology and data collection upgrades
  – Support for technology and data analysis
  – Consumer education and customer service
  – Costs to consumers in the form of inconvenience, price risk, or production interruption
Future Considerations

• Cost Recovery
  – Timing
  – Participant only
  – Socialized across all customers