

# 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