Demand Response and Energy Efficiency Programs
In the Deregulated Texas Electric Market

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AEIC Presentation – September 21, 2009
AGENDA

- Texas Deregulation Summary
- 2008 PUCT Substantive Rule Changes
- 2008 State-wide Demand Response Pilot Results
- CenterPoint Energy Efficiency Programs Overview
- C&I Load Management (Energy Share Program)
- Center for Commercialization of Electric Technologies (CCET) Demand Response Pilot
- DOE Stimulus Package Applications
  - CCET
  - City of Houston
Texas Deregulation

- Deregulation market opening – January 2001
  - Many thought TDU DSM would go away
  - It didn’t: SB 7 put requirement on TDUs to do DSM

- Energy efficiency plan included in 2001 deregulation rate case
  - New Senate Bill 7 energy efficiency programs
  - Phasing out of ongoing DSM Programs

- Competitive Energy Services rule
  - TDUs cannot offer DSM programs directly to customer
  - DSM has to be implemented by 3rd party providers
Senate Bill 7 and PUCT Substantive 25.181 Rules

- Established goal of 5% for 2002 and 10% for subsequent years of the utilities average growth over the preceding 5 years
- Administration cost not to exceed 10% of total program costs until December 31, 2003, and not to exceed 5.0% of the total program costs thereafter
- Energy efficiency and load management programs had to be cost effective
  - Avoided cost on capacity based on gas turbine generator at $78.50 per kW/year
  - Avoided cost on energy savings 2.68 cents/kWh
  - Ceilings based on customer classes:
    (i) 100% for hard-to-reach customers.
    (ii) 50% for other residential and small commercial customers.
    (iii) 35% for large commercial and industrial customers.
    (iv) 15% for load management programs
- Load management programs not to exceed 15% of the utility's total demand reduction goal.

Senate Bill 712 – May 2005

- R&D funding for up to 10% of energy efficiency budget
Ceilings raised for customer classes:
(i) 100% for hard-to-reach customers.
(ii) 50% for other residential and small commercial customers.
(iii) 35% for large commercial and industrial customers, except for load management programs which may not exceed 25%.

Incentive ceilings raised for load management targeted toward T&D constrained areas:
(i) Large Commercial and Industrial projects: 35%.
(ii) Residential and Small Commercial projects: 55%.

Load management programs not to exceed limit raised from 15% of the utility's total demand reduction goal to 30%
2008 PUCT RULE CHANGES

- House Bill 3693 enacted in May 2007 requiring significant changes to energy efficiency rules

- PUCT approved changes to Substantive Rule 25.181
  + Increased demand goal to 15% for 2008 and 20% in 2009
  + Energy savings goal established (20% capacity factor of demand goal)
  + Administration cost not to exceed 10% of total program costs
  + Allows R&D funding for up to 10% of total program costs
  + Excluded transmission service customers
  + Relief on energy efficiency and load management programs cost effectiveness calculation
    - Avoided capacity cost on gas turbine generator increased to $80 per kW/year
    - Avoided energy cost savings allowance at 5.5 cents / kWh
    - Ceilings for customer classes eliminated
  + Load management program ceiling based on the utility's total demand reduction goal eliminated
  + Enhanced cost recovery and provided a performance bonus
2009 Programs

- Large Commercial & Industrial SOP
- Residential SOP
- Hard to Reach Residential SOP
- Energy Share Large Commercial Load Mgmt SOP
- Low Income Weatherization Programs
- Energy Star New Homes MPT
- The Texas Score MPT
- Multi-Family Water and Space Heating MPT
- State-wide CFL MTP
- A/C Residential & Commercial Pilot MTP
- Retro-Commissioning MTP
ENERGY SHARE PROGRAM

- Objective: Reduce peak electric load through voluntary customer Load Management Standard Offer Program consisting of the following program elements:
  - June 1 – September 30
  - Maximum of four-hours for each curtailment
  - Minimum of 2 and maximum of 4 curtailment calls (maximum of 16 hours)
  - Must respond within one hour from notification
  - Minimum of 750 kW aggregate peak and a minimum of 100 kW per participating site and average 250 kW per site

- Targets large commercial accounts with IDR meters

- Incentives:
  - Capacity fixed payment at $40 per kW / year
    - $15 per kW / year payment within 45 days of first scheduled curtailment
    - $25 per kW / year in November after verification of curtailment event(s)
In the initial year of 2008, the 10 MW goal was exceeded by a verified 15.8 MW participation.

Achieved 33.1 MW during a two-hour test curtailment on June 4, 2009.

19 customers are participating in the 2009 program.

Projected Program Demand Savings:

<table>
<thead>
<tr>
<th>Year</th>
<th>Goal</th>
<th>Current Status</th>
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</thead>
<tbody>
<tr>
<td>2009</td>
<td>31.25 MW</td>
<td>33.1 MW</td>
</tr>
<tr>
<td>2010</td>
<td>70.0 MW</td>
<td>-</td>
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ENERGY SHARE PROGRAM M&V

- **Baseline**: Combination of data from the day of curtailment and the four prior for weekdays, as follows:
  - On the day of curtailment, the average kW during the one-hour period that begins two hours before the start of the curtailment will be computed.
  - On the four previous weekdays, the daily averages of the demand recorded throughout the same time period as the curtailment will be computed.
  - The average kW demand over all hours during these five periods shall establish the baseline for each curtailment.

- **Curtailment Period kW**: The average kW throughout the curtailment period is subtracted from the Baseline to determine the Demand Savings for that curtailment event.

- **Demand Savings**: Performance payment will be based on the results of unscheduled curtailments derived from the average verified Demand Savings of all of the curtailments during the summer peak demand period.

- In the event no unscheduled curtailments occur, the demand savings used to calculate the performance payment will be the verified demand savings from the yearly scheduled test curtailment.
CCET MEMBERS

CCET is a Texas Non-profit Corporation

- Formed in Sept 2005 by Five Members (CNP, TXU ED (now Oncor), AEP Texas, Freescale & TxCee)
- Now 20 Members with Texas Operations
CCET DEMAND RESPONSE PILOT

Demand Response Pilot Participants

- 500 residential homes within advanced meter footprint
  - CenterPoint Energy with Comverge as load control service provider (LCSP)
  - Oncor Electric Delivery with Corporate Systems Engineering and Current Communications as LCSP vendors
- Three Retail Electric Providers (REPs) in each service area
  - Direct Energy
  - Reliant Energy
  - TXU Energy

Pilot Objectives:

- Demonstrate that demand response (DR) technology can be cost-effectively implemented for residential customers leveraging AMS and intelligent grid technology.
- Demonstrate that market participants can work together to achieve mutual benefits.
- Measure and verify DR data to determine energy and demand impacts of demand response offerings and allow estimates of the potential market size.
- Recommend appropriate changes to the PUCT and to ERCOT’s Protocols that would enable the ERCOT market to better recognize the value of demand response programs for residential customers.
- Examine the economic market effects of hypothetical large-scale demand response programs in ERCOT to inform policy-makers and market stakeholders of the benefits associated with pursuing the recommendations resulting from this study.

Technologies: Two-way communications to remotely controlled smart thermostats and load control devices

- ZigBee enabled Home Area Network (HAN) in CenterPoint Energy service area
- HomePlug enabled HAN in Oncor ED service area

Incentives: As offered by REPs
CCET DEMAND RESPONSE PILOT FINDINGS

- This pilot has demonstrated that providers of the latest technologies can dispatch curtailments via BPL networks, thermostats can be controlled, and information may be provided back to the dispatcher.

- Three major Retailers were not able to enroll the 500 customer goal for each of the Oncor ED and CenterPoint Energy service areas
  - Only 133 customers in CenterPoint Energy’s service area
  - Only 213 customers in Oncor ED’s service area

- Pilot shed light on significant challenges that must be addressed if residential direct load control, or other demand-side peak load management programs like it, is to be implemented on a large scale in Texas
  - Establishing market participant roles and responsibilities resulted in lengthy delays and in multitude legal contracts
  - Difficulties in advanced metering interfaces and verifying the actions of residential energy consumers
  - Reliance upon a market settlement system that uses average load profiles to estimate the temporal usage of smaller energy consumers
  - Experienced a severed value chain - distribution utilities, retail electric providers, and ERCOT system operators all recognize some value from demand response but the value enjoyed by any single entity may be insufficient to justify the sponsorship of a demand response program.
DOE STIMULUS - CCET APPLICATION

- Integrate demand response residential resources at the Discovery Spring Trails subdivision with advanced meter and smart grid technologies.

- Demonstrate the management of future wind resources for a large new master planned residential community deploying:
  - use of ultra-high efficient appliances and building shells
  - distributed and renewable energy resources
  - community and household energy storage
  - plug-in hybrid electric vehicle (PHEV)
  - demand response
Provide a central energy management and control center of its key facilities that leverages CenterPoint Energy’s advanced meter and smart grid technologies.

The energy management and control system’s primary focus will include:

- **Energy cost savings** – Measure the cost savings in monitoring and tracking demand and energy usage reductions resulting from more effective management of City of Houston facilities.

- **Emergency response** – The City of Houston would more actively coordinate long term planning of infrastructure improvements with CenterPoint Energy, such as in outage detection and recovery capability during major catastrophic events (e.g. hurricanes), provide CenterPoint Energy a load curtailment option during distribution system congestion/overload conditions, and mitigate "rolling blackouts" requested by ERCOT (ISO).

- **Demand Response** - The City of Houston will establish a working business model with Texas market participants to facilitate demand response programs which would result in energy cost savings to the City.
SUMMARY

- PUCT mandated energy efficiency goals continue to be increased.
- Traditional SOP and MTP may be approaching saturation levels.
- Need for demand response and emergency load management programs continues to grow.
- With advanced meter mass deployment, what future load profiling capabilities should be considered in transmission and distribution utility’s load research and planning tool box?