Three Utility Approaches to Gas Demand Response

Moderator Brett Feldman – Navigant
Wednesday 14 November, 2018
Gas DR Panelists

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Con Edison

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National Grid

Andrew Nih
SoCalGas
Gas Demand Response Pilot

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Background

Con Edison Peak Day Natural Gas Consumption
(weather normalized)

- 2001-2011 Compound Annual Growth Rate: 1.9%
- 2011-2017 Compound Annual Growth Rate: 4.7%
Objective: Incentivize customers to reduce natural gas demand during the coldest days of winter

Customers can participate by:
  – Switching from gas to electric or CE steam
    OR
  – Curtailing gas consumption for all or a portion of the event day

Approved Timeline: 2018/2019 winter season with an initial 3-year offering
Pilot Eligibility

- Firm service
- Minimum enrollment value: 50 Therms
- All Customer segments
- Interval metering: One hour readings
- No fuel switching to liquid fossil fuels
Eligible Zones

• Zones A and B are eligible
  – Zone A:
    • Rye/White Plains
    • North Bronx
    • North Manhattan
  – Zone B:
    • Queens
    • Southern Manhattan
### General Rules

<table>
<thead>
<tr>
<th>Capability Period</th>
<th>November 1 - March 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Trigger</td>
<td>18 F</td>
</tr>
</tbody>
</table>
| Notification Time          | Day-ahead: 21 hours in advance  
                           | Day-of: 2 hours in advance |
| Call Window                | 24-hour period (10:00 a.m. to 10:00 a.m.) |
SoCalGas Gas DR: Smart Thermostat DR Impact Evaluation

Andrew Nih
Background

• Demand Response developed as a support tool in response to on-going unexpected operational limitations on SoCalGas’ system that could affect system reliability.

• Factors Include:
  • System Capacity
  • Flowing Supply
  • Storage Supply
  • Weather Forecast
  • Demand Forecast
2017-2018 Winter Program Summary

Program Strategy
• $50 for enrolling in the program
  • $25 for staying in the program
• Lower temperature setpoints up to 4 degrees
  • No penalty for overriding adjustments
• Events:
  • 5am-9am
  • 5pm-9pm

Participation Results
• 9,200 customer enrollments
  • 10,800 thermostats enrolled
• 13 events called within 2 weeks (2/20 - 3/2)
  • 4 days with multiple events called
• On average, 60% of customers had full participation
  • 40% of customers overrode adjustments
### Load Impact Results

<table>
<thead>
<tr>
<th>Event</th>
<th>Average Impact</th>
<th>Impact %</th>
</tr>
</thead>
<tbody>
<tr>
<td>5am-9am</td>
<td>0.032 Therms</td>
<td>18.2%</td>
</tr>
<tr>
<td>5pm-9pm</td>
<td>0.012 Therms</td>
<td>10.7%</td>
</tr>
</tbody>
</table>
Gas Demand Response

Paul Wassink
Senior Engineer
Program Overview

- Determine
  - Firm C&I interest
  - Distribution system benefits and response
  - Scalability

- Design
  - Events coincident with system peak (6AM-9AM)
  - Max of 6 events per year
  - Direct Load Control (DLC)
  - Capacity commitment based on nameplate data

- Data
  - KYZ-pulse data
    - Site gas meter, not necessarily equipment level
  - 1-minute usage interval, uploaded every 5 minutes via cellular connection
Results – System Data

Pressure Governor

Delta PSIG (normalized to 0 at midnight)

Hour of Day

-10.0 -8.0 -6.0 -4.0 -2.0 0.0 2.0 4.0

Dec 26 - 42 HDD
Dec 27 - 47 HDD
Jan 8 - 47 HDD
Jan 16 - 40 HDD
Jan 17 - 44 HDD (DR Event)
Jan 18 - 46 HDD
Jan 19 - 40 HDD

HERE WITH YOU. HERE FOR YOU.
Business Model/Scalability

- Healthy customer interest exists (within our pilot budget)
- Reduction of 25-50% of nameplate capacity is possible thanks to short event length
  - Initial results are encouraging that DR can positively impact system
  - Will use data from all programs to verify results
- Possible to use demand respond to create a more dynamic, flexible gas system to better serve our customers’ needs
  - DR providing data and a new perspective for discussing system modeling and load planning
Panel Discussion

Charles Umberger
Con Edison

Paul Wassink
National Grid

Andrew Nih
SoCalGas
Gas DR Pilot CBL Example

24 Hour Baseline Example A

24 Hour Baseline Example B
Results – Site-level Data

- Different customers have vastly different usage profiles
- Charts show usage (ccf) over a period of 1-week (3/19-3/26)
- This data is from a period after the end of the DR season
# Incentive Rates

<table>
<thead>
<tr>
<th></th>
<th>Zone A</th>
<th>Zone B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservation Payment Option</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reservation Payment Rate ($/therm/month)</td>
<td>$9</td>
<td>$5</td>
</tr>
<tr>
<td>Performance Payment Rate ($/therm/event) for Planned Events and Test Events</td>
<td>$1</td>
<td>$1</td>
</tr>
<tr>
<td>Performance Payment Rate ($/therm/event) for Unplanned Events, Holidays, Planned Events Called in 3 or More Consecutive Days</td>
<td>$2</td>
<td>$2</td>
</tr>
<tr>
<td><strong>Voluntary Payment Option</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reservation Payment Rate ($/therm/Month)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Performance Payment Rate ($/therm/event)</td>
<td>$2</td>
<td>$2</td>
</tr>
</tbody>
</table>
# Incentive Example

## Reservation Rates ($/Therm/ month)

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<td>A</td>
<td>$9</td>
</tr>
<tr>
<td>B</td>
<td>$5</td>
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</table>

## Performance Rates ($/Therm)

<table>
<thead>
<tr>
<th></th>
<th>All Reservation</th>
<th>Holiday /3 consecutive days</th>
<th>Voluntary</th>
</tr>
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<td>$1</td>
<td>$2</td>
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## Annual Gas DR Revenue

Example: 100 Therms Enrolled

- **Zone A**: $4,500
- **Zone B**: $2,500
SoCalGas 2018-2019 Winter Program

• Expand program to include other thermostat manufacturers

• Target 50,000 enrollments

• Test out different control strategies:
  • Lower temperature adjustment to lower snapback
  • Breakout customers into two segments to maximize load reduction
  • Engagement with customers to prevent overriding of temperature setpoints
  • No notification to customers of pending events
Business Model/Scalability

- Four programs underway
  - Massachusetts – Study of gas DR potential with Fraunhofer Center for Sustainable Energy
  - Rhode Island – EE program (5-10 sites for 50 DTh/hr. reduction)
  - Downstate NY – planning for year two of three year pilot (16 facilities, 192 DTh/hr.)
  - Upstate NY – reduce East Gate peak by 1% (20-40 customers, 200 DTh/hr.)

- Utilities can still add value for gas DR development
  - Value stack still not fully understood
    - BCA development ongoing
  - Gas utilities can capture additional value by embracing innovation
Questions from the floor

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