Eversource Connecticut
DR Pilots Overview and Status

Demand Resources in New England
Informational Meeting

October 27, 2016

Eversource Demand Strategy

EVERSOURCE ENERGY

- Understand demand issues holistically
  - Address peak demand issues and timing at the ISO-NE level as well as peak demand issues at the feeder and substation levels
  - Understand the full range demand needs of customers and implement a portfolio of solutions to meet those needs
    - Demand reduction measures, demand response enabling and demand saving through traditional energy efficiency measures
  - Develop customer personas, that represent classes of customer types, pilot various approaches to meet their demand needs and use persona channels to scale delivery based on lessons learned from the pilots

Customer Engagement/Demand Needs

- C&I Pilot
  - The C&I Pilot is designed to assess customer demand needs based on energy usage profiling and demand duration characteristics
  - **Business personas**, which define common usage and demand characteristics, are used to segment the customers and will help with future scaling of technical lessons learned from the pilot
  - Meeting demand related needs of individual customers will be addressed with:
    - 1) active demand reduction controls
    - 2) demand response or
    - 3) more tradition energy efficiency related measures with that have demand impacts or enable demand control (e.g. lighting controls and VFDs)

DR Pilot Status - C&I - SEGMENTS

- Persona selections and status
  - **Large Commercial – Hospital/Office:**
    - As of 10-12-16 one hospital has been audited, assessed and formally offered a project. Customer did not move forward.
    - **Plan is to engage and assess a large office before year end.**
  - **Mid-Market – Manufacturing:**
    - As of 10-12-16 one manufacturer has enrolled in the program and **project installation is in final stages**
  - **Small Commercial – Restaurant or Small Box retail:**
    - As of 10-12-16 one small box retail store has been assess and offered to enroll – **Pending customer signature on project agreement**

➔ **Customers that are already enabled with energy efficiency or have state of the art controls system <u>are</u> eligible for participation**

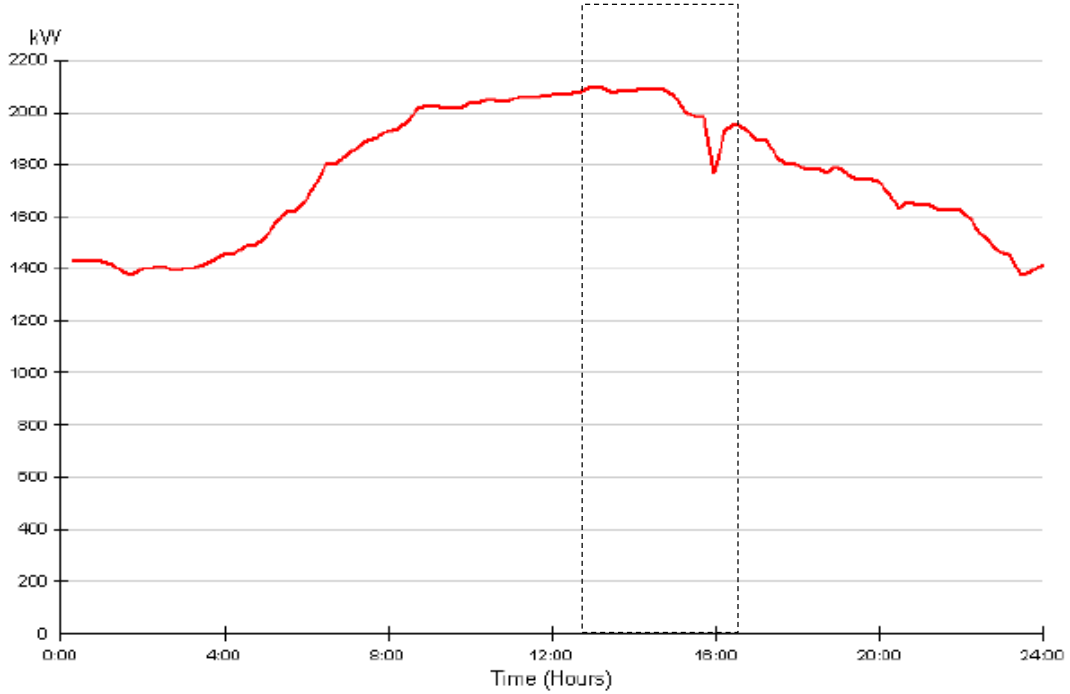
Participant Quantities and Milestones

- **Testing Advanced Control Technologies**
  - Up to the following participants:

    Ready for Summer of 2017

    - 3 Large (> 700 kW)
    - 5 Mid (300 - 700 kW)
    - 5 Small (100 - 250 kW)
- **Timeline**
  - 2017 (Fall) ➔ Report results from Summer 2017
  - 2018 (Summer) ➔ Additional testing based on results of 2017 operations
  - 2018 (Fall) ➔ Create strategy for 2019-2021 EE Plan

Large Commercial – Hospital:
Status: Offer to Customer



6-23-15 (Peak day for this hospital)

Hypothesis: Peak is consistent with the ISO Peak hours 1 pm to 5 pm, but not the ISO peak month and hours. Load is flat throughout the day. Cooling, motors and lighting are a major players in the load.

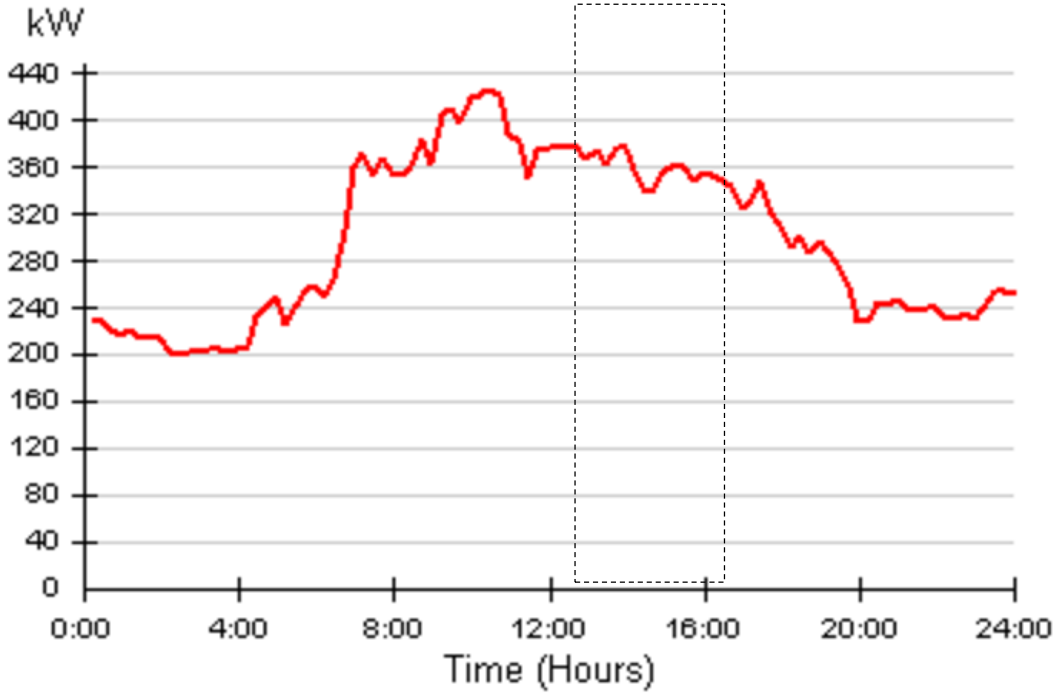
Proposed Approach: Implement Advanced/Smart energy management controls that sense, provide feedback and use algorithms to monitor demand and provide persistent peak DEMAND REDUCTION without disrupting critical electric end-uses.

Integrating of the automated demand controls will provide the facility operators with a way to familiarize themselves with the demand control concept and facilitate their adoption of behavior measures that further reduce peak load.

Benefit: Estimated results are a peak demand reduction of 40 kW active, 57 kW behavioral and a demand charge reduction of an estimated $7,705/year.

1) **Demand Reduction –YES**
2) **Demand Charge savings - YES**
3) **Demand Response - NO**
4) **Demand Response Payment - NO**

Mid-Market – Manufacturing:
Status: Installation Phase



9-9-16 (Peak day for this manufacturing Customer)

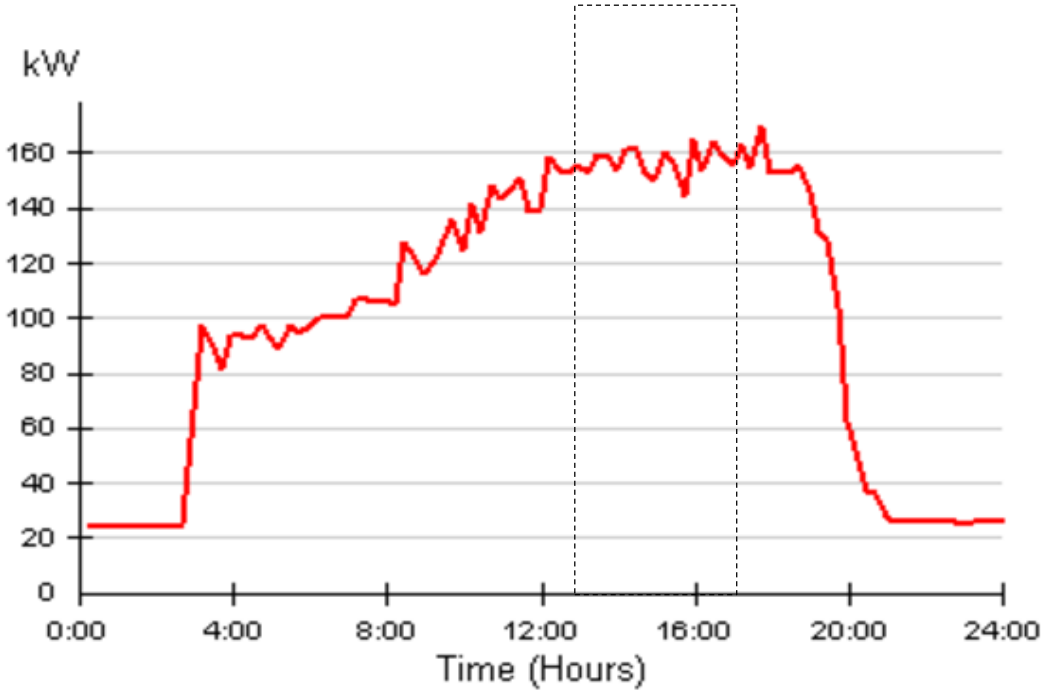
Hypothesis: Demand Monitoring manufacturing operations can have a significant impact on the billed peak demand of customers associated with this persona. Experience with demand reduction technologies for HVAC and demand monitoring can help define operational changes that lead to responsive demand capabilities.

Proposed Approach: Start with HVAC demand control and assess manufacturing operations, with demand monitoring for application of advanced and smart energy management controls with sensing and feedback algorithms to produce responsive demand capabilities. Apply EE Strategies to further address Peak Demand.

Benefit: Estimated results are a peak demand reduction of up 101 kW peak demand ($10,045/yr savings) from HVAC and demand monitoring to develop potential for responsive demand capabilities. Currently in the Installation phase.

1) **Demand Reduction –YES**
2) **Demand Charge savings - YES**
3) **Demand Response - TBD**
4) **Demand Response Payment - TBD**

Small Commercial: Small Box Retail
Status: Assessed and Offer Made



9-9-16 (Peak day for this Small Box Retail)

Hypothesis: Peak is not consistent with the ISO Peak hours. Roof Top AC units are controlled by thermostats. By using advanced thermostat controls, in small-commercial buildings with multiple zones, summertime peak demand can be cost-effectively reduced without impacting thermal comfort.

Proposed Approach: Implement Advanced Thermostatic Controllers to manage Roof Top AC units and to cost effectively enable Demand Reduction capabilities. Also use demand monitoring to assess and develop possible responsive demand capabilities (Demand Response).

Benefit: Estimated results are a peak demand reduction of 27 kW ($1,145/yr savings) from HVAC and demand monitoring to develop potential for responsive demand capabilities. Offer make to customer.

1) **Demand Reduction –YES**
2) **Demand Charge savings - YES**
3) **Demand Response - TBD**
4) **Demand Response Payment - TBD**

Residential - Active Demand Reduction Control Pilots

- **Wi-Fi Thermostat Pilots**
  - Technology transforms central A/C, air source heat pump, or ground source heat pump into smart networked device
  - Demand reduction events based on ISO-NE peak demand models, weather, pricing signals & local electric grid issues
  - Typical duration: four-hour period
  - Both pilots plan to enroll 2,000 units
  - Flat rate dispatch payment of $25/year/qualified thermostat
  - Eversource: Conducted small test demand reduction event in 2016 prior to 2017 pilot launch
    - Three events conducted on 9/22, 9/23, and 9/26 on three CAC units with ecobee wi-fi thermostats
    - Customer pre-event (and post) notifications and event dispatch were successful
    - Able to demonstrate control by switching off the cooling equipment.
    - Initial test identified some customer self-installation challenges, which are informing plans for 2017 enrollment

Residential - Active Demand Reduction Control Pilots (cont.)

- **Smart Plug w/ Rainforest Load Control Pilots**
  - Test impact of plug-based technologies to room A/C units (potentially dehumidifiers and pool pumps)
  - Pilot model: smart outlet, remote control unit & cloud-based networking
  - Demand reduction events based on ISO-NE peak demand models, weather, pricing signals & local electric grid issues
  - Typical duration: four-hour period
  - Flat rate dispatch payments: $20/participation year/qualified smart plug (maximum 2 per home)
  - Eversource: Enroll 1,250 Room A/C units by Summer 2017. Conducted small test demand reduction event in 2016 prior to 2017 pilot launch
    - 8/10 installations were successful
    - Customer pre-event (and post) notifications and event dispatch were successful
    - Able to demonstrate control by switching off the cooling equipment.