

PA Demonstration Offering Update

EEAC

November 15, 2017



**BLACKSTONE
GAS COMPANY**



**Columbia Gas[®]
of Massachusetts**
A NiSource Company

EVERSOURCE

 Liberty Utilities

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 **Unitil**
energy for life

2016-2018 Demonstration Projects



PA	Residential	C&I		
		Small	Mid	Large
National Grid	<ul style="list-style-type: none"> WiFi Tstat DLC (Central A/C) 	<ul style="list-style-type: none"> WiFi Tstat DLC 	<ul style="list-style-type: none"> WiFi Tstat DLC 	<ul style="list-style-type: none"> Interruptible load approaches
Eversource		<ul style="list-style-type: none"> WiFi Tstat DLC EMS Lighting/HVAC controls 	<ul style="list-style-type: none"> Software & Controls Batteries Thermal storage Onsite training Process audits 	<ul style="list-style-type: none"> Software & Controls Real time info Batteries Thermal storage Demand response On-site training Process audits
CLC	<ul style="list-style-type: none"> WiFi Tstat DLC (Central A/C) Behavioral DLC on DMSHP 	<ul style="list-style-type: none"> BTM thermal storage 	<ul style="list-style-type: none"> BTM thermal storage 	
Unitil	<ul style="list-style-type: none"> Battery Storage for existing solar PV systems 			<ul style="list-style-type: none"> Operations Changes to Reduce Demand (Not Approved)

Key

DLC – Direct Load Control
DMSHP – Ductless Mini-Split Heat Pumps
BTM – Behind the Meter
EMS – Energy Management System

- **Black Text** – 2016 Projects that have been evaluated and will continue in 2017 and 2018.
- **Blue Text** – Approved 2017 and 2018 projects.
- **Red Text** – New Demonstrations approved on October 30, 2017 – Timeline for each Demo is Pending; *Italics* – integrated demonstrations starting in 2017.
- **Green Text** – Proposed Demonstrations pending before Department

Eversource and Unitil Demonstration Orders



On October 30, 2017, the Department issued Orders addressing the proposed Eversource and Unitil Demonstration Offerings, which the Council supported in its October 2016 Resolution.

- Department approved:
 - Eversource's C&I battery storage, thermal storage, software and controls, and active demand response projects.
 - Unitil's residential battery storage projects.
 - Timelines for implementation of these demonstrations are being developed.
- Department did not approve:
 - Unitil's C&I demand response projects, due to scale.
- Department's Orders also:
 - Established a standard of review for demand demonstration projects.
 - Confirmed that any new energy efficiency demonstration project requires EEAC review and Department review and approval prior to implementation.
 - Determined that the MTM budget flexibility does not apply to demonstration projects and any increase in demonstration project budgets requires Department approval.
 - Directed all Program Administrators to develop methods for identifying, calculating, and monetizing the potential benefits of deferred and avoided transmission and distribution capital costs and other distribution benefits for demand projects (addressed more in cost-effectiveness presentation).



Cape Light Compact

2017 Demand Response Demonstration Offering Update

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Planned Offering Overview



- CLC included a DR Demonstration Offering in 2016-2018 Plan
 - Residentially-focused
 - Offered participants a WiFi thermostat and energy monitoring equipment, monitored/controlled via app and/or web
 - Direct Load Control (DLC) program - Participants' thermostat set points automatically adjusted during DR events called by CLC
 - 4-hour events (most called 2-6 pm)
 - Events called based on weather and ISO load predictions
 - Participants notified of events via email on day before
 - Offering goal: Learn how to best engage residential customers in demand response, use experience to inform further DR program development

2017 – Changes from 2016



- **Overall – expansion and streamlining**
 - Events called on opt-out basis only
 - Notification – morning of event day
 - via email and in-app message
 - Incorporation of mini-split DLC device and new thermostat model
 - Elimination of energy monitoring equipment
 - Simplification for participation incentives
 - Enrollment incentive plus “performance” incentive
 - Events called based on peak day probability

2017 Results



- 7 DR Events called July - August
- 40 participants
 - 22 thermostat participants, 18 mini-split participants
 - All new enrollments were mini-splits
- 116 participant events (participants x events triggered)
- 192 device events (devices x events triggered)
- 1 event opt-out

2017 Takeaways



- Important to incorporate DLC for mini-splits when targeting air conditioning load
- Be ready by June 1
 - Peak day was June 13, early by historical standards
- Must actively re-recruit past participants
- Weather is the driver – varies year-to-year
- At program scale, will need to recruit already-installed thermostats
 - Must carefully consider which thermostat model(s) to incorporate in to platform

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2017 Demand Response Demonstration Offering Update

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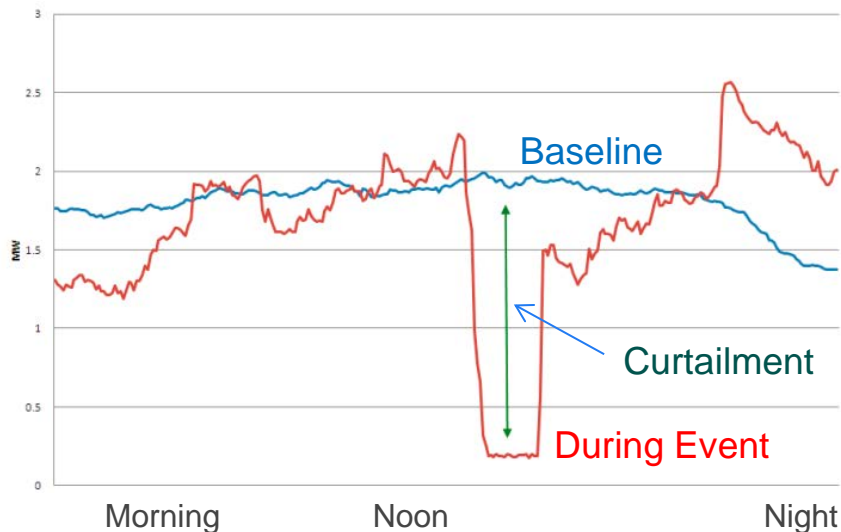
Planned Offering Overview



- National Grid included a DR Demonstration Offering in the 2016-2018 Plan
 - Residential demonstration with a target of 2.6 MW of peak demand reduction
 - C&I demonstration with a target of 41 MW of peak demand reduction

Commercial and Industrial Customers

“Performance Based” – Customer Incentive of about \$35 per kW per Year



Residential and Small Commercial Customers

“Pay for Connected Device” – Customer Incentive of about \$30 per Thermostat per Year

Supported devices so far



Honeywell



ecobee



Nest

Update for Large C&I Customer Demonstration



Enrollment

- Enrolled 20.6 MW
- Enrolled 98 Customers

Performance

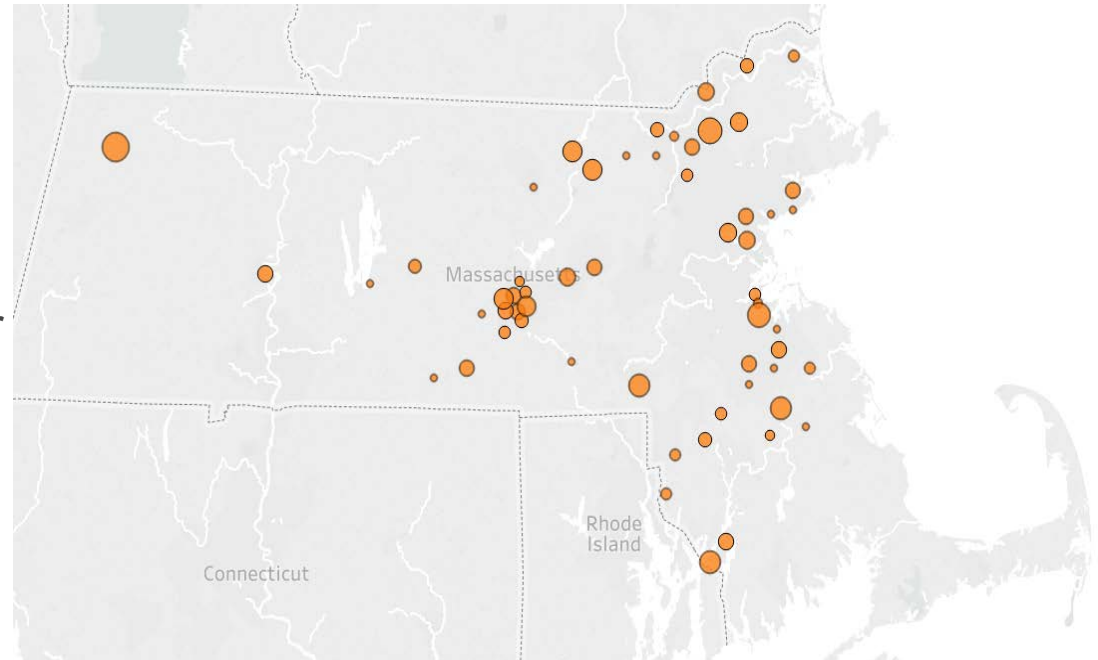
- Called 2 Events this Summer

Results & Evaluation

- Evaluator Calculating Customer Performance
- ETA: End of November

Improvements for Next Year

- Enrolling more customers & MW
- Streamline Incentive to simply \$/KW-yr to simplify communication to customers
- More Training for Sales Representatives
- Will allow generators, cogen, and existing FCM Participants to expand pool of potential customers



Update for Residential Demonstration



Enrollment

- Enrolled ~2 MW
- Enrolled 4,800 Wifi TStats
(170% increase from Sept. 2016 – mainly through OEM marketing outreach)

Performance

- Called 9 Events this Summer

Results & Evaluation

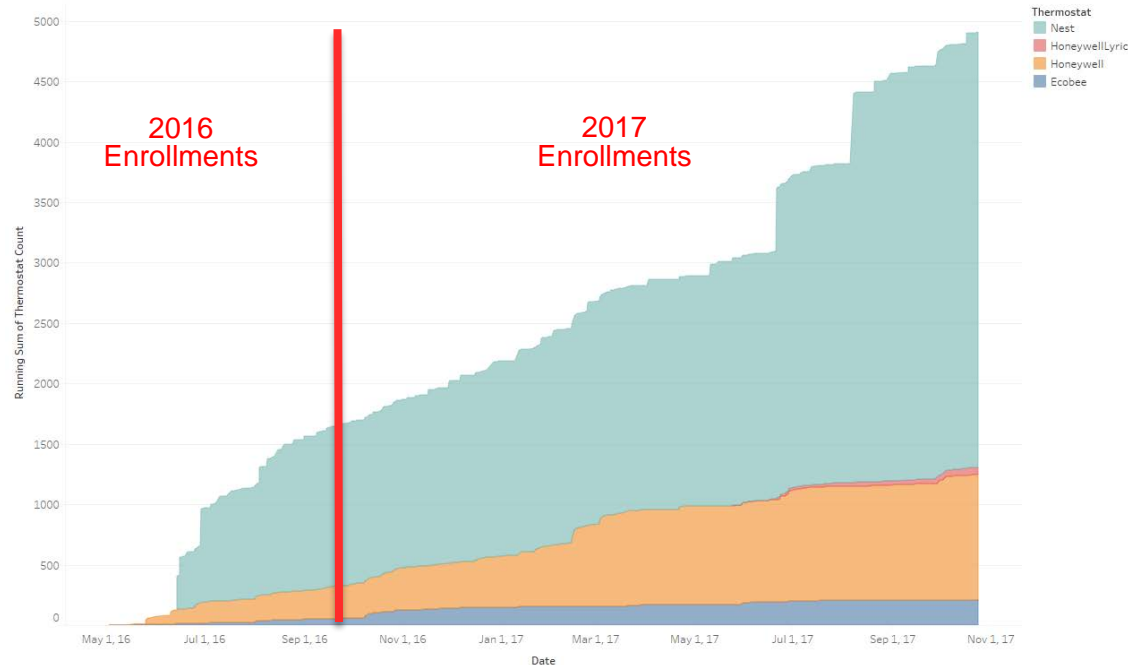
- Evaluator Calculating Customer Performance
- ETA: End of January 2018

2017 Implementation Updates

- Assessed new-to-market connected devices and determined there was not a sufficient population to warrant investment, at this time
- Focused on connected devices with near-term potential using logical investment criteria approach

Improvements for Next Year

- Reduce Cost Through Competitively Procured Contracts with demand response management system (DRMS) vendor and device vendors



Preliminary Results of Residential Demonstration



PRELIMINARY FINDINGS

Participation Status	2016	2017
Full participant	66.0%	68.5%
Opt-out	19.6%	15.1%
System off/heat	10.8%	13.2%
Failed	2.2%	1.8%
No connectivity	1.3%	1.4%

- Connectivity improved slightly from 15.8% to 13.5%
- Navigant's 2017 reclassification based on system mode shifted about 20% of thermostats from full participants to non-participants

Participation Status Definitions:

Full participant

- Thermostat used the efficient DR setpoint, or a more efficient setpoint for the full event

Opt-out

- Thermostat actively opted-out of an event, either before or during the event

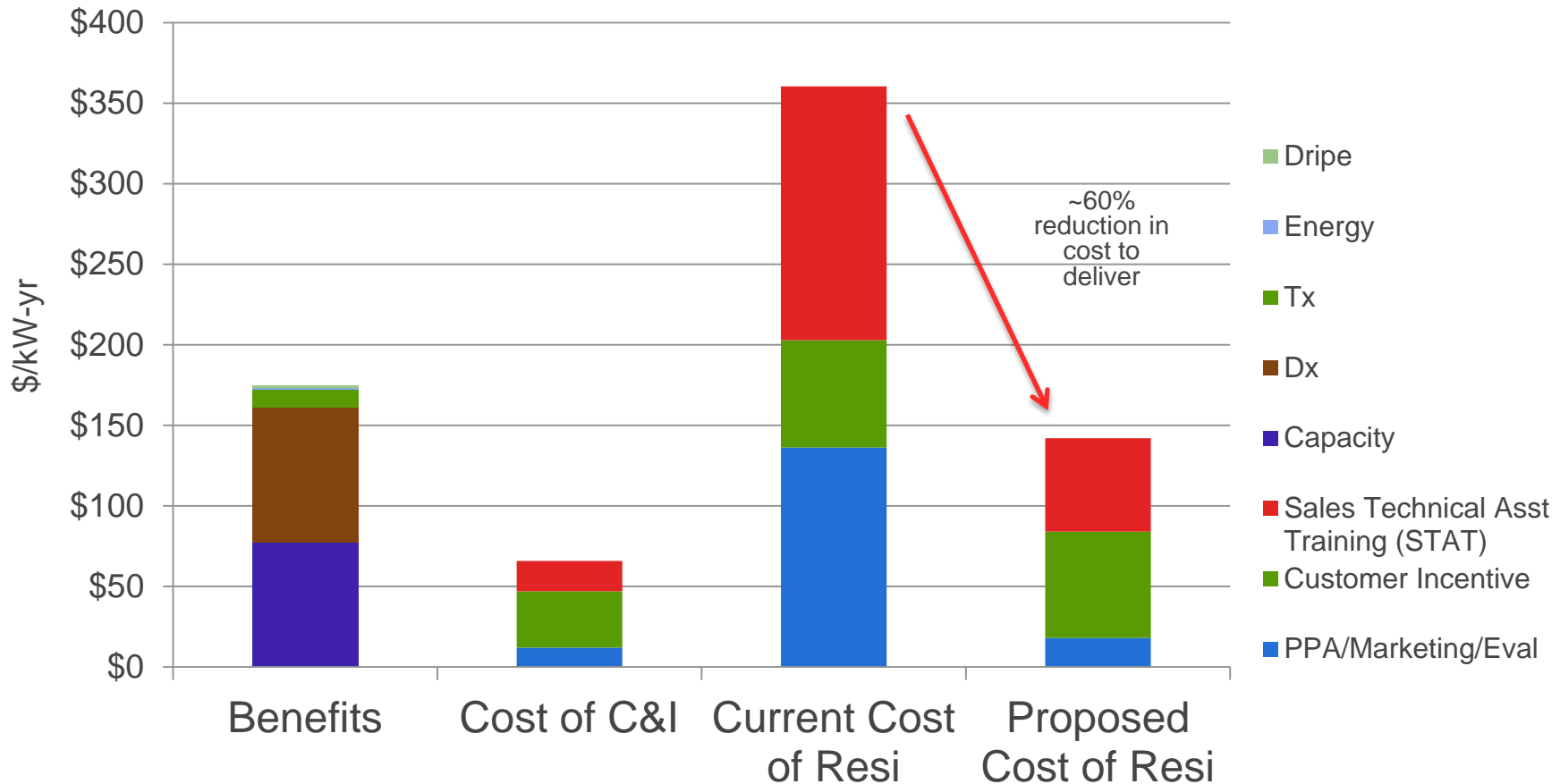
Non-participant

- Thermostat did not participate during the event because system was turned off prior to event notification, or in heating mode

No connectivity

- Thermostat data indicates there was no connectivity during the DR event. Thermostat may or may not have participated in the event

Cost Effectiveness of National Grid Demonstrations



Cost effectiveness of the Residential Demonstration is still a challenge. However, we are taking steps to reduce all possible costs to achieve cost effectiveness before the end of the demonstration.

Thank you

