

MA PAs

Demand Reduction Projects

Evaluation Plan Update

MA EEAC – PDR Sub Committee

February 23, 2017

Residential Evaluation Objectives



Evaluation Objective	Category	Example Question
Technology and Program Offering	Connectivity	Are there connectivity issues when relying on Wi-Fi for DR?
	Acceptance	Do customers join the program then drop-out or consistently opt-out?
	Customer Value	Do customers place value in the technology the DR program incentive?
Program Design and Implementation	Delivery	Does the success of the program delivery channel vary by sector?
	Marketing	How successful are various marketing efforts?
	Opt-out	How do opt-out rates vary by event and throughout the DR season?
	Coincidence w/ Peak	Did program call an event during the peak ISO-NE load hour?
DR Impacts	Demand & Energy	What are the demand and energy impacts of the DR project?
Scalability	Enrollment	Were programs able to achieve customer targets in 2017?
	Satisfaction	Are customers willing to participate year-over-year?
	Scalability	What elements of the program offering present a barrier to participation?

C&I Evaluation Objectives



- What are the demand and energy impacts of the demonstration project?
- What was the PA and customer satisfaction and experience with the offering?
- Were the events, software initiated changes, or installed technologies disruptive to participants and their business? Were there any effects on normal work activities?
- What value did the participants and PAs receive from the program?
- Are the solutions demonstrated ready for full scale rollout? Are technologies reliable? Were software controls able to predict the peak?
- What logistical problems arose with installing technologies?
- What type of customers participated? Why is that the case?
- How often can this customer base be called on to reduce load before becoming disgruntled? Is there a point of fatigue?
- What are the short and long term system level load reduction effects?
- What are the larger kWh effects for technologies and software?
- What is the load reduction that ISO NE would recognize?

Residential, Small C&I Evaluation Schedule



Demonstration Project	Apr 2017	May 2017	Jun 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018
National Grid Residential Thermostat			P	P	P, I	P	P		F		
National Grid Residential Wi-Fi Enabled			P		P	P	P		F		
National Grid SMB Thermostat			P		P, I		P		F		
Eversource Energy SMB Thermostat						P			F		
Cape Light Compact Residential				P	P		P		F		
Unitil Residential Battery							P, I				F

 2017 DR Season

- P – Interim Process Evaluation Reports (e.g., summaries of enrollment or post-event surveys, analysis of opt-out data)
- I – Interim Impact Evaluation Reports (e.g., partial season estimate of demand and energy savings)
- F – Final Report (incorporates process and impact evaluation elements)

C&I Evaluation Schedule



PA	Demonstration Project	2017												2018											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
CLC	Thermal Storage (Ice)																	t	p			d	f		
Eversource	Thermal Storage (Ice and Phase Change Material)																	t	p			d	f		
Unitil	C&I Software Based Demand Shifting Program				t			p				d		f					p						
Eversource	Software and Controls											t	p		d	f			p			d	f		
National Grid	C&I Connected Solutions*				t		p				d	f							p			d	f		
Eversource	Active DR for large C&I *											t	p	d	f				p			d	f		
Eversource	Battery Storage																	t	p			d	f		

*DR projects and perhaps other may require ongoing curtailment assessment

 DR project deployed
 Evaluation point

t Test run of data availability.
p Process

d Draft reporting
f Final reporting

- Funding decision and program deployment will drive the evaluation schedule.
- Schedule includes mid stream process evaluation activities.
- Schedule seeks to provide all evaluation work possible for the Fall 2017 EEAC meeting and then again for the April three year planning window.

Appendix



Residential, Small C&I Evaluation Approach



MA PA	Project	Process Evaluation Survey and Interview Fielding	Impact Evaluation Approach to Demand and Energy Impacts
National Grid	Residential Thermostat	<ul style="list-style-type: none"> • Enrollment Web Survey • Post-Event Opt-Out Web Survey • Post-Season Web Survey 	<ul style="list-style-type: none"> • A/B Experimental Design • Thermostat Telemetry • Leverage 2017 MA Baseline Study • Limited whole-home metering
National Grid	Residential Wi-Fi Enabled Devices	<ul style="list-style-type: none"> • Post-Season Interview 	<ul style="list-style-type: none"> • Within-Subject Baseline • Data Availability TBD • Leverage 2017 MA Baseline Study
National Grid	SMB Thermostat	<ul style="list-style-type: none"> • Enrollment Web Survey • Post-Event Opt-Out Web Survey • Post-Season Web Survey • Direct Install Vendor Interview 	<ul style="list-style-type: none"> • Within-Subject Baseline (Event/Non-Event) • Leverage 2017 MA Baseline Study • Limited Central AC Metering
Eversource Energy	SMB Thermostat	<ul style="list-style-type: none"> • Post-Season Web Survey • Direct Install Vendor Interview 	<ul style="list-style-type: none"> • Within-Subject Baseline (Event/Non-Event)
Cape Light Compact	Residential Thermostat and Wi-Fi Device	<ul style="list-style-type: none"> • Post-Event Web Survey • Post-Season Web Survey 	<ul style="list-style-type: none"> • Experimental Design or Within-Subject Baseline • Thermostat Telemetry • Leverage 2017 MA Baseline Study
Unitil	Residential Storage	<ul style="list-style-type: none"> • End of Summer Interview 	<ul style="list-style-type: none"> • Direct Metering of Solar PV, Storage and Whole-Home

Large C&I Evaluation Approach



PA	Initiative	Process Evaluation Survey and Interview Fielding	Impact Evaluation Approach to Demand and Energy Impacts
CLC	Thermal storage (ice)	<ul style="list-style-type: none"> End of Summer Interview 	<ul style="list-style-type: none"> Whole-Premise, technology interval metering Within-Subject regression, w or w/out pre-data Random on-off testing
Unitil	C&I software based demand shifting program	<ul style="list-style-type: none"> End of Summer Interview 	<ul style="list-style-type: none"> Whole-Premise interval metering Within-Subject regression with pre-data
National Grid	C&I Connected Solutions	<ul style="list-style-type: none"> End of Summer Interview 	<ul style="list-style-type: none"> Within-Subject Regression (Event/Non-Event) ISO-NE Baseline (Events and simulation)
Eversource	Battery storage	<ul style="list-style-type: none"> End of Summer Interview 	<ul style="list-style-type: none"> Whole-Premise, technology metering
	Thermal storage (ice and phase change material)	<ul style="list-style-type: none"> End of Summer Interview on sample 	<ul style="list-style-type: none"> Whole-Premise, technology interval metering Within-Subject regression, w or w/out pre-data Random on-off testing
	Software and controls	<ul style="list-style-type: none"> End of Summer Interview on sample 	<ul style="list-style-type: none"> Whole-Premise interval metering Within-Subject regression with pre-data
	Active DR for large C&I	<ul style="list-style-type: none"> End of Summer Interview on sample 	<ul style="list-style-type: none"> Within-Subject Regression (Event/Non-Event) ISO-NE Baseline (Events and simulation)

2017 Residential DR Projects



MA PA	Sector	2017 Customer Target and Technology	Program Delivery
National Grid	Res	5,000 - Thermostat (at least three vendors)	<ul style="list-style-type: none"> DR Platform: ConnectedSolutions and Rush Hour Rewards Recruitment: Bring-Your-Own-Thermostat and Home Energy Services
National Grid	Res	100 - Heat Pump WH 100 - Electric Resistance WH 15 - Dehumidifier 15 - Washer/Dryer	<ul style="list-style-type: none"> DR Platform: ConnectedSolutions Recruitment: Bring-Your-Own-Device (some direct marketing at point of purchase)
National Grid	SMB	1,000 - Thermostat (at least three vendors)	<ul style="list-style-type: none"> DR Platform: ConnectedSolutions and Rush Hour Rewards Recruitment: Bring-Your-Own-Thermostat and Direct Install program
Eversource Energy	SMB	300 - Thermostat (single model)	<ul style="list-style-type: none"> DR Platform: Vendor TBD Recruitment: Direct Install program
Cape Light Compact	Res	200 - Thermostat (single model) TBD - Mini-split	<ul style="list-style-type: none"> DR Platform: Vendor TBD Recruitment: Bring-Your-Own-Thermostat and Home Energy Services
Unitil	Res	6 - Battery Storage	<ul style="list-style-type: none"> Storage Controller: Vendor TBD Recruitment: Customers with existing solar photovoltaic system

2017 and 2018 C&I Projects



- Software and technology solutions can create load shifts with kWh impacts in addition to the kW reduction achieved.

PA	Initiative	Participants targeted	Evaluation Objectives	Likely timing
CLC	Thermal storage (ice)*	5-10 municipal buildings	kW and kWh	Summer 2017
Unitil	C&I software based demand shifting program †	Up to 2 identified by load profile fit, likely 1 manufacturer and 1 institutional	kW and kWh	Summer 2017
National Grid	C&I Connected Solutions ‡	Large C&I, must be able to shed 50 kW	kW	Summer 2017 and 2018
Eversource	Battery storage †	5-30 Large C&I	kW and kWh	Summer 2018
	Thermal storage (ice and phase change material)†	50-115 Large C&I	kW and kWh	Summer 2018
	Software and controls‡	80-400 Large C&I, municipal, university, hospital	kW and kWh	Summer 2017 and 2018
	Active DR for large C&I†	Large: 40-150	kW	Summer 2017 and 2018

* Initiative on hiatus pending Barnstable board funding change approval. Decision expected soon, but may take longer.

† Awaiting DPU approval to implement.

‡ Initiative is planned to include more than one vendor or control strategy.