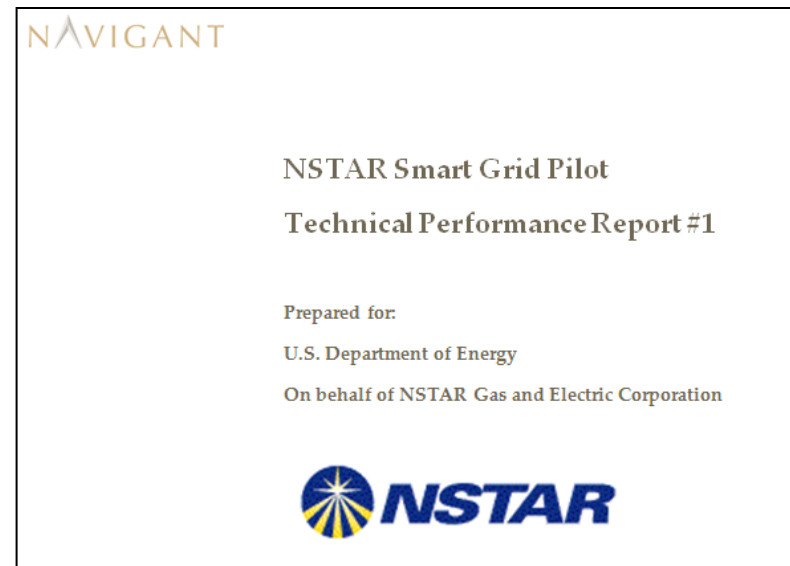


Introduction

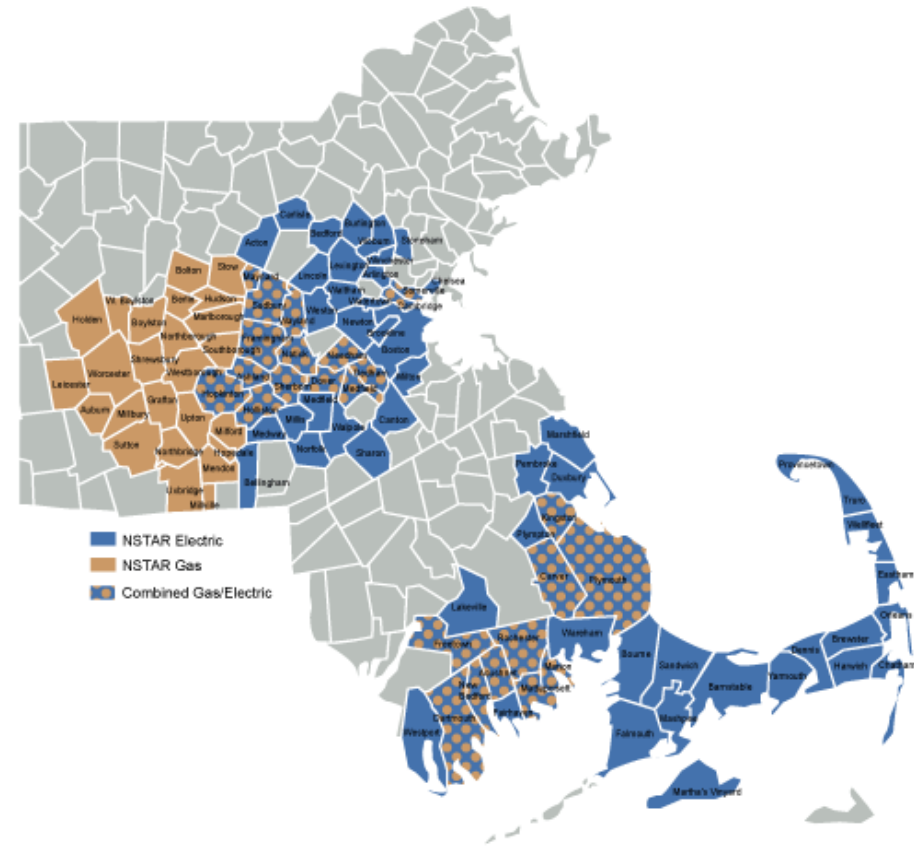
- » Comparison of results from load control technology and dynamic pricing
- » Interim analysis. Final analysis will be conducted in early 2014.
- » Interim evaluation report available at: <http://tinyurl.com/NSTAR-TPR1>
- » Results from 7 events in summer 2012

- » Results preview:
 - Customers with load control had load reductions of 19-26%
 - Customers with CPP had load reductions of 6%
 - No evidence of load reductions for customers with IHD only



Pilot Program Description

- » NSTAR Electric & Gas Company
- » Pilot began in 2010, with 24-month evaluation period starting January 2012
- » Opt-in program with 2,700 participants
- » Random assignment to four treatment groups with dynamic pricing and enabling technologies



Source: http://www.nstar.com/about_nstar/service_territory.asp

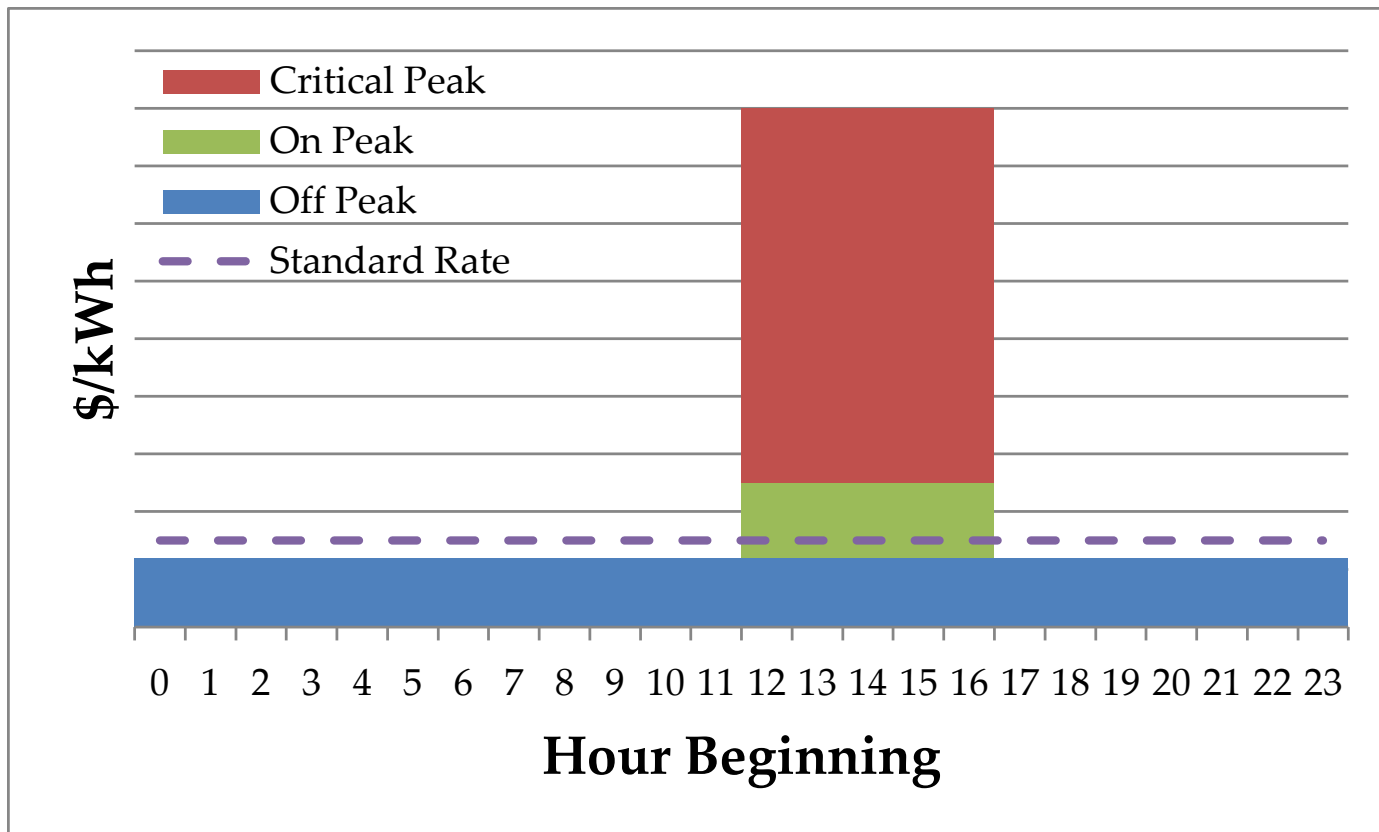
Treatment Types

<i>Group Name</i>	Enhanced Information	Peak Time Rebate	Critical Peak Pricing	CPP with Load Control
<i>Requirement</i>		Central AC		Central AC
<i>Technology</i>	In-home Display + Web Portal			
		Smart T-stat		Smart T-stat
<i>Base Rate</i>	Standard Rate		TOU	
<i>Event Rate</i>		\$5 rebate for event participation	CPP	CPP

Rate Descriptions

- Supply Charge:**
- » Off Peak = 0.6 x Standard
 - » On Peak = 2 x Standard
 - » Critical Peak = 10 x Standard

Peak Period:
Non-holiday
weekdays, 12-5pm



Technology Descriptions

- » **Internet gateway** to transmit consumption data from the meter to NSTAR and allow communication back to in-home energy displays
- » **In-home energy display** that shows real-time power demand, billing-period electricity consumption and cost, the current TOU electricity price or critical event status, and other related information
- » **Web portal**, a browser-based internet portal that enables monitoring, management, and control of energy consumption on enabled devices in the home
- » **Smart thermostat** allowing customers to program temperature set points either manually or via a user interface on the internet, and allowing NSTAR to send a signal that increases the temperature setting on thermostats by between 1 and 6 degrees

Methodology

- » Regression model
- » Hourly data
- » All pilot participants
- » Non-event days serve as baseline for event days
- » Controlled for hour of day, weather conditions (temperature humidity index, cooling degree hours, previous day's max THI), and morning load level
- » Event variables vary by hour of day, THI, and include binary snapback variables

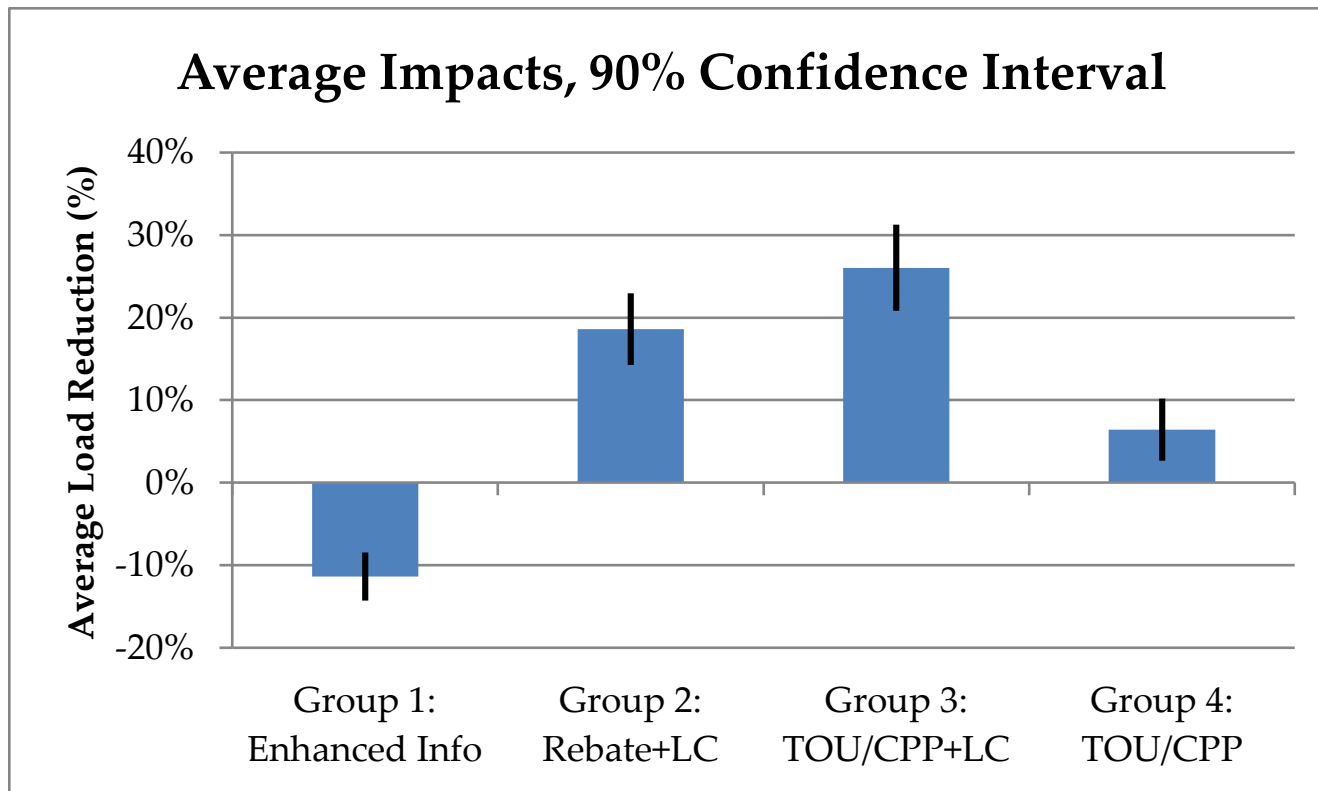
Summer 2012 Event Days

Event Date	Temperature (F)				
	12-1pm	1-2pm	2-3pm	3-4pm	4-5pm
21-Jun	90	90	91	92	93
22-Jun	90	92	93	92	93
17-Jul	92	92	92	94	94
18-Jul	85	85	82	77	75
3-Aug	-	-	91	92	92
8-Aug	82	83	82	83	85
31-Aug	-	-	87	88	88

Source: Navigant analysis of NOAA data.

Results: Average event impacts

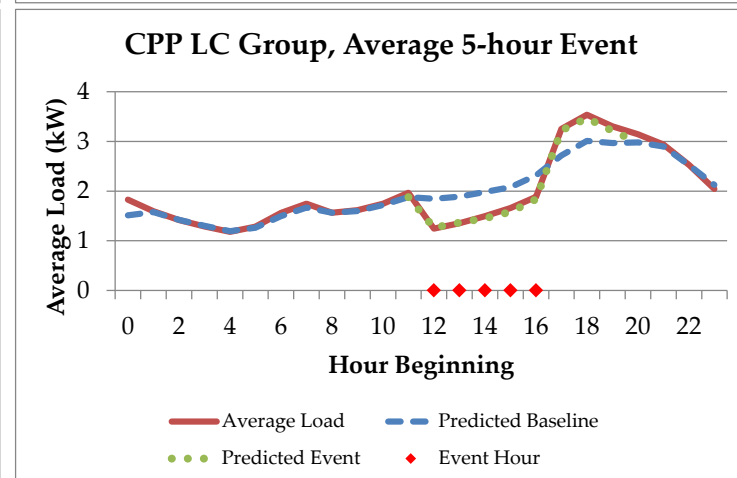
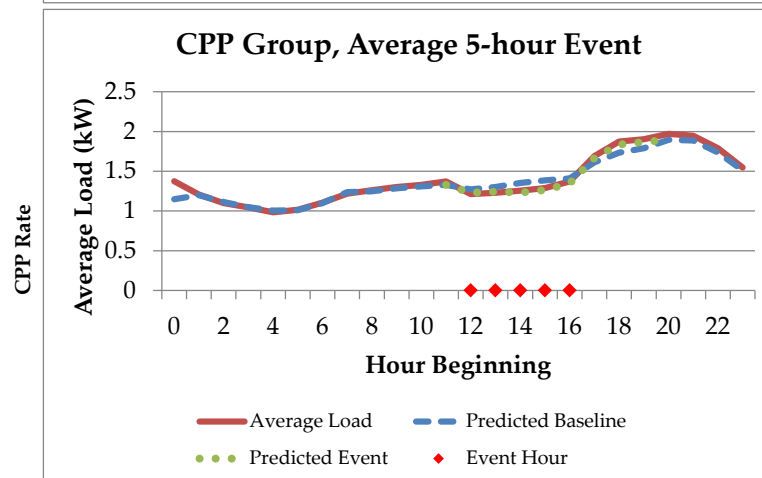
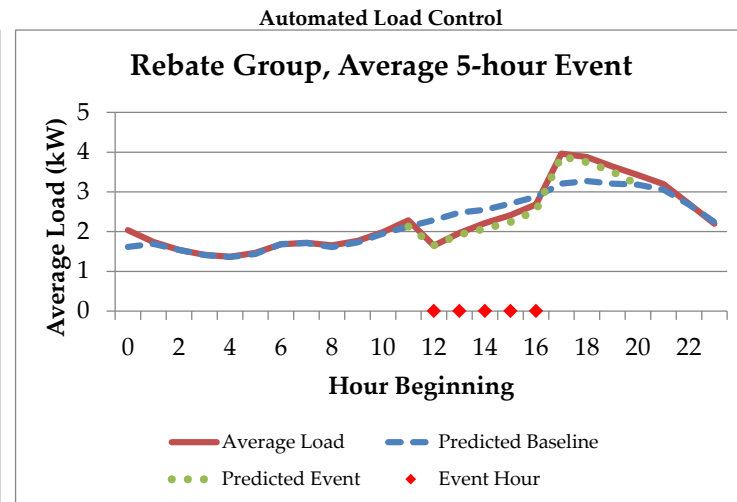
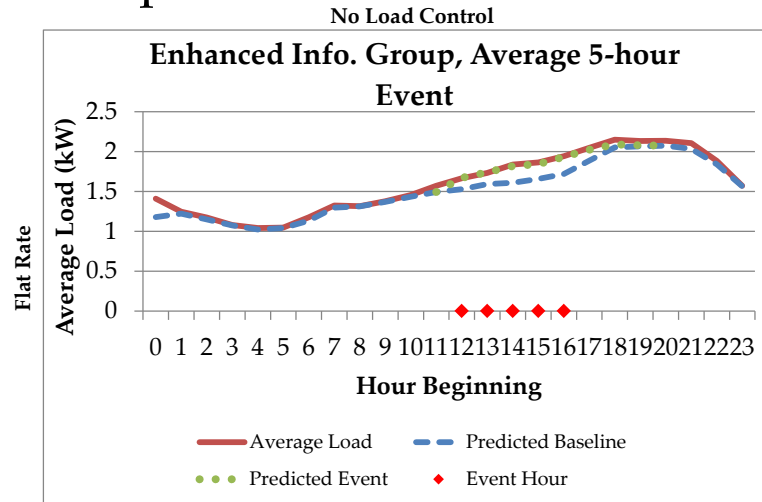
- » On average, customers with load control achieved demand reductions 4x greater (in % terms) than customers on the CPP rate only.



% reduction	-11%	19%	26%	6%
kW reduction	-0.18	0.48	0.52	0.08

Results: Average load curves during 5-hour events

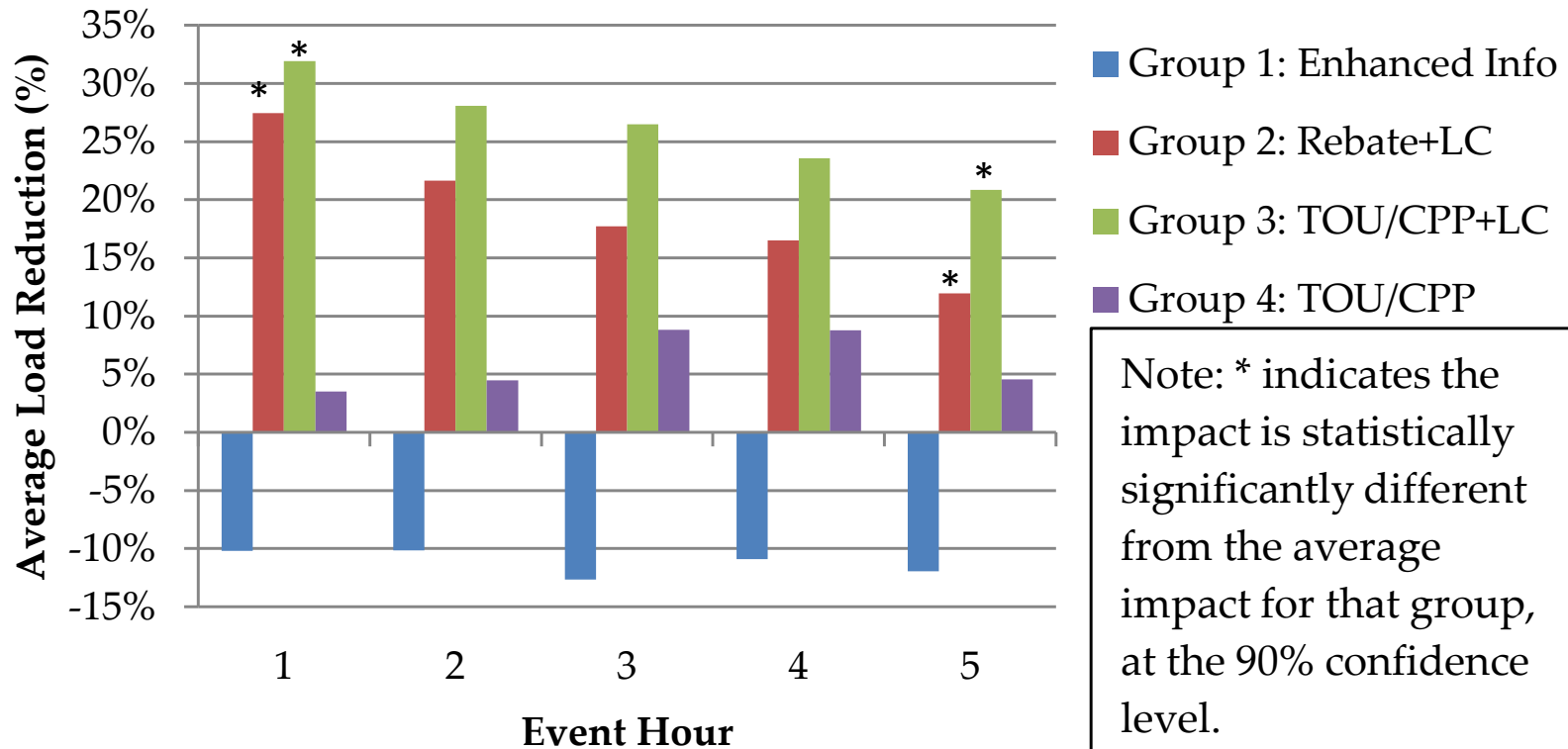
- » Load control technology results in large load reductions during events and snapback after the event.



Results: Load control impacts fade as the event progresses

- » As the event progresses more homes reach the thermostat set point and air conditioners begin to run.

Average Hourly Impacts, 5-hour Event



Results: By Subgroup

- » Low users and small homes had higher % savings
- » High users had approximately double the kW savings
- » Participants with an elderly present had higher savings (% and kW)

Group	All Participants		High Income		Low Users		High Users	
	%	kW	%	kW	%	kW	%	kW
Rebate + LC	19%	0.48	18%	0.48	37%	0.32	19%	0.9
TOU + CPP with LC	26%	0.52	29%	0.6	43%	0.22	32%	1.2
TOU + CPP	6%	0.08	5%	0.08	-	-	12%	0.37

Group	Elderly Present		Small Homes		Large Homes	
	%	kW	%	kW	%	kW
Rebate + LC	30%	0.54	43%	0.51	18%	0.58
TOU + CPP with LC	33%	0.61	44%	0.5	34%	0.89
TOU + CPP	-	-	-	-	14%	0.3

Take-Aways

- » Load control technology generated larger demand reductions than dynamic pricing
- » Load control demand reductions faded as event progressed (given pilot technology)
- » Demand reductions for CPP and PTR generated similar demand reductions when paired with load control
- » No evidence of demand reductions with information only



Key CONTACTS



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Interim evaluation report available at:
<http://tinyurl.com/NSTAR-TPR1>

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