

Cape Light Compact

Demand Response Demonstration Offering

MA EEAC – PDR Sub Committee
February 23, 2017

Planned Offering Overview

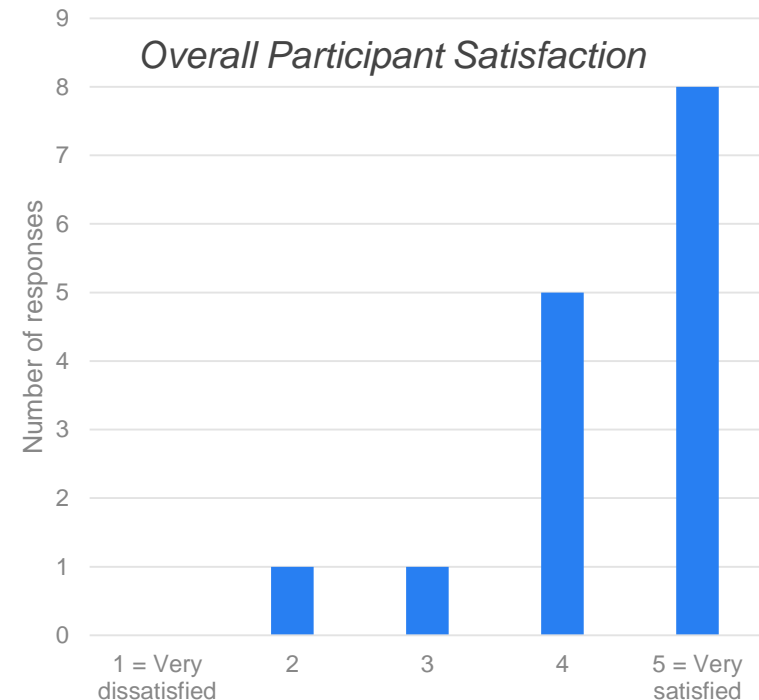


- CLC included a DR Demonstration Offering in 2016-2018 Plan
 - Offered participants a WiFi thermostat and energy monitoring equipment, monitored/controlled via app and/or web
 - Participants must have central a/c controlled by wall-mounted thermostat
 - Participants' thermostat set points were adjusted 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

2016 Preliminary Results



- Offering goal: Learn how to best engage residential customers in demand response, use experience to inform further DR program development in the areas of:
 - Overall satisfaction
 - Enrollment motivators
 - Customer acceptance
 - Technology
 - Effect on comfort
 - Event participation
 - Fatigue within events
 - Opt-in vs. opt-out approach

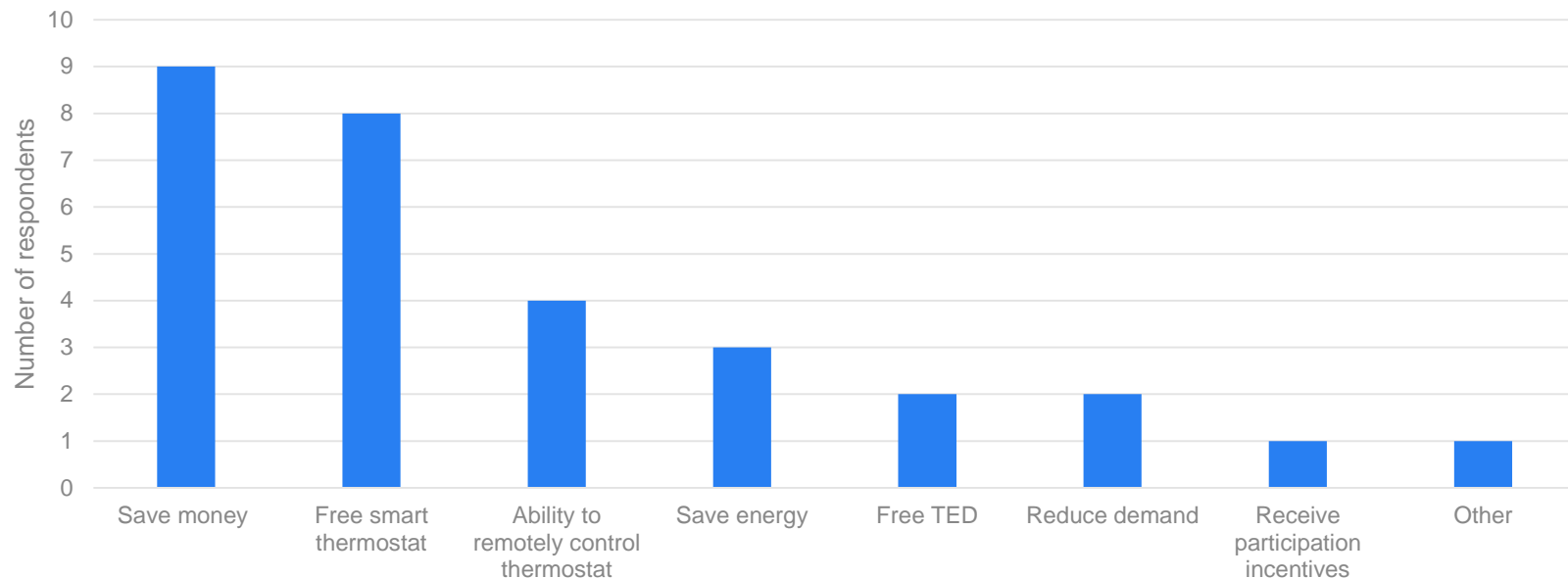


2016 Preliminary Results



- Most cited participation motivators were to save money, receive free thermostat, and ability to remotely control thermostat
- Participation incentives were not significant motivators

Reasons for Participant Enrollment

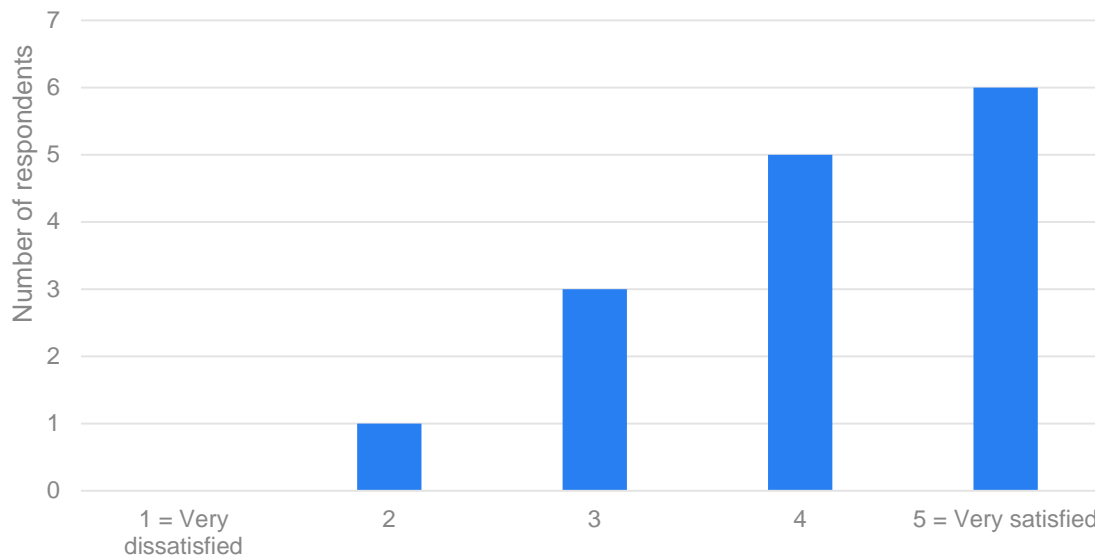


2016 Preliminary Results

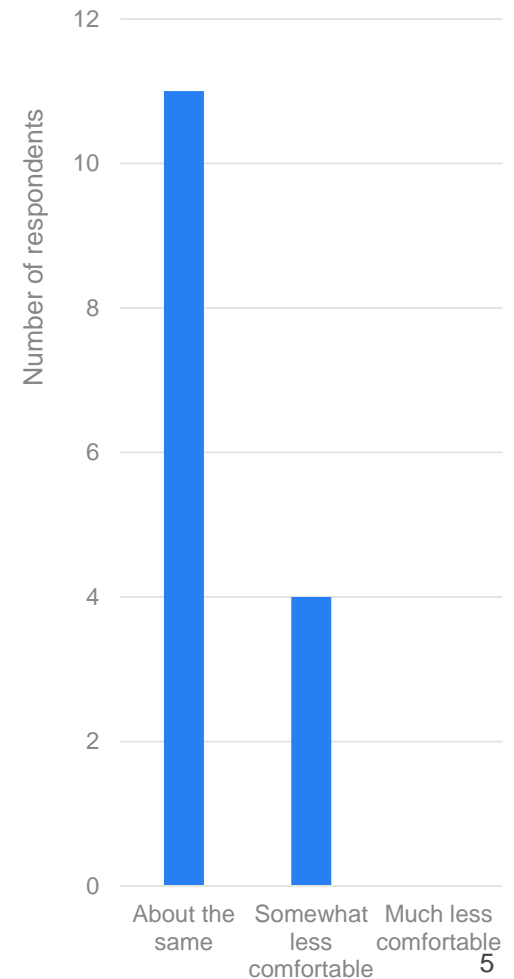


- Most customers were satisfied with the performance of their thermostat
- Most customers did not report a decrease in comfort (vs. days of similar temperature)
- Customers were active users of technology & information

Thermostat Performance Satisfaction



General Comfort During Events

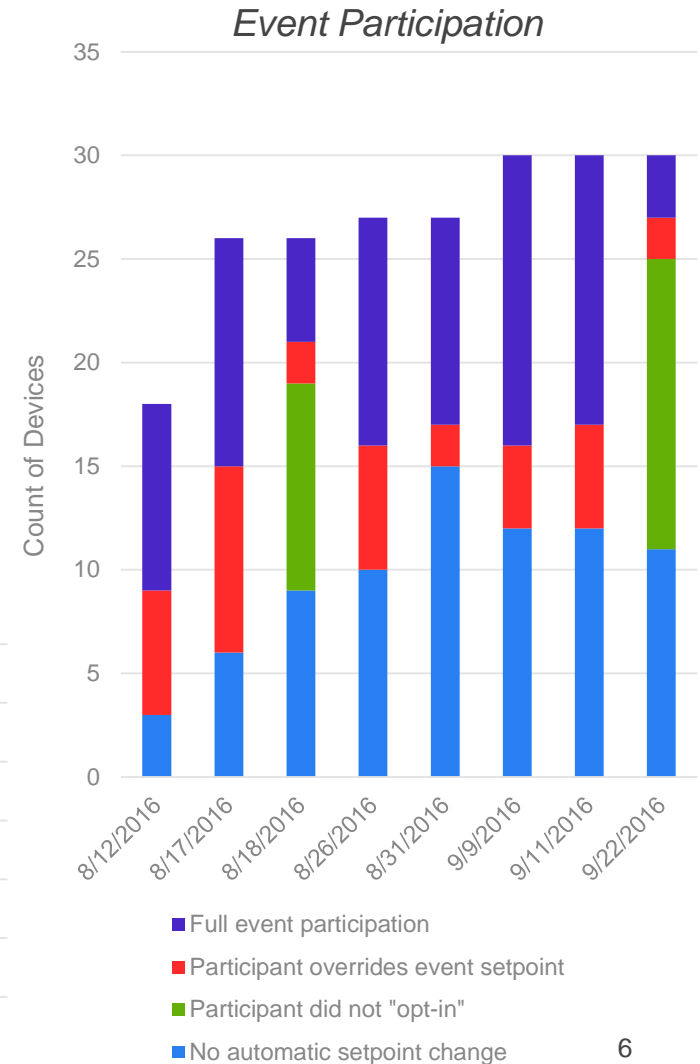
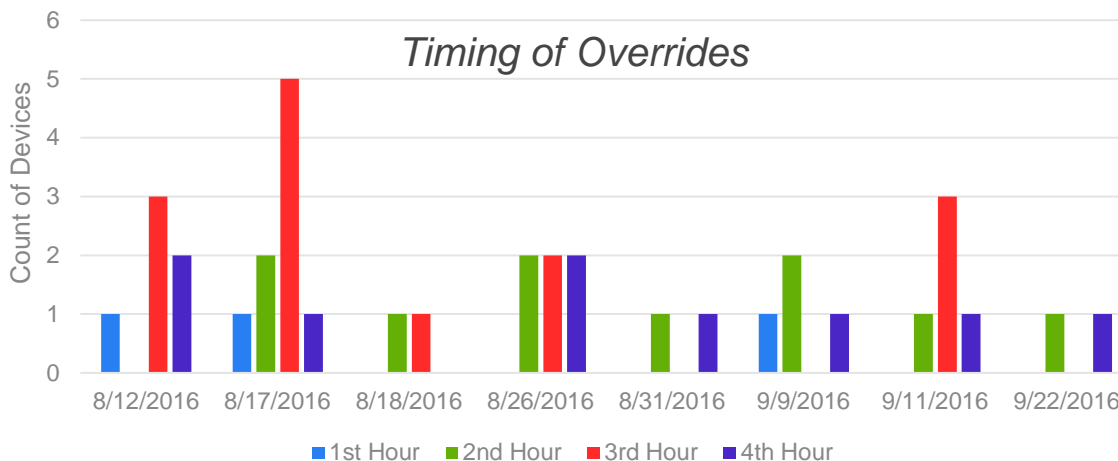


2016 Preliminary Results



Results are not statistically significant

- 22 participants in 8 events
 - Currently 39 participants enrolled, 56 devices
- Most participants that did not receive set point change had A/Cs off
- Opt-out rate averaged 32%
 - 4 “serial opt-outers” accounted for 60% of opt-outs
 - Most overrides occurred in 3rd hour



2016 Takeaways & 2017 Adjustments



- High customer satisfaction
 - Most reported they would continue to participate in future summers
- Technology concept was well-received, but some customer issues with thermostat use and installation
 - 2017: Switch to Honeywell Lyric thermostat, either previously installed or installed through Direct Install initiative
- Opt-out design is most effective
 - 2017: All events will be called as opt-out
- Event fatigue occurred the most in hour 3
 - 2017: May call shorter events

2016 Takeaways & 2017 Adjustments (cont.)



- Curtailment degradation after event hour 2
 - 2017: For 4-hour events, stagger thermostat setbacks over event
- Some pre-cooling and snapback occurred
 - 2017: May stagger event times across participants
- Limited pool of participants
 - 2017: Incorporate mini-splits in to DR platform
- No smart metering
 - Deployment of work-around meter readers expensive & slow
 - 2017: no real-time metering

- As part of MTM, proposing behind-the-meter thermal storage demonstration projects for small-medium C&I customers
 - Ice Bear technology targets summer peak loads from air conditioning
 - Works in concert with air conditioning equipment to reduce demand at set hours without impacting indoor temperature
 - Plan to deploy 5 – 10 units before summer 2018
 - Locations being selected to demonstrate potential to deliver customer- and grid-facing benefits, in areas with high seasonal population fluctuation

Mid-Term Modification



- Compact proposes MTM to:
 - Decrease spending on Res. Behavior Feedback Core Initiative
 - Fund C&I thermal storage offering as part of DR Demonstration Offering
- Will present MTM and proposed resolution at 3/1 ExCom meeting and 3/15 EEAC meeting for vote
- Net increase of \$757,642 over approved Plan

<u>Budget</u>	<u>2016-2018 Plan</u>		<u>Proposed in MTM</u>		<u>MTM minus Plan</u>
	<u>2017</u>	<u>2018</u>	<u>2017</u>	<u>2018</u>	
Res. Behavior Feedback Initiative	\$326,115	\$329,832	\$153,448	\$147,635	-\$354,864
Demand Response Offering (total)	\$267,797	\$349,697	\$890,000	\$840,000	\$1,112,506
<i>DR C&I</i>	\$26,780	\$34,970	\$485,000	\$485,000	\$908,250
<i>DR Residential</i>	\$241,017	\$314,727	\$405,000	\$355,000	\$204,256
<u>Grand Total</u>	<u>\$593,912</u>	<u>\$679,529</u>	<u>\$1,043,448</u>	<u>\$987,635</u>	<u>\$757,642</u>

Thank you

Appendix: 2016 Preliminary Results – Impact Analysis



Results Not Statistically Significant

- kW savings achieved
- Similar temp days used as baseline, then adjusted for pre-event usage on day of event
- Significant limitations:
 - Very small sample size
 - Based on whole-home energy consumption
 - Humidity not accounted for in baseline adjustment
 - Pre-cooling and early shutoff would skew baseline and estimated savings

Indicative Load Curtailment Per Participant Using Non-Event Baseline (w/ Day-of Adjustment)	All Participants (kW)	Event Set Point Change Only (kW)
Across All Events	-0.4	-0.6
High Temperature Days (87-89 F)	-0.5	-0.5
Medium Temperature Days (85-86 F)	-0.7	-0.8
Low Temperature Days (79-81 F)*	-0.1	-0.3

