

# CUTTING PEAK DEMAND: TWO COMPETING PATHS AND THEIR EFFECTIVENESS

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STEVEN TOBIAS  
2017 IEPEC CONFERENCE  
BALTIMORE, MARYLAND



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**NAVIGANT**

# NATIONAL GRID'S CONNECTED VISION

## Why



60% of customers are interested in connected home solutions



Convenience



Control



Savings

## What



Integrated platform for connected devices



Future



## How



Partnerships



BYOD



Integration with EE and Smart Grid

# 2016 PROGRAM DESIGN

National Grid's Residential Wi-Fi Thermostat DR program includes two program offerings: Rush Hour Rewards (RHR) and ConnectedSolutions (CS)



Nest



Ecobee



Honeywell

## Rush Hour Rewards

Program Duration: 52 hours  
Event Duration: 4 hours  
Pre-Cooling: Yes  
Setback: +/- 3°  
Incentive: Annual

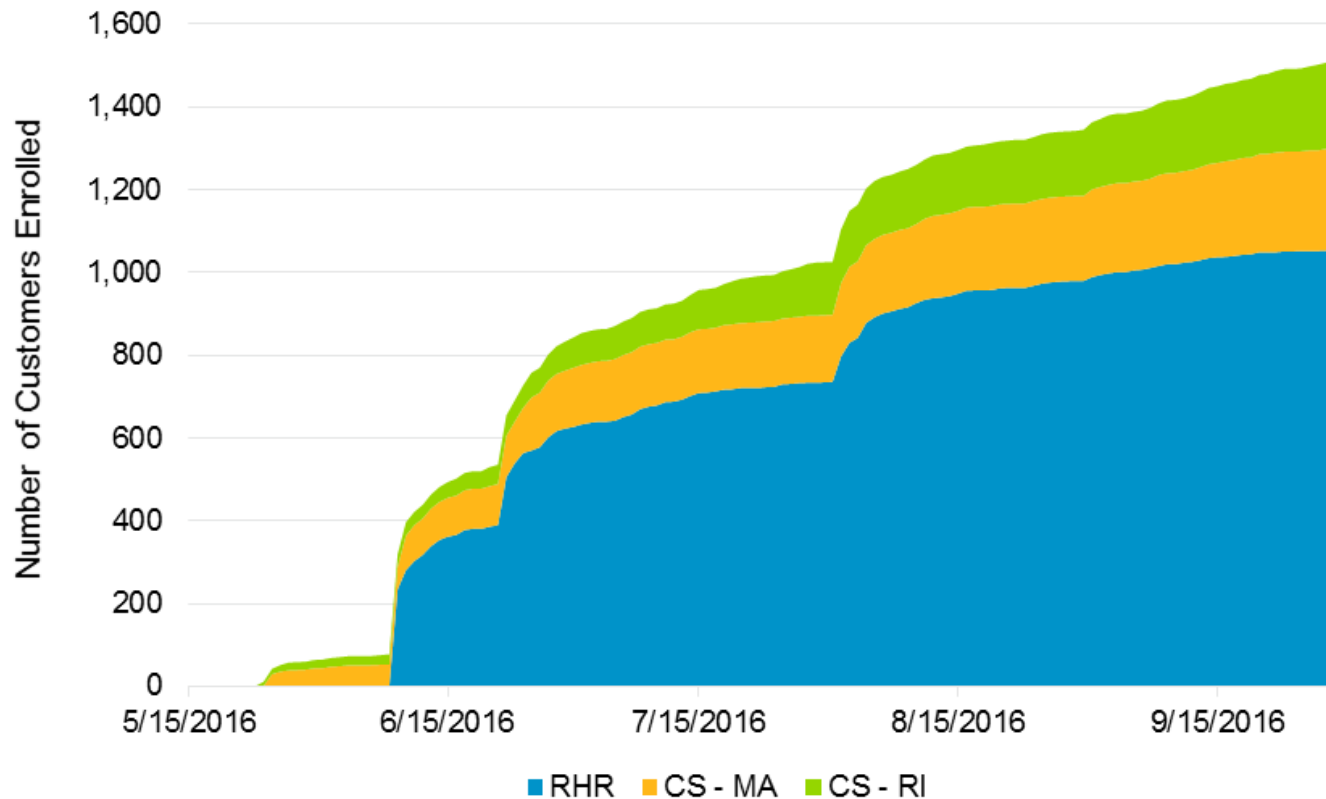
## ConnectedSolutions

Program Duration: 108 hours  
Event Duration: 2-4 hours  
Pre-Cooling: No  
Setback: +2°  
Incentive: Annual + Participation

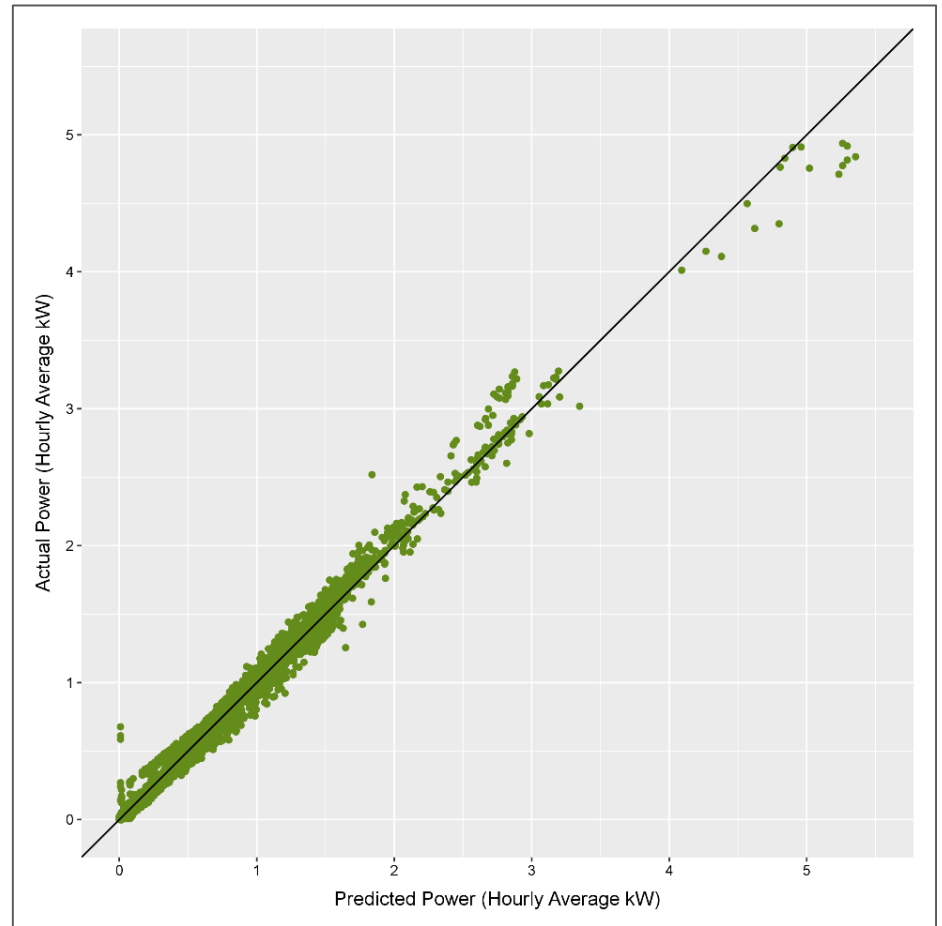
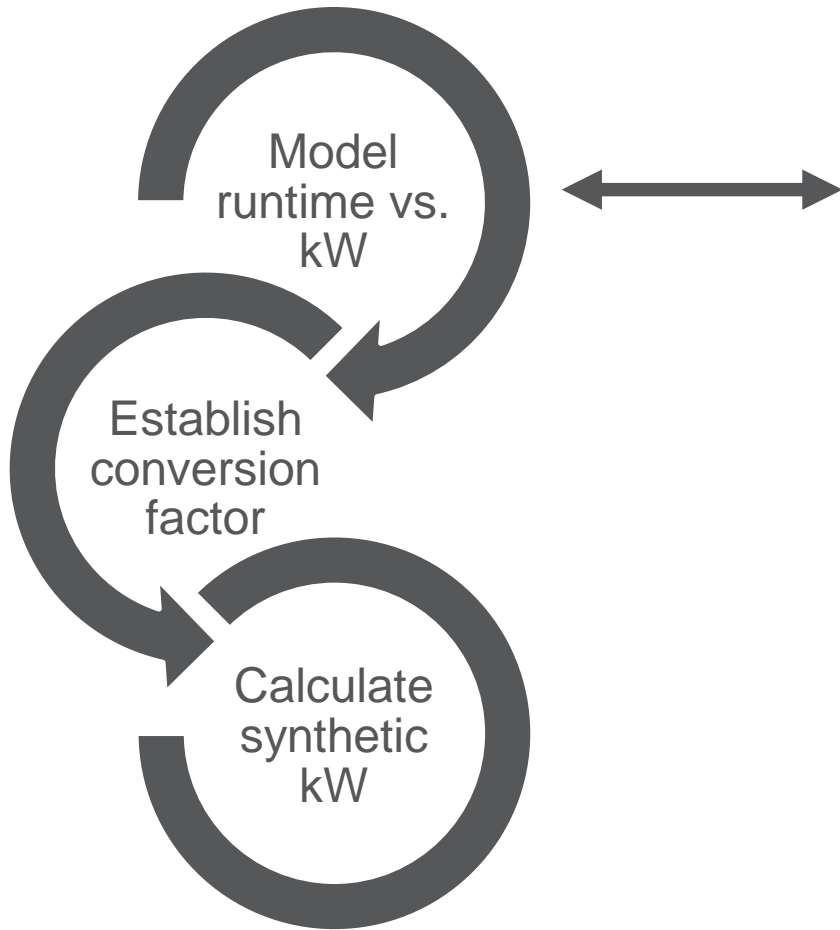
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# ENROLLMENT

Program enrollment began in May 2016 and continued throughout the DR season



# NO AMI DATA – SYNTHETIC KW



# RESEARCH QUESTIONS

## Demand Reduction

- What is the 2016 DR season demand savings?

## Opt Outs

- How often do customers opt out?
- How do opt outs affect savings?

## Device vs. Customer

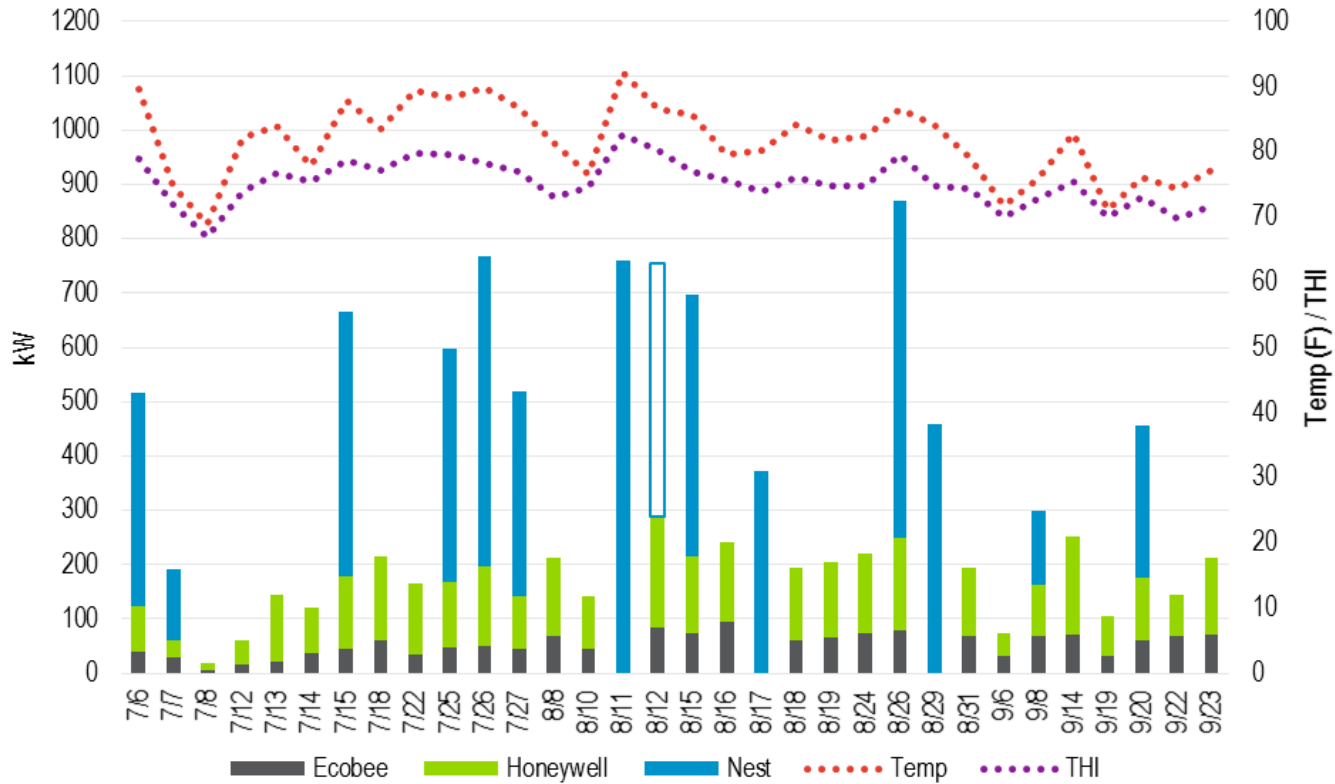
- What are the savings per device?
- What are the savings per customer?

## Weather

- How does weather impact savings?

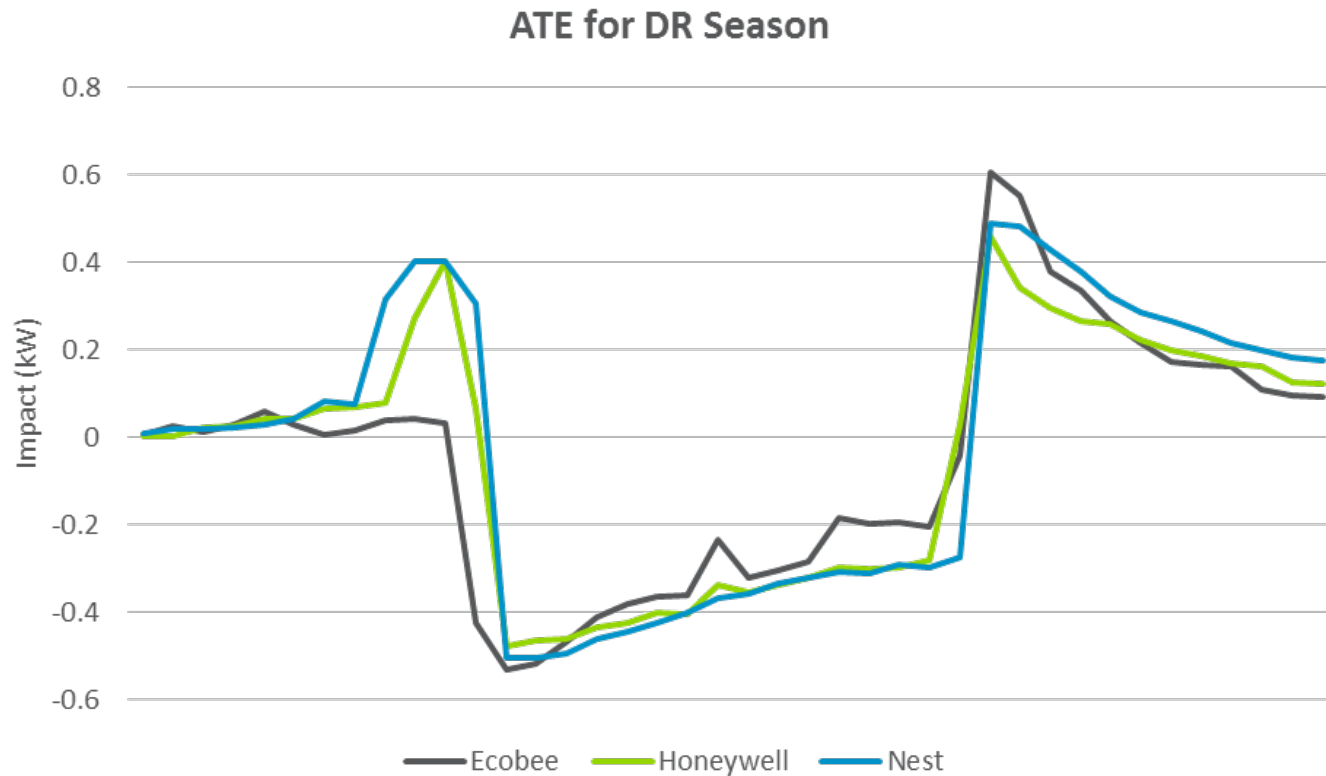
# DR SEASON RESULTS

2016 DR Season results for Massachusetts and Rhode Island. Total savings varied due to rolling enrollment, weather, and differing event schedules.



# DR SEASON DEVICE LEVEL RESULTS

Results at the 15 minute level show the effect of pre-cooling.

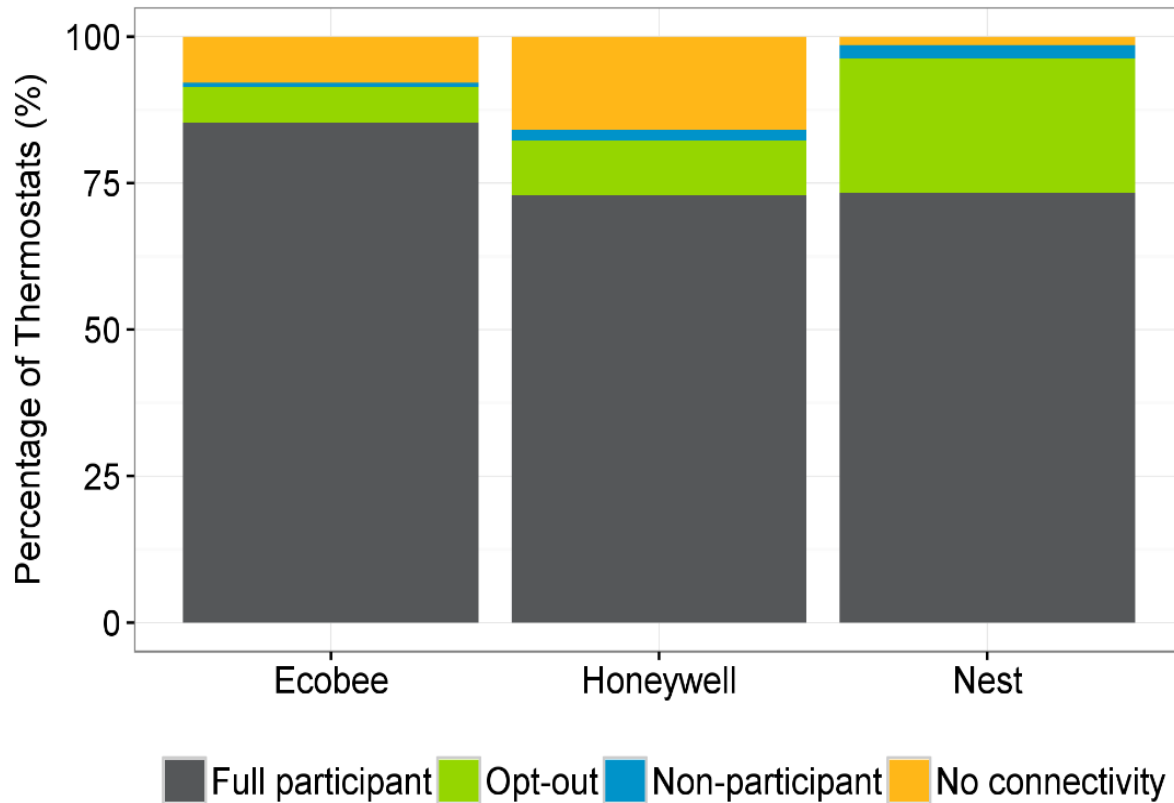


ATE: Average Treatment Effect



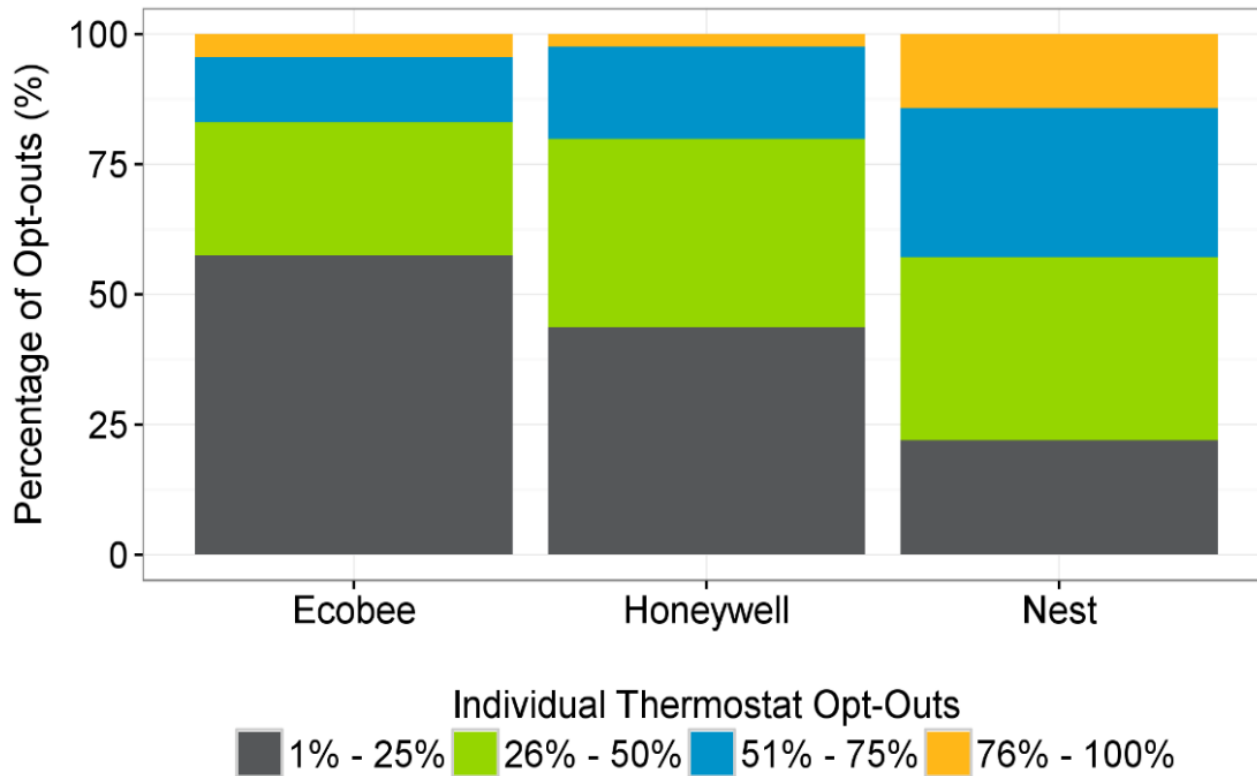
# OPT OUTS

The opt out rate and overall connectivity varied by device type.



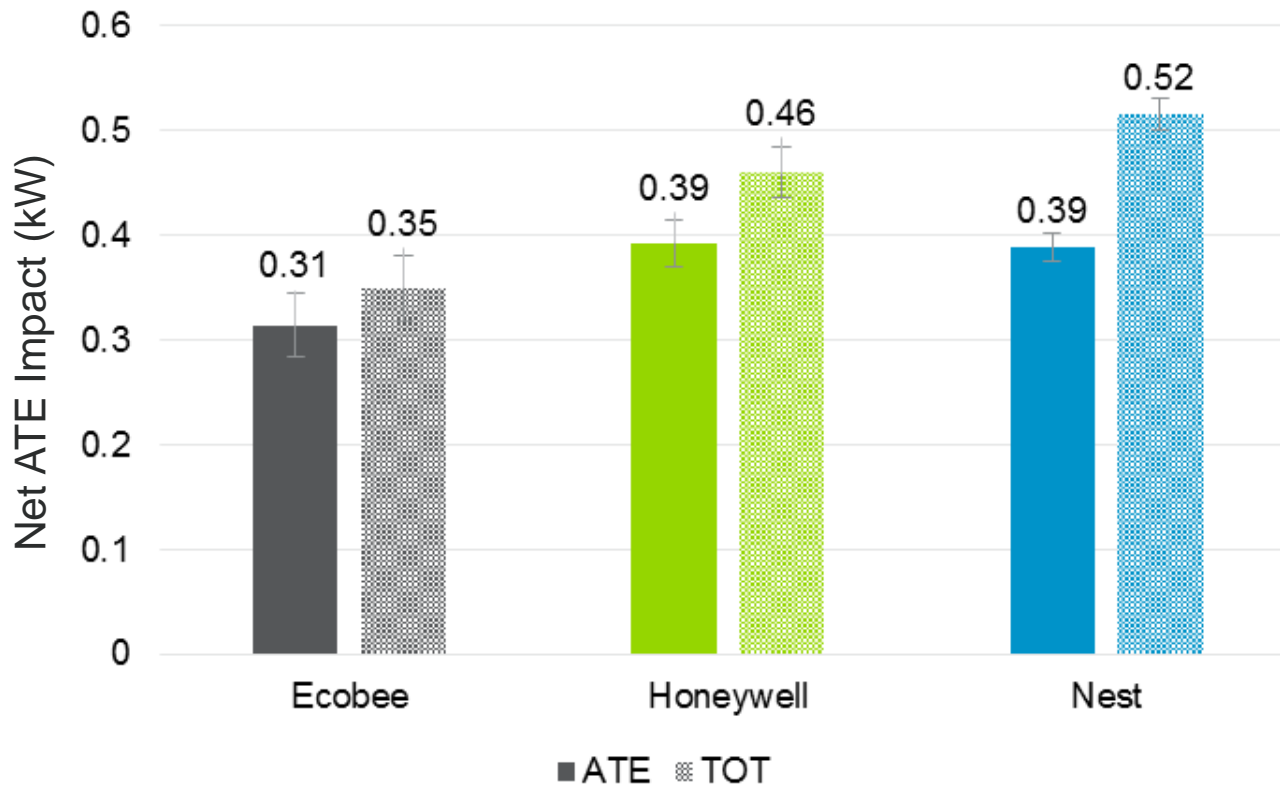
# OPT OUTS

The rate of repeat opt-outs by device was highest for Nest thermostats.



# OPT OUTS – ATE VS. TOT

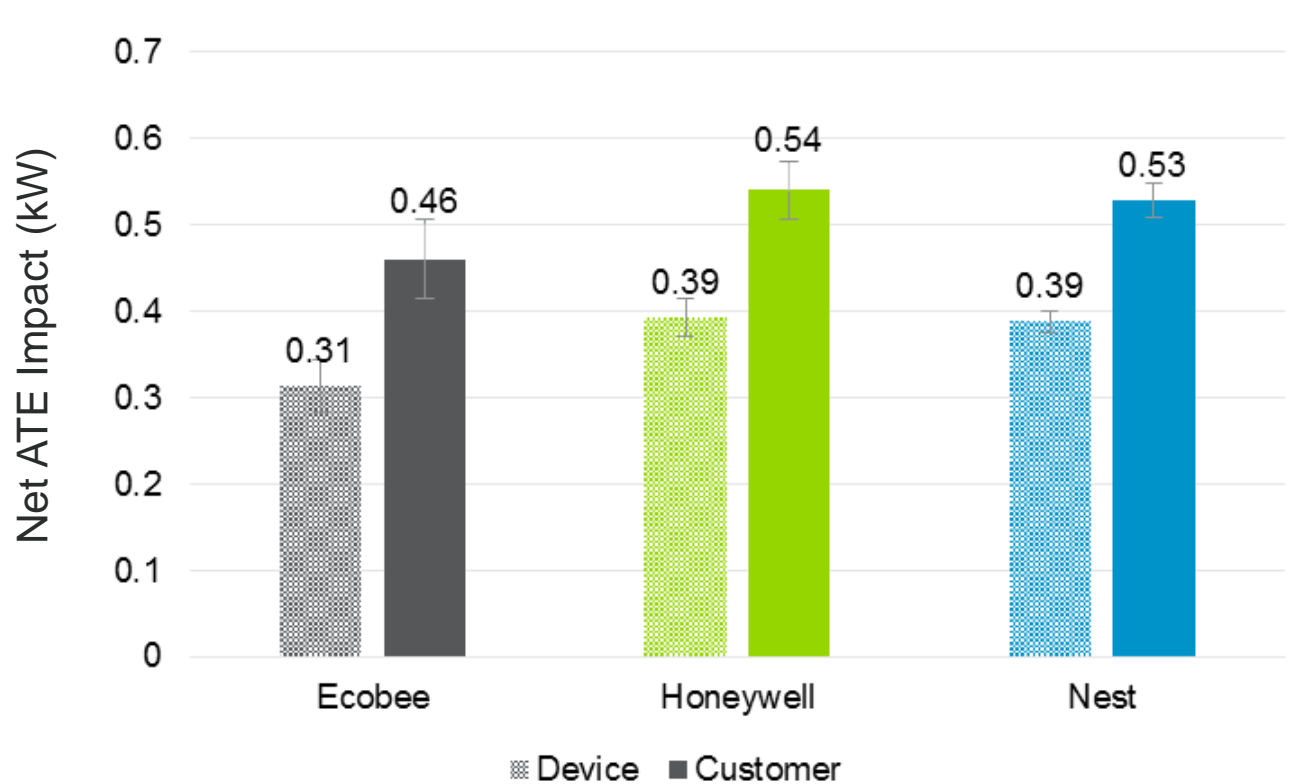
Opt outs and connectivity issues reduced the average event impact.



ATE: Average Treatment Effect; TOT: Treatment on the Treated

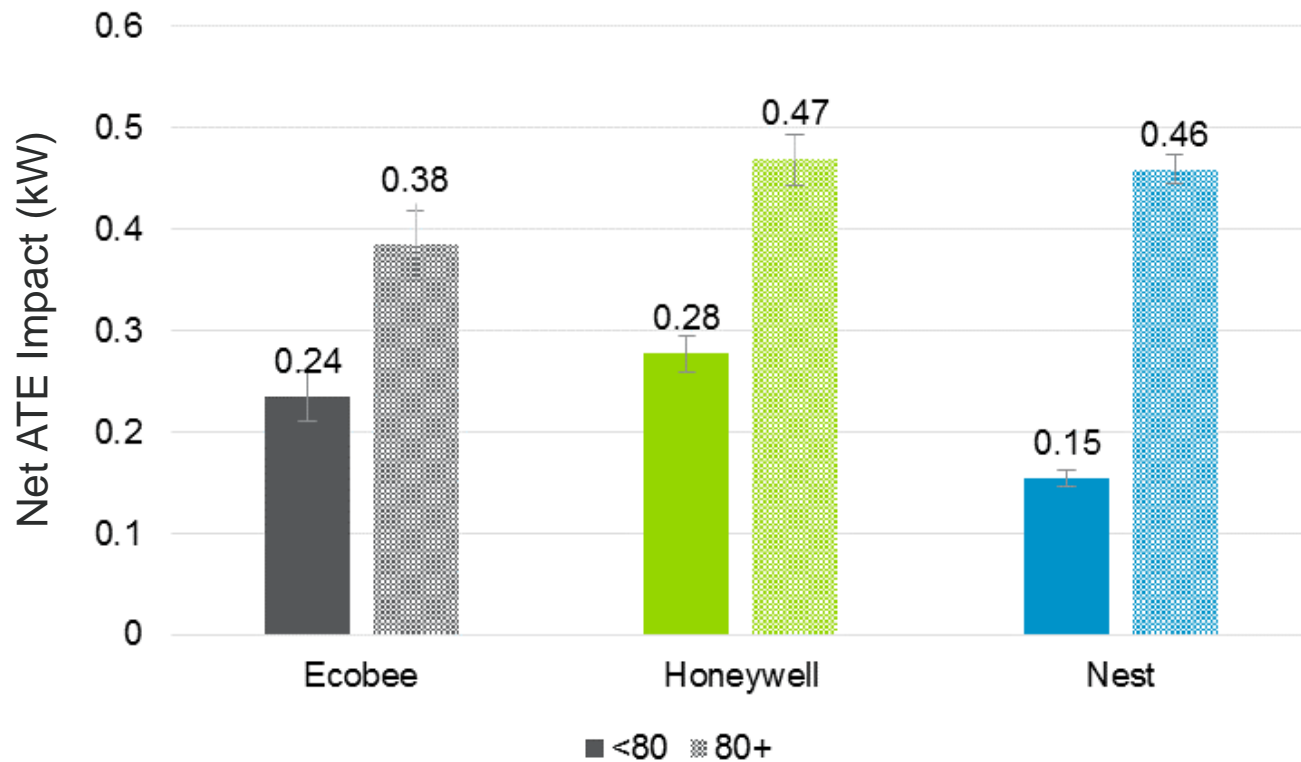
# DEVICE VS CUSTOMER

With an average of 1.4 thermostats per customer, customer-level impacts exceeded device-level impacts



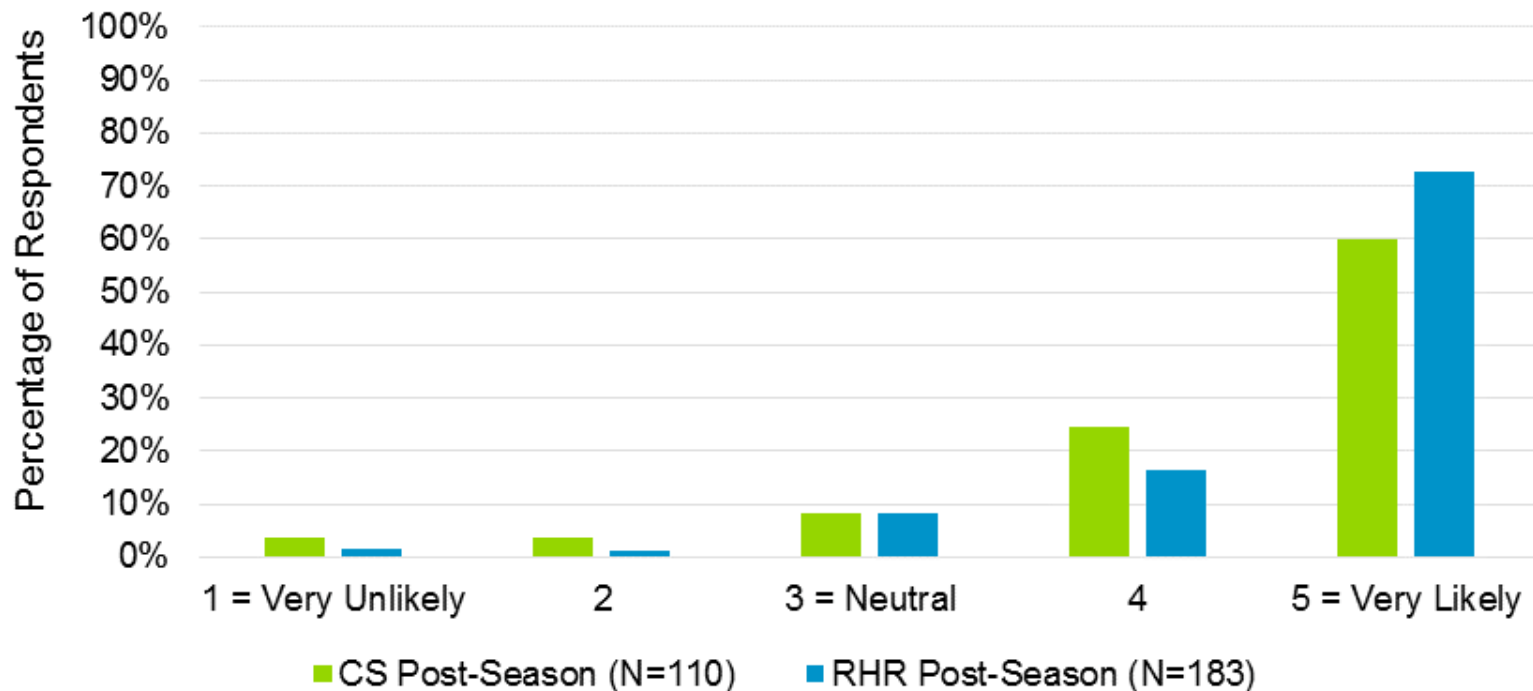
# WEATHER

Due to the pricing based event criteria, a few events were called on sub-80 degree days, reducing average impacts.



# PROGRAM SATISFACTION

Based on the 2016 DR season experience, >85% of customers will continue to participate in the program.



# CONCLUSIONS

## 2016 Demand Savings

- Max impact of 869 kW

## Opt Outs

- Opt outs reduced average event savings
- Nest had highest rate of opt outs and repeat “opt-outers”

## Device vs. Customer

- Customer impacts were larger than device impacts
- Can not estimate true customer impact without AMI data

## Weather

- Events called on sub 80 degree days reduced average savings
- Average impacts are higher on warmer event days

# CONTACTS

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