

# Getting Smarter? Evidence of Savings from the Nest Thermostat

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DISPUTES & INVESTIGATIONS • ECONOMICS • FINANCIAL ADVISORY • MANAGEMENT CONSULTING



# Overview



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Hurdles encountered along the way

# Research Objectives



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## 1. Estimate Savings

- Gas (SoCalGas) and electric (Southern California Edison, Los Angeles Department and Water and Power, and Water and Power, City of Pasadena)
- 2014/2015 winter, 2014 summer
- Percent of total usage, percent of heating/cooling load, typical meteorological year

## 2. Customer Response

- Survey of participating and non-participating customers
- Willingness-to-pay for a smart thermostat

## 3. General Application of Findings

- Comparison of thermostat data across pilot population, general population

# Pilot Implementation



# Pilot Implementation

All Households



Screened Out

- AMI
- Geographic targeting: Inland Empire, Palm Springs, Central LA, and the San Fernando Valley
- Excluded top and bottom 10%

Screened In

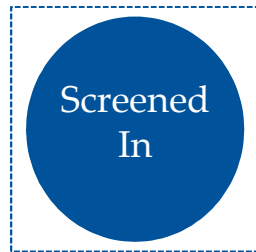
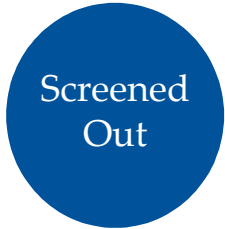


Target Population

# Pilot Implementation

All Households

Target Population



**Get a \$249 Nest Learning Thermostat\* for Free!**

Greg Ekren  
1375 Walnut St  
Suite #200  
Boulder, CO 80302

Southern California Gas Company (SoCalGas) is piloting a first of its kind thermostat that programs itself to help you manage your energy costs and save on your energy bill. Your household has been selected as a potential recipient of a free Nest Thermostat (a \$249 value) with free installation.

The Nest Thermostat learns your schedule, turns itself down when you're away and can be controlled from your smartphone, tablet, or laptop. You can learn more about the Nest Thermostat at [nest.com](http://nest.com).

SoCalGas is recruiting customers like you to participate in this study and help us understand how consumers are using this new kind of thermostat.

To see if you're eligible to receive a free Nest Thermostat, go to <http://SoCalGasNESTPilot.surveyanalytics.com> by December 15th, 2013 and take a quick survey. Please have your SoCalGas account number and your electric utility account ready.

You will need your Unique Key

The website <http://SoCalGasNESTPilot.surveyanalytics.com> has a Frequently Asked Questions section on things like eligibility requirements, scheduling installation, and the purpose of the study. If you qualify, you will be contacted to set up installation. If you do not qualify, you may be eligible to receive \$75 in free gift cards by agreeing to participate in another part of our study.

We look forward to hearing back from you on this exciting opportunity!

Regards,  
SoCalGas Nest Thermostat Study Team

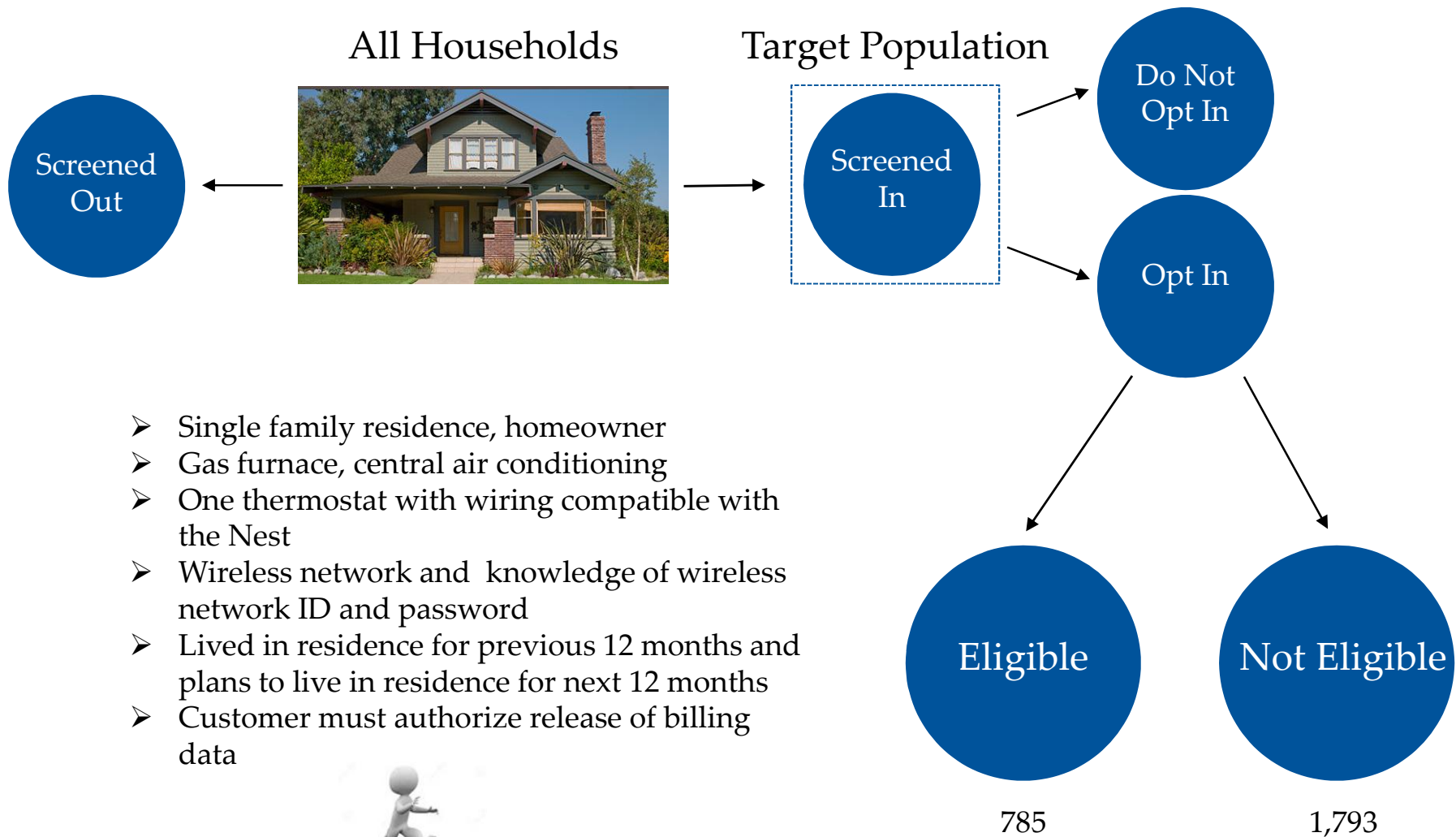
Southern California Gas Company makes no representations, warranties or guarantees in connection with the Nest Learning Thermostat Pilot Program. Participation in the Program is subject to the terms and conditions of the program. Southern California Gas Company reserves the right to limit participation by any Customer, and to disallow or terminate, in its sole discretion, at any time after admission, participation by any Customer in the Program. Any participation is subject to the terms and conditions of the program. Participation by any Customer in the Program is subject to the terms and conditions of the program. Participation by any Customer in the Program is subject to the terms and conditions of the program. Southern California Gas Company values your privacy. For more information, view our Privacy Policy and Privacy Notice.

- Direct mail and two email campaigns
- December 2013 through July 2014
- Free Nest thermostat with installation





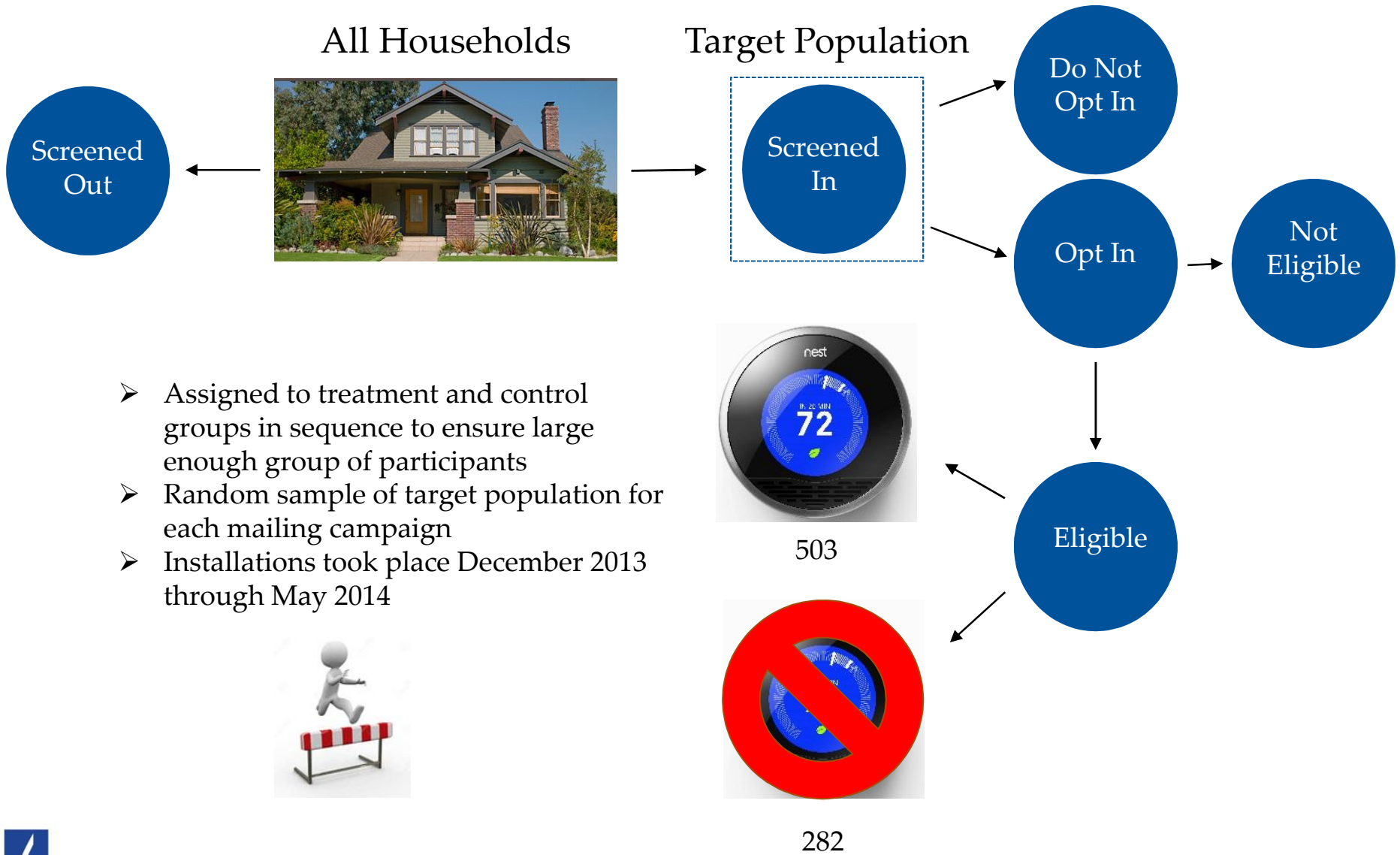
# Pilot Implementation



- Single family residence, homeowner
- Gas furnace, central air conditioning
- One thermostat with wiring compatible with the Nest
- Wireless network and knowledge of wireless network ID and password
- Lived in residence for previous 12 months and plans to live in residence for next 12 months
- Customer must authorize release of billing data



# Pilot Implementation



- Assigned to treatment and control groups in sequence to ensure large enough group of participants
- Random sample of target population for each mailing campaign
- Installations took place December 2013 through May 2014

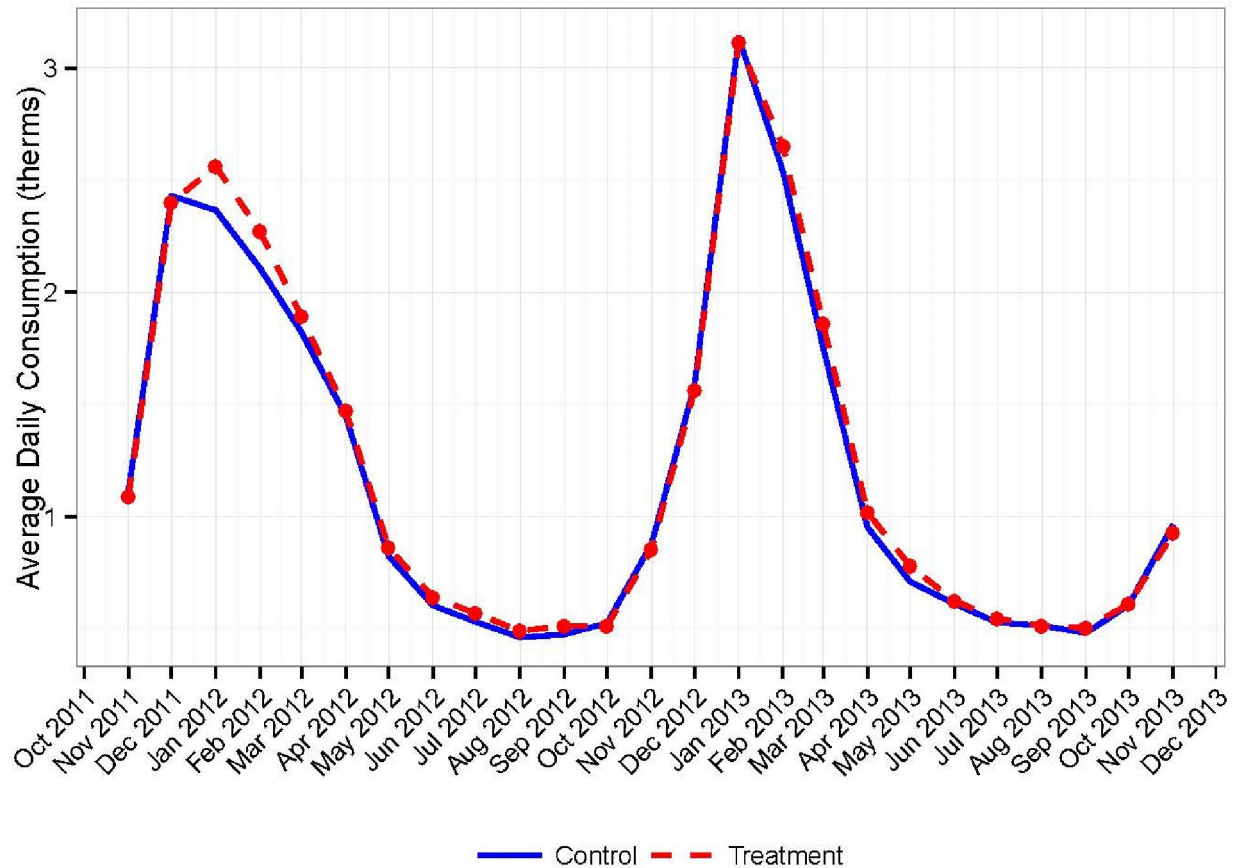


# Pilot Findings



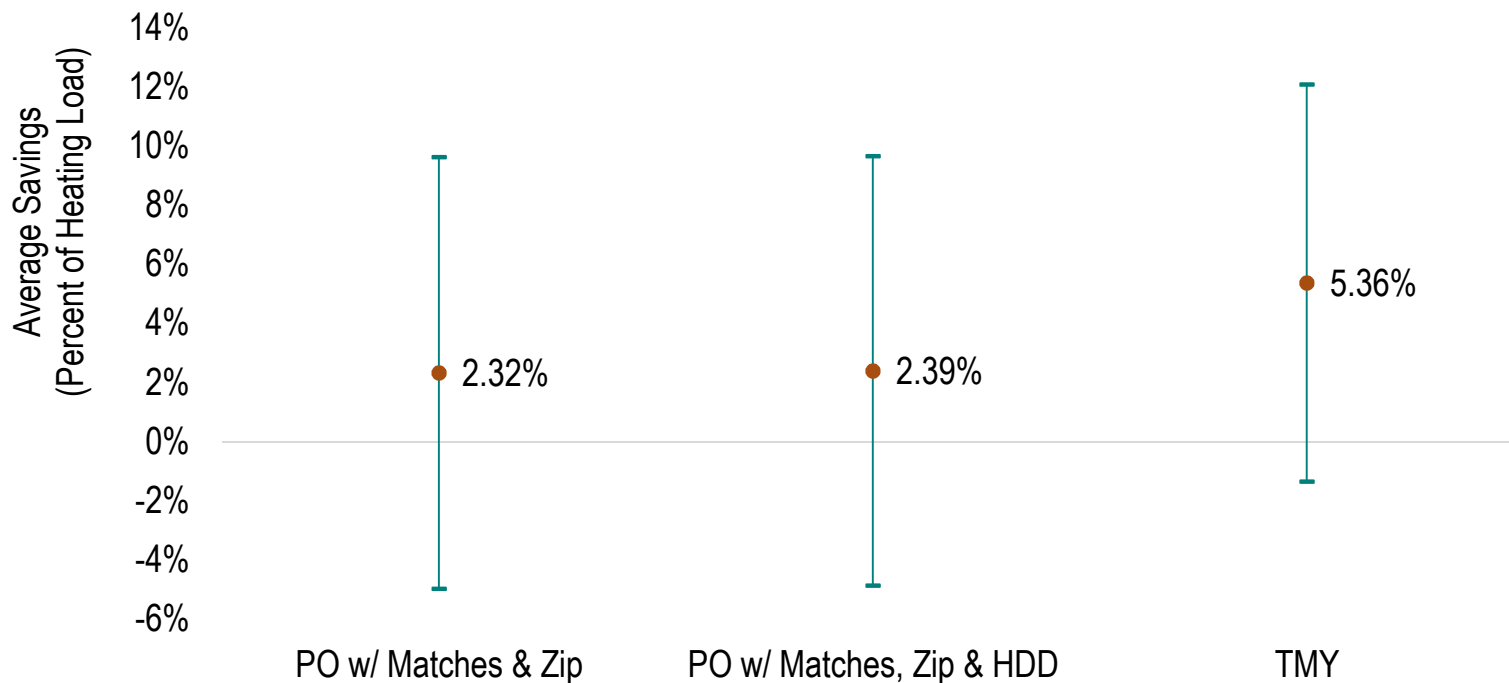
# Pilot Findings: Randomization

- Comparison of average daily therm usage in 25 months preceding pilot
- Significant differences identified in 8 of 25 months
- Approximately 0.1 therm difference (or 7% of average usage)
- Driven by geographic differences



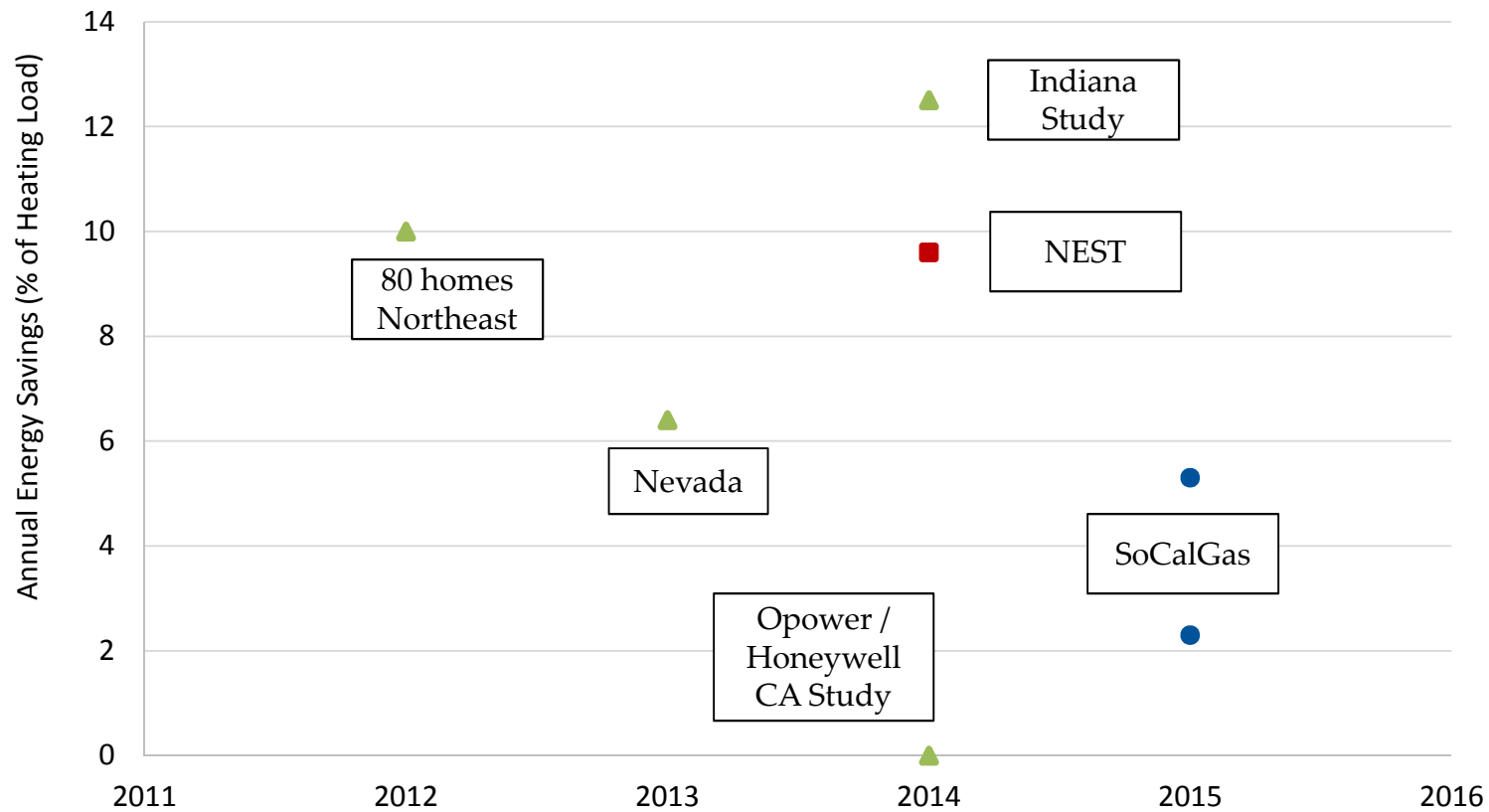
# Pilot Findings: Gas Savings

- Tested various modeling approaches to account for geographic differences
- Match on pre-usage and include a spatial fixed effect
- Power analysis suggests sample size of 5,000 was required
- Unusually mild winter in 2014/2015



# Pilot Findings: Gas Savings

- Relatively few studies
- Gas savings range from 0% to 12% for Tier III thermostats



# In Closing



## In Closing

- Nest thermostats seem to provide measurable gas savings
  
- Lessons learned include
  - There are many challenges associated with thermostat evaluations
  - Tradeoff between internal and external validity, as well as feasibility of implementation
  - Each new study provides better information for the next
  
- Next Steps
  - Electricity savings for summer period are currently being estimated
  - Assess customer satisfaction and willingness-to-pay for a smart thermostat
  - Obtain data from Nest to develop better insight into pilot population and compare to general population of Nest owners



# Key CONTACTS



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