When Are Smart Thermostats A Smart Investment?

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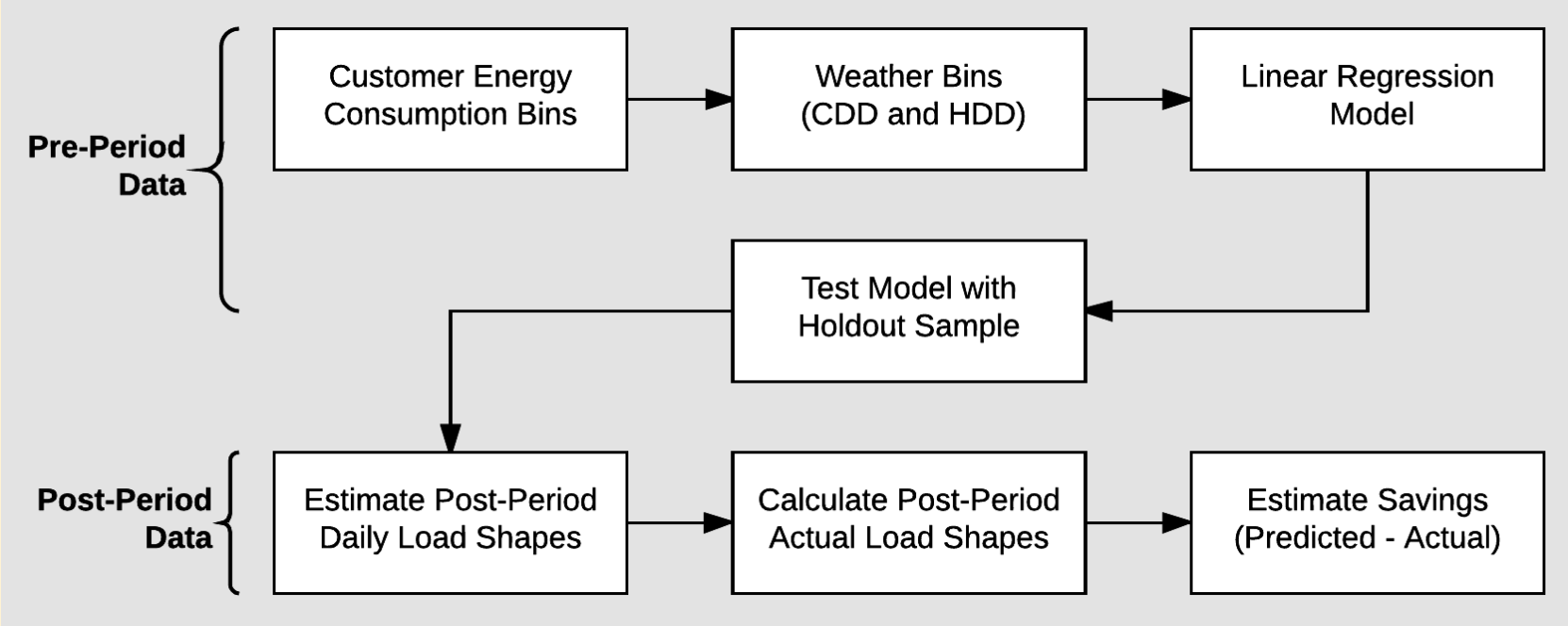
Introduction

Background

Study	Energy Efficiency	Optimization
Treatment	New connected smart t-stats Incentivized for demand response (DR)	Temperature set point optimization algorithm Opt-in invitation on t-stat display
Comparison	Future participants	Randomized control group
Timeline	June 2015 - June 2018	July - October 2017
Population	N=46,752 DR participants	N=73,529 (10,004 control)
Sample	n=26,099 Single-family, no solar	n=314 (56 control) Survey respondents

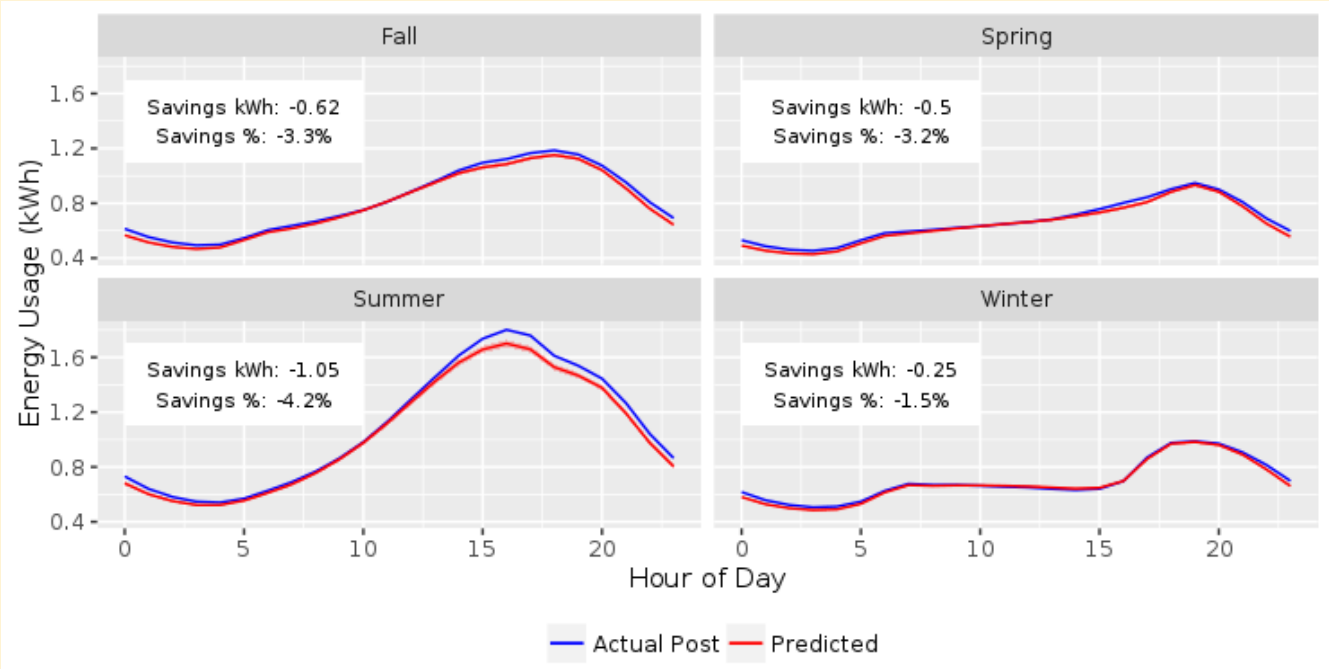
Methods

AMI Customer Segmentation (AMICS) Model



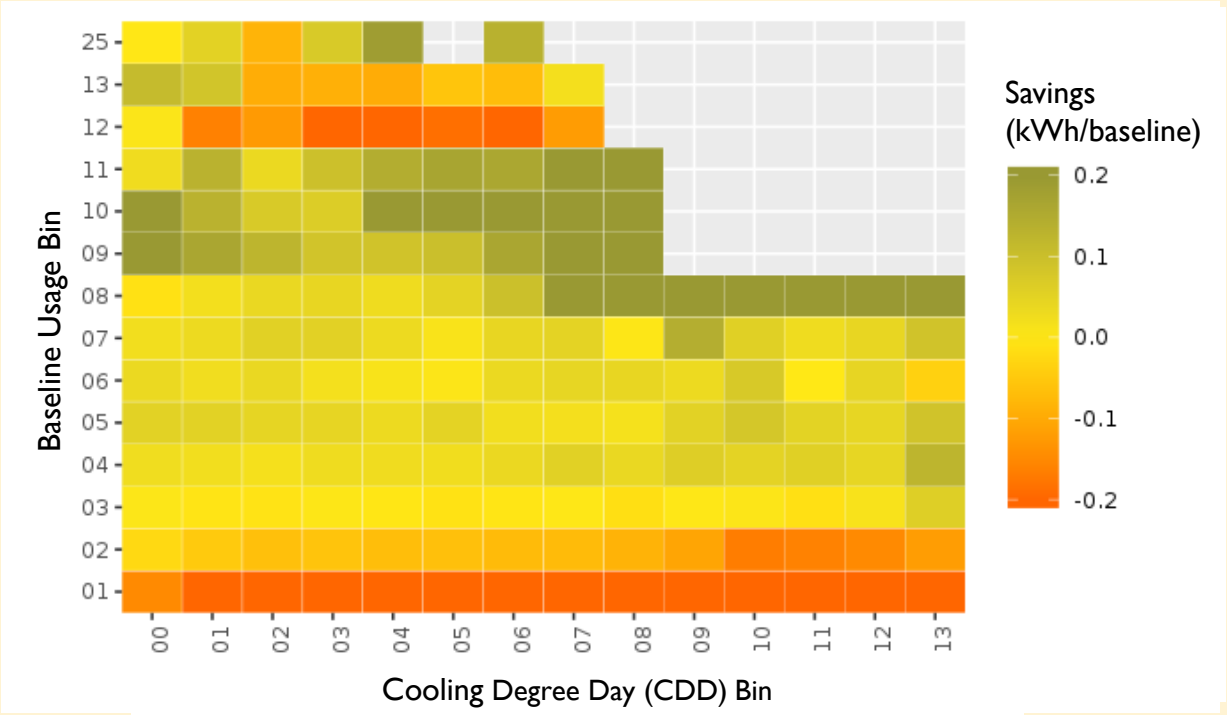
Efficiency

Change in Load Shape from T-stat Install



Efficiency

Heat Table of T-stat Energy Savings



Efficiency

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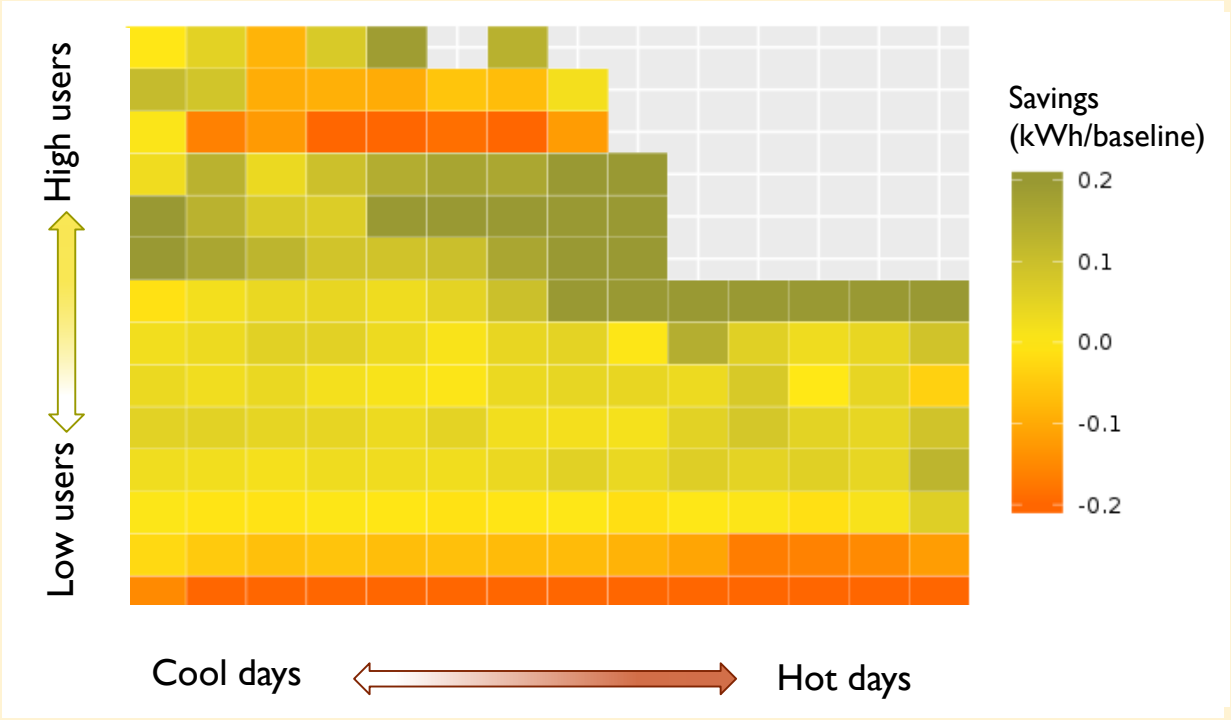
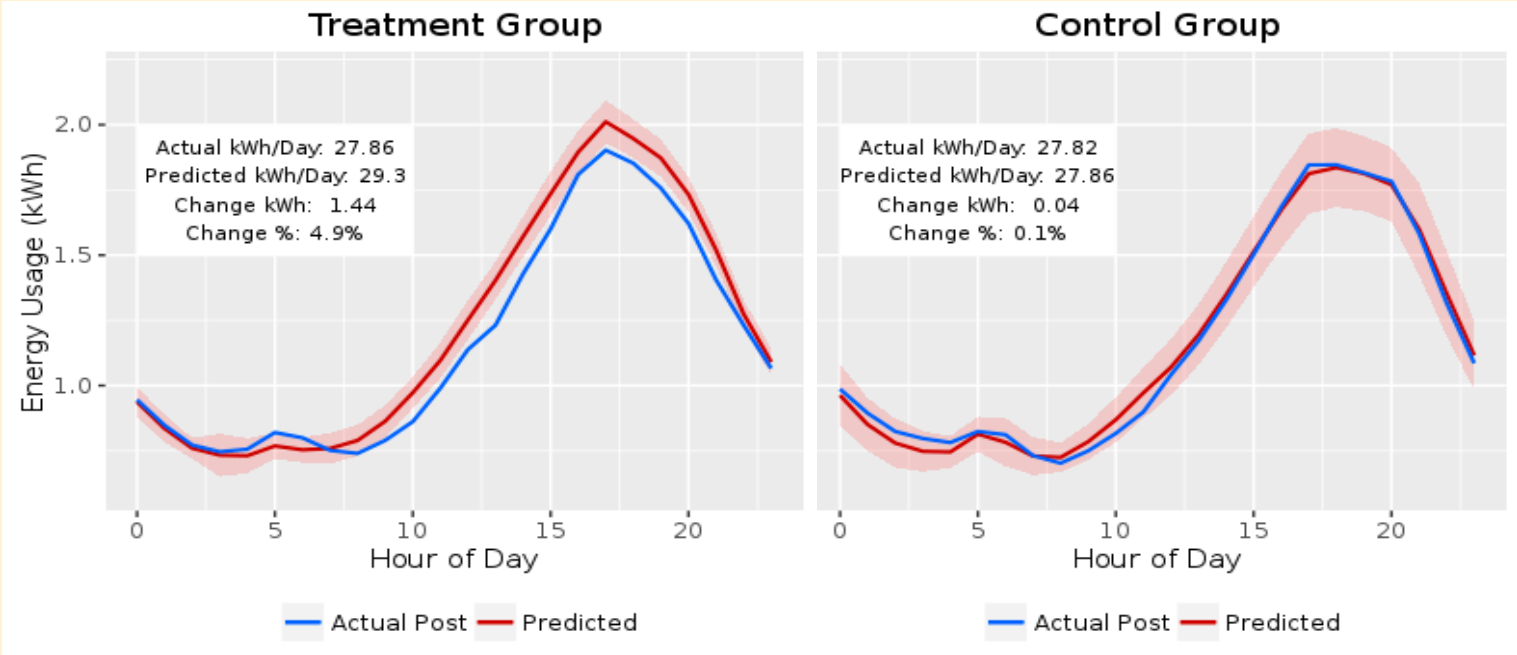


Optimization

Change in Load Shape from T-stat Optimization



What did we learn?

- T-stat led to significant kWh increase (negative savings) on average.
- Lowest energy users increased kWh, offsetting kWh savings in other usage tiers.
- Temp set point optimization saved kWh in existing t-stats.

Where do we go from here?

Target customers with moderate to high energy usage

Educate customers on how to choose efficient settings

Negotiate data sharing with t-stat vendors for future research

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