State and Local Energy Efficiency Action Network

- Network of 200+ leaders and professionals, led by state and local policymakers, bringing energy efficiency to scale
- Support on energy efficiency policy and program decision making for:
  - Utility regulators, utilities and consumer advocates
  - Legislators, governors, mayors, county officials
  - Air and energy office directors, and others
- Facilitated by DOE and EPA; successor to the National Action Plan for Energy Efficiency

The SEE Action Network is active in the largest areas of challenge and opportunity to advance energy efficiency
Insights from Smart Meters: Focus on Home Energy Report Programs

Annika Todd, Michael Li, Michael Sullivan

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Smart meters increasingly rolled out
What can we do with this data?
- Many possibilities
- Valuable for a range of energy programs

Today: focus on behavior-based (BB) programs
  - Specifically: Home Energy Report (HER) programs
  - An illustrative example of the value of this analysis
What is a HER program?

Welcome to your first home energy report. This report is part of a free program to help you save money and energy.

How you’re doing:

Great 😊😊

Good 😊

Using more than average

We estimate that you could save $150 each year.

Turn over for ways to save →
Key policy questions for HER (and BB) programs

Key policy questions:

1. Do these programs have potential to provide peak-hour savings? *(Yes – for our dataset)*

2. What actions and characteristics are related to savings? *(Suggestive of AC – best guess: changing thermostat set point)*

3. What is the short-term persistence of savings? *(Savings within one-two weeks after first report mailed, stabilize after second report)*
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• Smart meter data enables many opportunities for new forms of analysis
• Purpose of this study: focus on one particular aspect of this analysis enabled by smart meters – what insights can we gain into Home Energy Report (HER) programs?
• **Description of data**
• Analyses and results
• Conclusions and future research
• HER program implemented as a “randomized controlled trial”
• Hourly electricity data from Pacific Gas & Electric’s (PG&E) AMI system
• Two datasets from different rollouts (“waves”)

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<th># Treat</th>
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<th>PG&amp;E baseline territory</th>
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Outline

- Smart meter data enables many opportunities for new forms of analysis
- Purpose of this study: focus on one particular aspect of this analysis enabled by smart meters – what insights can we gain into Home Energy Report (HER) programs?
- Description of HERs, data, limitations of report
- **Analyses and results**
- Conclusions and future research
Key policy questions:

1. Do these programs have potential to provide peak-hour savings?
   **Analysis 1:** Estimate the hour-by-hour savings profile *(Wave One – late summer)*

2. What actions and characteristics are related to savings?
   **Analysis 2:** segment by customer characteristics to identify “high-savers” *(Wave One – late summer)*

3. What is the short-term persistence of savings?
   **Analysis 3:** segment across days after reports are mailed *(Gamma – winter and spring)*
Three analyses – each focusing on one key policy question

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   *(Gamma – winter and spring)*
Mailing 1

Day after mailing

Est savings, % of avg daily kWh

0% 1% 2% 3%

0 5 10 15 20 25

Day after mailing

Mailing 2

Day after mailing

Mailing 3

Day after mailing

Mailing 4
Mailing 1
Mailing 2
Mailing 3
Mailing 1

Mailing 2

Mailing 3

Mailing 4
• Smart meter data enables many opportunities for new forms of analysis
• Purpose of this study: focus on one particular aspect of this analysis enabled by smart meters – what insights can we gain into Home Energy Report (HER) programs?
• Description of HERs, data, limitations of report
• Analyses and results
• **Conclusions and future research**
• Limited data access
• Limited time period
• Only a few rollouts
• Lots of smart meter data
• Opportunity for new types of analysis
• Today – one example of the value of this data
• We show (for our datasets):
  1. Potential for peak-hour savings from HERs
  2. Savings driven by actions related to AC
  3. Savings show increase within one-two weeks of first mailing, stabilize after second mailing
• Many other examples of the value of this data
• Future – a lot of potential research
Questions?

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