Northeast Energy Efficiency Partnerships

Home Energy Management Systems: Harnessing the Savings

Hosted by:

Northeast Energy Efficiency Partnerships (NEEP)

The Home Performance Coalition (HPC)

2015 ACI National Home Performance Conference

Monday, May 4th, 2015

1pm-5pm

WELCOME, INTRODUCTIONS, AND BACKGROUND

- Northeast Energy Efficiency Partnerships (NEEP)
  - Claire Miziolek, Market Strategies Program Manager
- Home Performance Coalition (HPC)
  - Kara Saul-Rinaldi, VP of Government Affairs and Policy
- You
- The HEMS Working Group
- Background for the day

AGENDA AND HOUSEKEEPING

This is a working meeting, discussion is crucial

- Welcome and introductions, Setting the Stage
- What do we know about HEMS from Programs…
- …and Evaluation…
- *Coffee Break*
- HEMS Policy Opportunities
- HEMS Vendors: Lightning Round
- …and Customer Engagement!
- Discussions, Brainstorming, Next Steps

- Facilities
- Breaks
- Sign-in Sheet

NEEP

NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

"Accelerating Energy Efficiency"

MISSION

Accelerate the efficient use of energy in the Northeast and Mid-Atlantic Regions

APPROACH

Overcome barriers to efficiency through
Collaboration, Education & Advocacy

VISION

Transform the way we think about and use energy in the world around us.

One of six Regional Energy Efficiency Organizations (REEOs) designated by U.S. Dept. of Energy

STRATEGIES

MISSION
Accelerate energy efficiency in homes, buildings & industry in the Northeast – Mid-Atlantic region

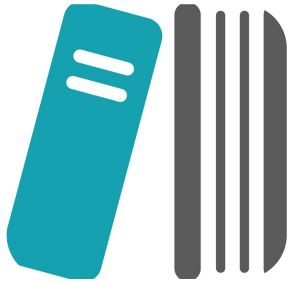
GOAL
Keep the region a national leader in accelerating energy efficiency

STRATEGIES

Reduce Building Energy Use

Speed High Efficiency Products

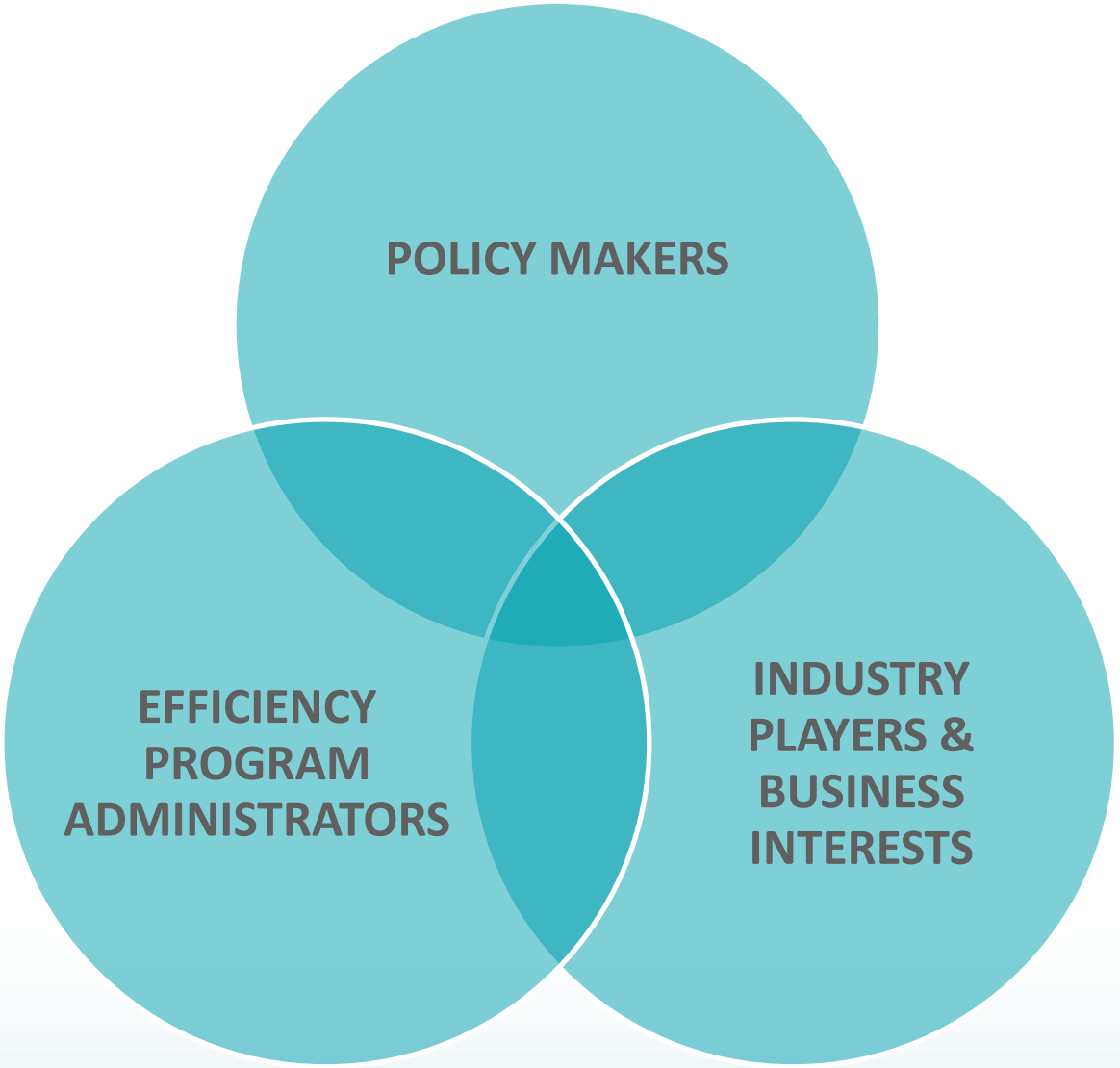
Make Efficiency Visible



Advance Knowledge - Best Practices

Regional energy efficiency collaborations since 1996

NEEP STAKEHOLDERS



THE HOME PERFORMANCE COALITION

- National, non-profit, 501c3 organization
- Supports whole-house upgrade programs through research and convening projects
- Addresses challenges and barriers through research and policy projects
    - Standards to reduce data-related pain and suffering
    - Making the value of energy efficient homes visible
    - Smart grid and home performance intersections
    - Cost-effectiveness testing
    - Weatherization and Home Performance

HPC STAKEHOLDERS

Home Performance Coalition

- State energy offices
- Program implementers
- Utility Sector
- Manufacturers
- Non-profit stakeholders
- Contractor Connection: Efficiency First

INTRODUCTIONS

- Show of hands, are you…
  - A utility/program administrator
  - A HEMS Vendor/Manufacturer
  - Support Contractor
  - Consultant
  - National Lab
  - Non-profit
  - Government
  - Other

Are you coming from…

- East Coast
- West Coast
- The middle
- New Orleans?

- Round Robin in the room:
  - Who are you?
  - What organization/company do you represent?
  - (don't forget to sign in)

THE HEMS WORKING GROUP

- Start a national conversation on HEMS focused on their integration with energy efficiency activities
- Set a path for HEMS technology to evolve with efficiency as a major component
- Develop common objectives, terminology, and goals in the HEMS space

- NEEP's Focus: find ways to integrate HEMS into NE energy efficiency programs and program development
- NHPC's Focus: engagement with smart grid, policy, smart grid devices, and HEMS to advance energy efficiency.

GETTING ON THE SAME PAGE: WORKING DEFINITION OF "HEMS"

- **H**ome
- **E**nergy
- **M**anagement
- **S**ystem(s)
- a device* that can control more than 1 function** of a home using some level of automation*** with a user interface****
  - *can be physical, virtual, software, etc
  - **i.e. HVAC, lighting, plug loads, appliances, etc.
  - ***can be advanced or very simple
  - ****wide open on what this actually means

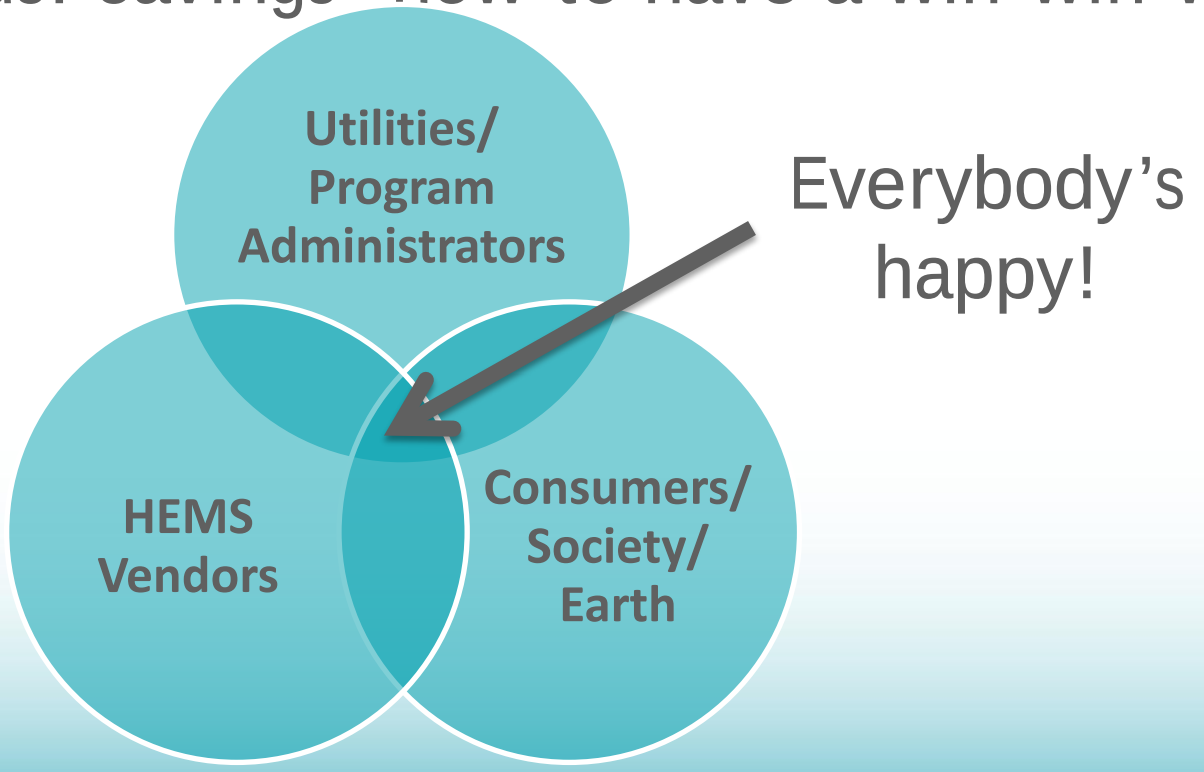
THE HEMS WORKING GROUP

- Started in 2014
- Stakeholders include:
  - program administrators
  - HEMS manufacturers/software
  - thought leaders in this space
- Co-facilitated by NEEP and HPC
- Meet every-other-month for 1.5hr webinars
  - Next meeting Thursday, 5/14 at 12pm EST

*want to join? Sign up now!

HOME ENERGY MANAGEMENT SYSTEMS: STILL THE WILD WEST?

- HEMS Working Group and many projects/studies have helped define this space
  - Market Characterization of HEMS for PGE
- Many challenges to adoption still exist
- Today's focus: Savings—how to have a win-win-win?



NEEP HEMS RESEARCH PROJECT

- Technology assessment:
  - Update most recent HEMS inventories
- Potential of HEMS as M&V tool:
  - Assessing the opportunity of HEMS as an M&V tool to measure and verify other efficiency measures within a home
- Program activity assessment:
  - Cataloguing HEMS programmatic activity
- Opportunity assessment:
  - Determine where the greatest program opportunity lies (i.e. M&V, retail products, demand response, home performance, behavioral), including determining savings assumptions, unit costs/savings, applicability and scale for the Northeast
- Recommendations for further study
- Policy opportunities/recommendations:
- In-Person Workshop: Monday, 6/15 at Schneider Electric's new HQ in Andover MA, more details to come

COMMON CRITERIA DOCUMENT

- Working Group project: Common Criteria document
- As vendors and PAs are putting programs together, a need for a common set of expectations around data collection and sharing, functionality, and reporting emerged
- Without ENERGY STAR or another labeling process in place for HEMS, it's a challenge to set common expectations
- Speaking of ENERGY STAR…

ENERGY STAR

- ENERGY STAR covered programmable thermostats until 2009 when they sunset the program
- Now are working on a new Climate Control spec which would cover smart thermostats
- While not finalized, the approach boils down to: "we don't care how you're getting the savings, just that you're getting the savings"
- This will be very helpful to have a QPL, but as we're figuring out this technology and HEMS moves beyond the thermostat, there's still more to figure out…

GOALS FOR TODAY'S WORKSHOP

- Discussion of what opportunities exist with HEMS Systems, including focus on evaluation and customer engagement
- Deeper clarity on the energy savings potential of HEMS
- Clear next steps for each of you, channeled through the HEMS Working Group
- **Reminder: Note cards and sign in sheet**

Any questions?

What do we know about HEMS…from Programs

Carlyn Aarish

Cadmus Group

CADMUS

Nest Learning Thermostat: Can You Teach an Old Thermostat New Tricks?

Carlyn Aarish

May 6, 2015

Evaluation Objectives

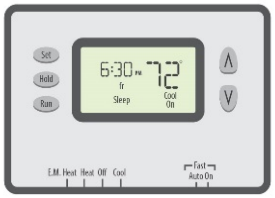
Gas saved on heating
(Gas furnaces)

Electricity saved on cooling
(Central AC)

Program Design

Test

N = 1,400



n = 700

n = 700

Control

N = 4,645

Program Eligibility

Duel-fuel customer

Homeowner

Manual thermostat

Gas furnace

Central AC

Occupied home 1 year, planning to stay 1 year

Recruitment

1. Identifying eligible participants
   - Home Energy Assessment data

2. Recruiting participants
   - Flyers
   - Phone calls

Evaluation Methods

Pre/Post billing analysis

Evaluation Methods

Pre/Post billing analysis

Indoor temperature metering

Evaluation Methods

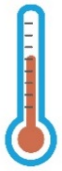
Pre/Post billing analysis

Indoor temperature metering

AC run time metering

Evaluation Methods

Pre/Post billing analysis



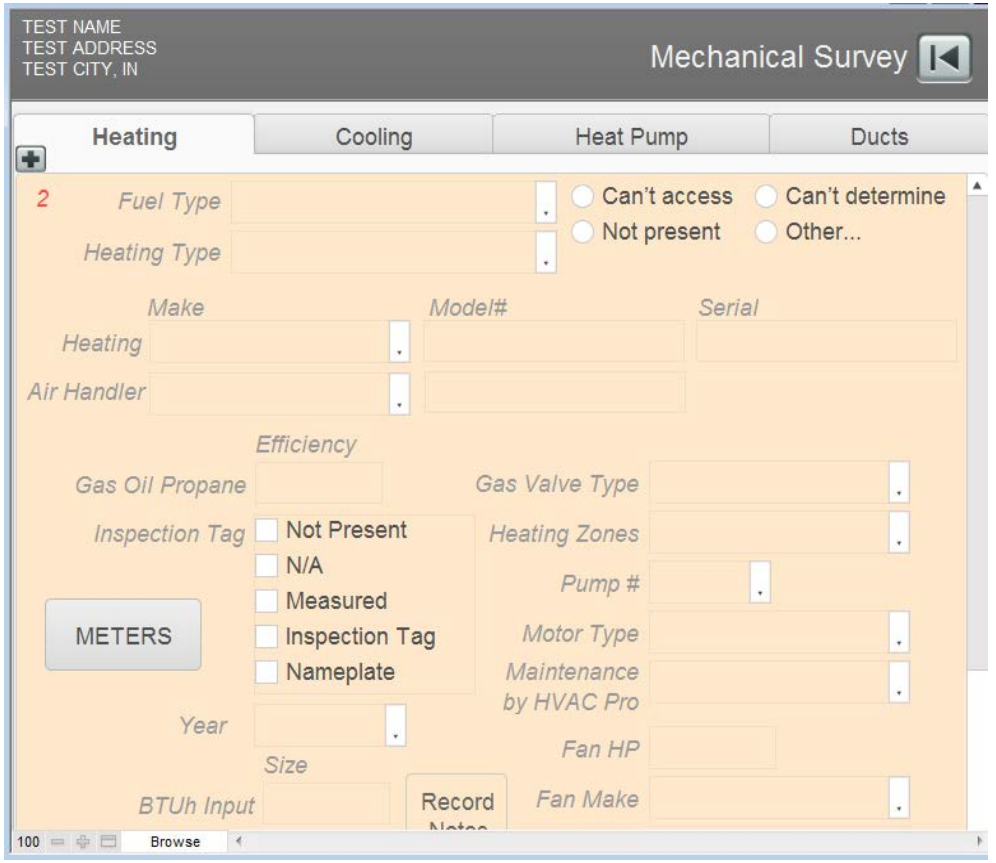
Indoor temperature metering

AC run time metering

Participant surveys

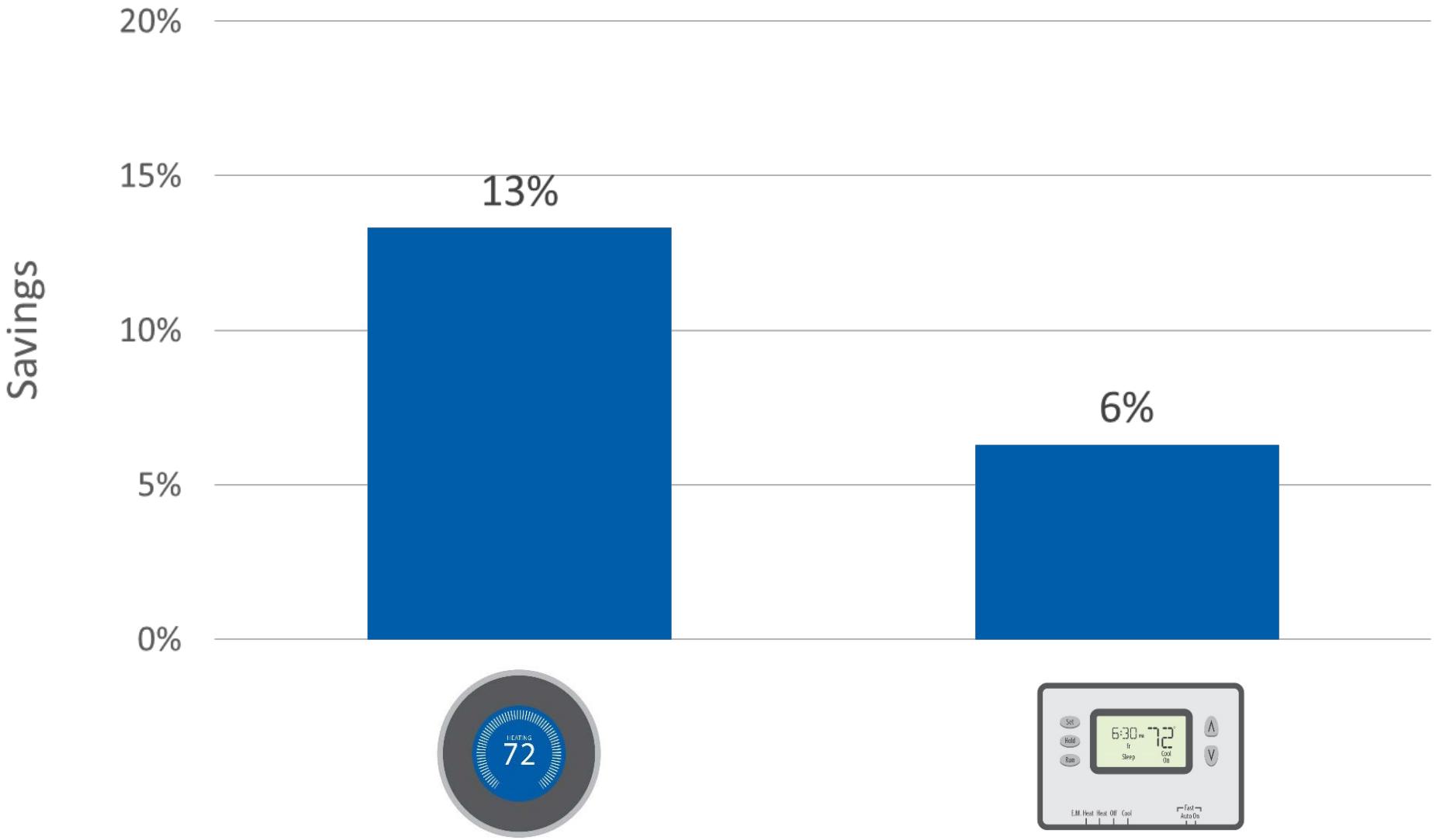
Program Implementation

- Direct install
- Participant survey
- Basic thermostat training
- Data logger installation
- HVAC nameplate data collection

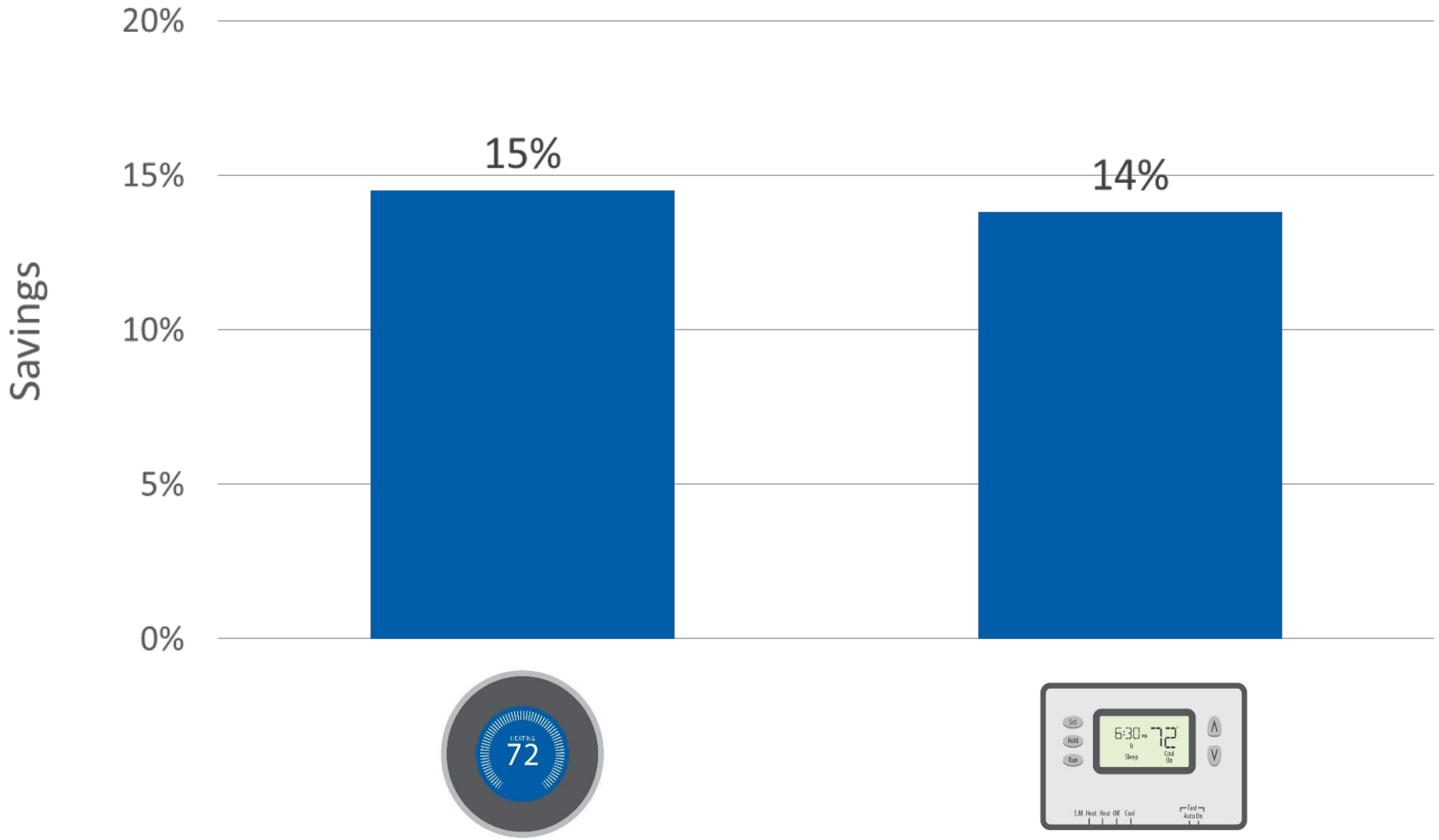


Results

Heating Season Gas Savings



Cooling Season Electric Savings



Taking Analysis Further

Taking Analysis Further

- **What are impacts if paired with DR program?**

Taking Analysis Further

- What are impacts if paired with DR program?
- **Do savings persist over time?**

Taking Analysis Further

- What are impacts if paired with DR program?
- Do savings persist over time?
- **How do other smart thermostats compare?**

Taking Analysis Further

- What are impacts if paired with DR program?
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- How do other smart thermostats compare?
- **What are impacts in different climate regions?**

Taking Analysis Further

- What are impacts if paired with DR program?
- Do savings persist over time?
- How do other smart thermostats compare?
- What are impacts in different climate regions?
- **What are impacts on different HVAC equipment?**

Taking Analysis Further

- What are impacts if paired with DR program?
- Do savings persist over time?
- How do other smart thermostats compare?
- What are impacts in different climate regions?
- What are impacts on different HVAC equipment?
- **What are impacts on home diagnostics?**

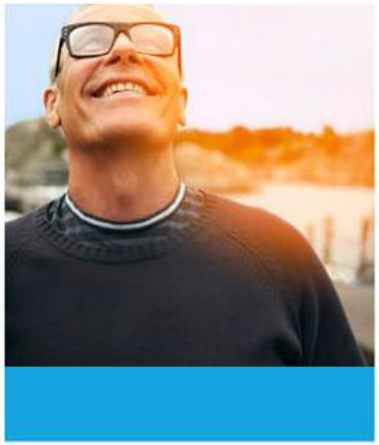
Taking Analysis Further

- What are impacts if paired with DR program?
- Do savings persist over time?
- How do other smart thermostats compare?
- What are impacts in different climate regions?
- What are impacts on different HVAC equipment?
- What are impacts on home diagnostics?
- **What are impacts with home energy monitoring?**

Taking Analysis Further

- What are impacts if paired with DR program?
- Do savings persist over time?
- How do other smart thermostats compare?
- What are impacts in different climate regions?
- What are impacts on different HVAC equipment?
- What are impacts on home diagnostics?
- What are impacts with home energy monitoring?
- **What areas would YOU examine?**

CADMUS



Carlyn Aarish

Senior Analyst

617-673-7139

carlyn.aarish@cadmusgroup.com

DISCUSSION QUESTIONS

- What are impacts if paired with DR program?
- Do savings persist over time?
- How do other smart thermostats compare?
- What are impacts in different climate regions?
- What are impacts on different HVAC equipment?
- What are impacts on home diagnostics?
- What are impacts with home energy monitoring?
- **What areas would YOU examine?**

...from Evaluation...

Emily Kemper
CLEAResult

CLEAResult

NEEA HEMS Auto M&V Research

Emily Kemper, Senior Engineering Manager

May 4, 2015

We change the way people use energy™

Agenda

- Disclaimers!
- Goals of the Research
- Literature Review
- HEMS Industry Research
- Data Analysis and Baseline Development
  - Individual Home Regression Analysis
  - Pooled Data Analysis
- Conclusions and Recommendations

Disclaimer #1

- This report has not been published yet!
- Scheduled for publishing May 11
- Check here for updates: http://neea.org/resource-center
- Official Title:

"Development of a Baseline Energy Modeling Approach for Residential M&V Applications Using Electric Interval Data"

Prepared by:

Eliot Crowe, Alex Reed, Hannah Kramer, Joan Effinger, Emily Kemper, and Mary Hinkle

Disclaimer #2

- I am an Architect and Building Scientist

← Not a regression modeling expert!

I can explain conceptually what was done with the big data in this project but please follow up with me via email for specific questions ☺

Goals of the Research

Goals

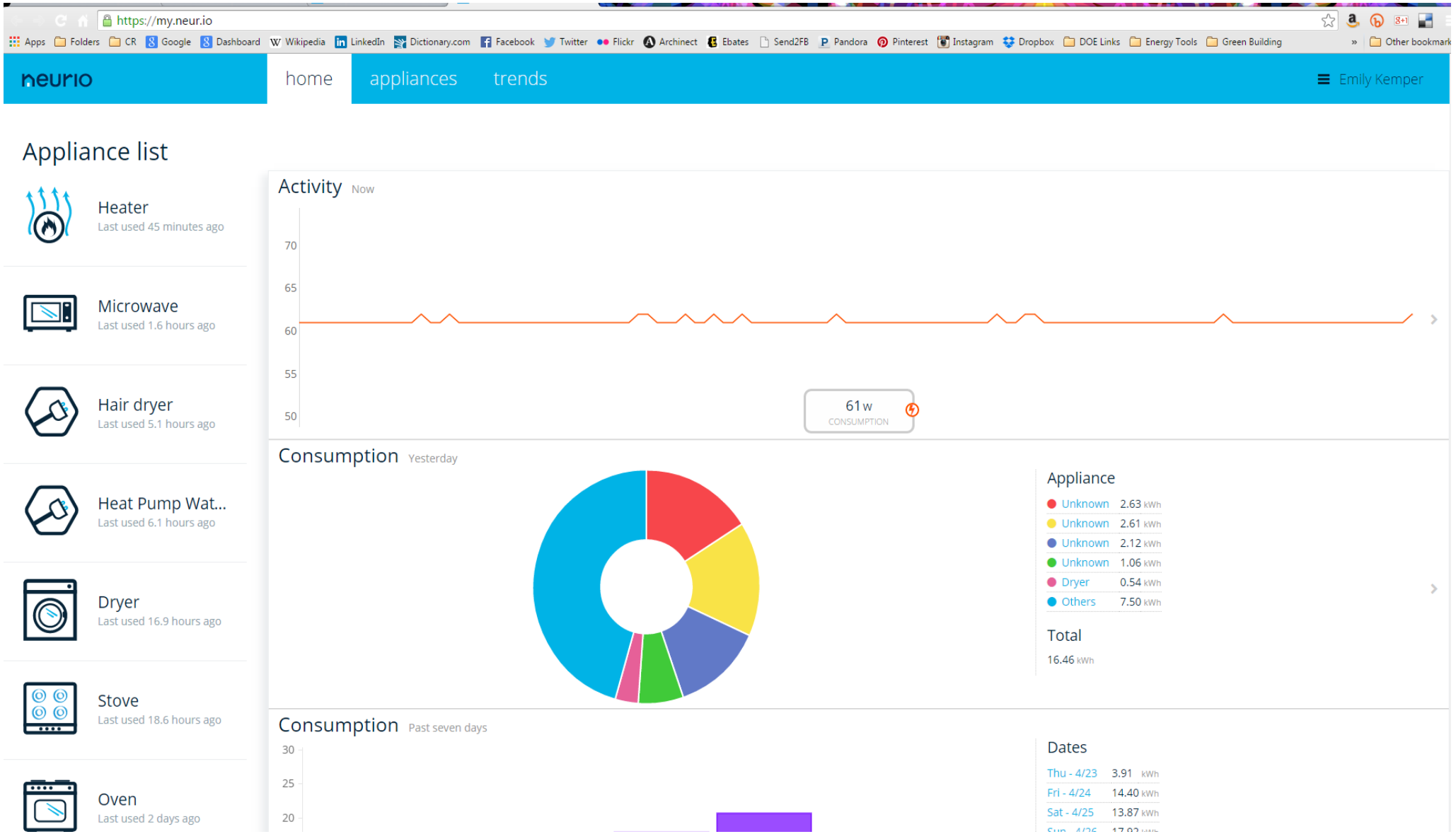
- Why explore the automated M&V potential of hardware and software platforms for residential programs?
  - Interval data from smart meters is becoming more available and driving the development of consumer-facing analytical software
- What do HEMS have to do with it?
  - HEMS provide an avenue to the data, and to communicate with both homeowners and utilities
  - HEMS *may* enable M&V

Goals

- This presents new opportunities:
  - To allow more variety and quicker onboarding of **program measures**
  - To determine **interim savings estimates** during program implementation
  - To provide **ongoing feedback** for utility customers
  - To support an array of **financial transactions** based on measured energy savings

What does this all mean?

Can HEMS deliver savings?



CLEAResult

Three parts to the Research

- Literature Review
  - What is out there? What has been done using interval data?
- HEMS Industry Research
  - Have any tech companies or manufacturers developed M&V tools in their devices or platforms?
- Data Analysis and Baseline Development
  - Individual Home Regression Analysis
  - Pooled Interval Data Regression Analysis

Findings From Literature Review

Lit Review: Major Observations

- Roughly 17 documents reviewed focused on **state of the art in residential M&V approaches**
- *Industry-recommended* sampling approach for evaluating residential BBEE programs **remains RCT**, but not always used
- Barriers include lack of access to interval data, lack of awareness of advanced M&V approaches, and the impact of occupant-controlled loads

Five Pilot Evaluations Using Whole Home Data

	RCT	Matched Control Group
Monthly	• PG&E Smart T-stat Field Assessment (2014)	• Cape Light Compact Legacy Cohort (2013)
Daily	• Google PowerMeter Evaluation (2012)	• Cape Light Compact Energize Cohort (2013) • PG&E HAN Evaluation (2013)
Interval: hourly or 15 minute or less	**None found: this is an opportunity**	

HEMS Industry Research

HEMS Industry Research

- Many technology platforms and device manufacturers are playing in the HEMS space
- …But, we discovered that most do not have M&V capabilities
  - 12 companies contacted
  - Six interviews conducted
  - Only two offer levels of M&V that might merit consideration for a utility program
  - No known platforms using real-time whole-home interval data to conduct utility program M&V

Tendril's ESM Platform

- Energy Services Management (ESM) Creates a whole building simulation according to IPMVP Option D, calibrated with monthly utility bills and other data
- ECMs applied in simulation and savings calculated as difference between energy use in the baseline and in the retrofit simulation models

EnergySavvy's Optix: Quantify

- Enables a "measure-as-you-go approach, measuring performance in real-time by combining usage, weather, and project data"
- Based on ASHRAE Guideline 14
- Variable balance point heating and cooling degree-day regression model applied on an individual home basis
- Used on 3000 homes thus far with monthly data

Data Analysis and Baseline Development

Individual Home Baseline Regression Modeling

- Objective: develop a specification for a robust baseline modeling approach
- Used two key metrics:
  a) Mean Bias Error (MBE)
  b) Detectable Percent Savings
- Used interval data provided by NEEA's Residential Building Stock Analysis (RBSA) metering study
  - 96 homes
  - NO program implementation on these houses

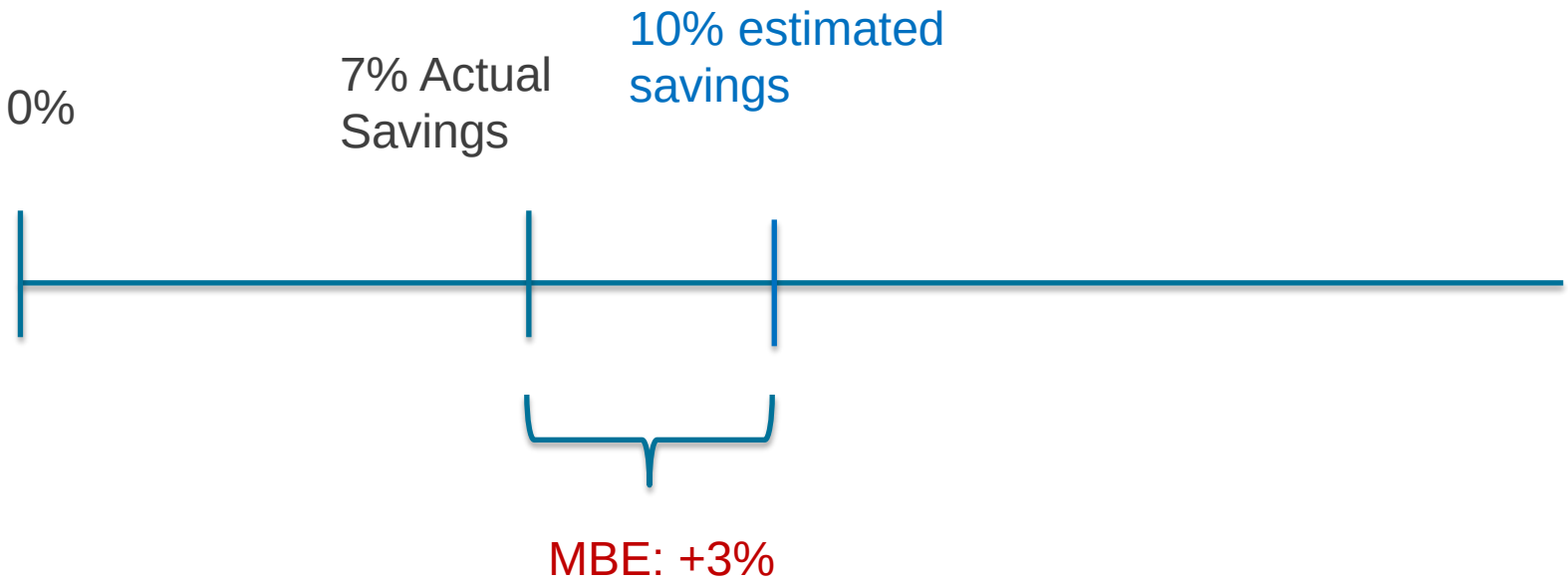
a) Mean Bias Error

- MBE denotes the percentage by which a regression model's predicted energy use differs from the actual consumption over a defined period.
  - A **positive MBE** means the modeled energy use for the period is higher than actual use, and a **negative MBE** means it is lower. An MBE value of zero is ideal.

Metrics Explanation

Metrics Explanation: MBE

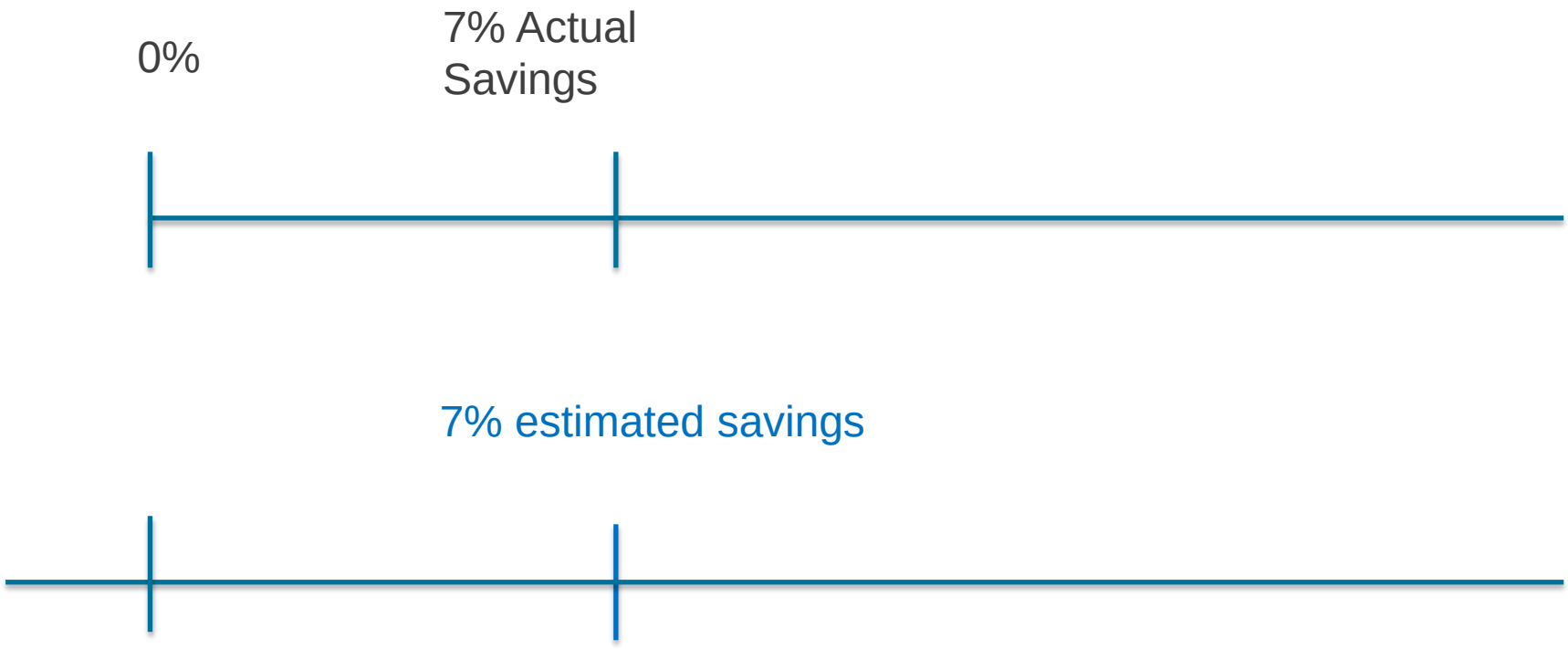
Metrics Explanation: MBE



b) Detectable Percent Savings

- M&V approaches based on monthly energy regression modeling may generally be used when energy savings are at least 10% of whole-building energy use. An M&V method based on interval data modeling has the potential to detect a lower percent savings.
  - Meaning, using interval data might allow us to “see” smaller savings amounts

Metrics Explanation: Detectable Percent Savings



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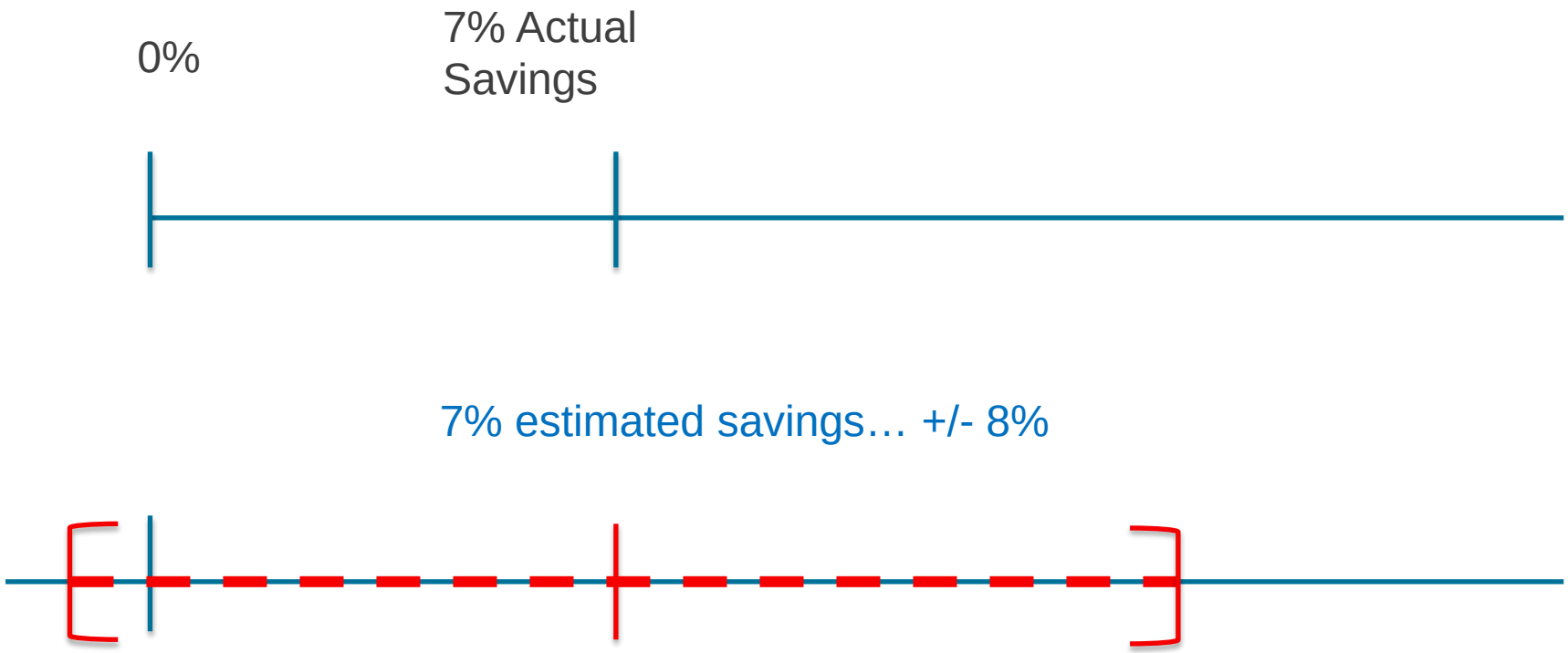

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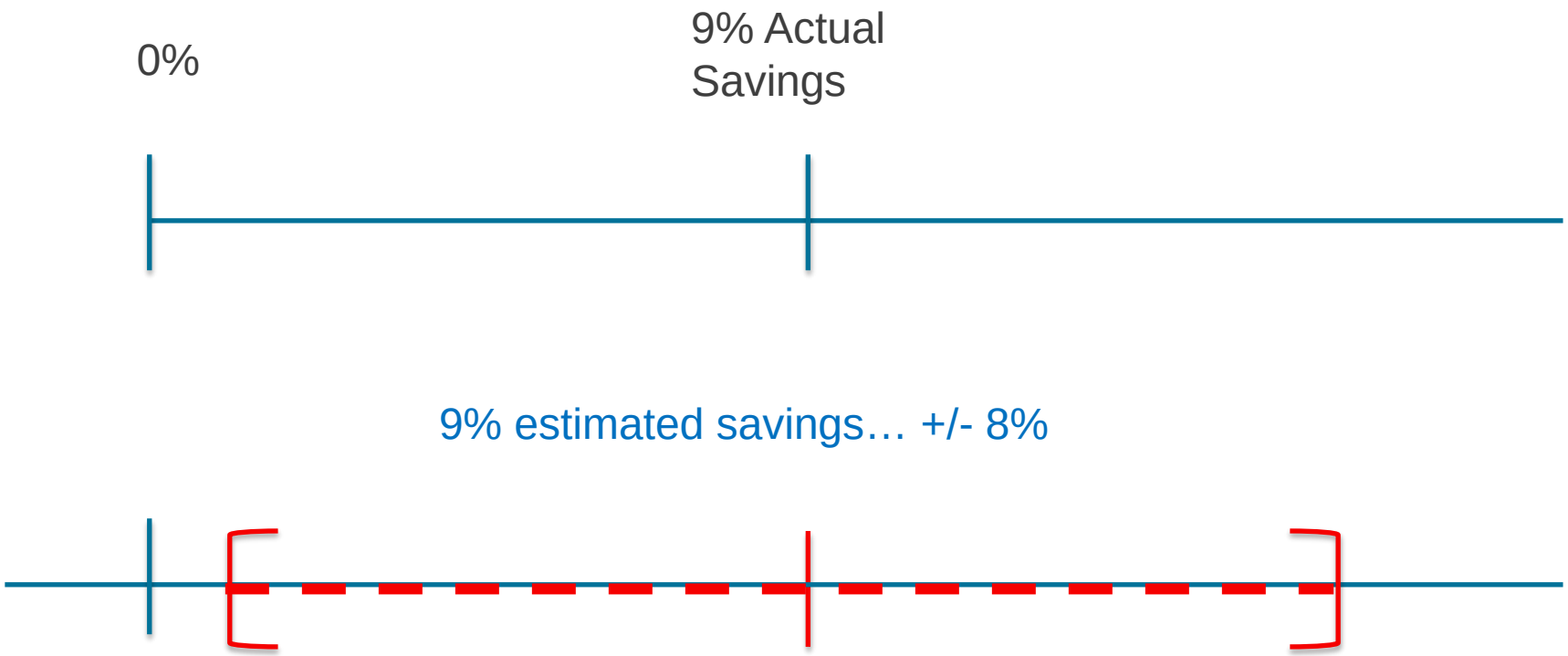

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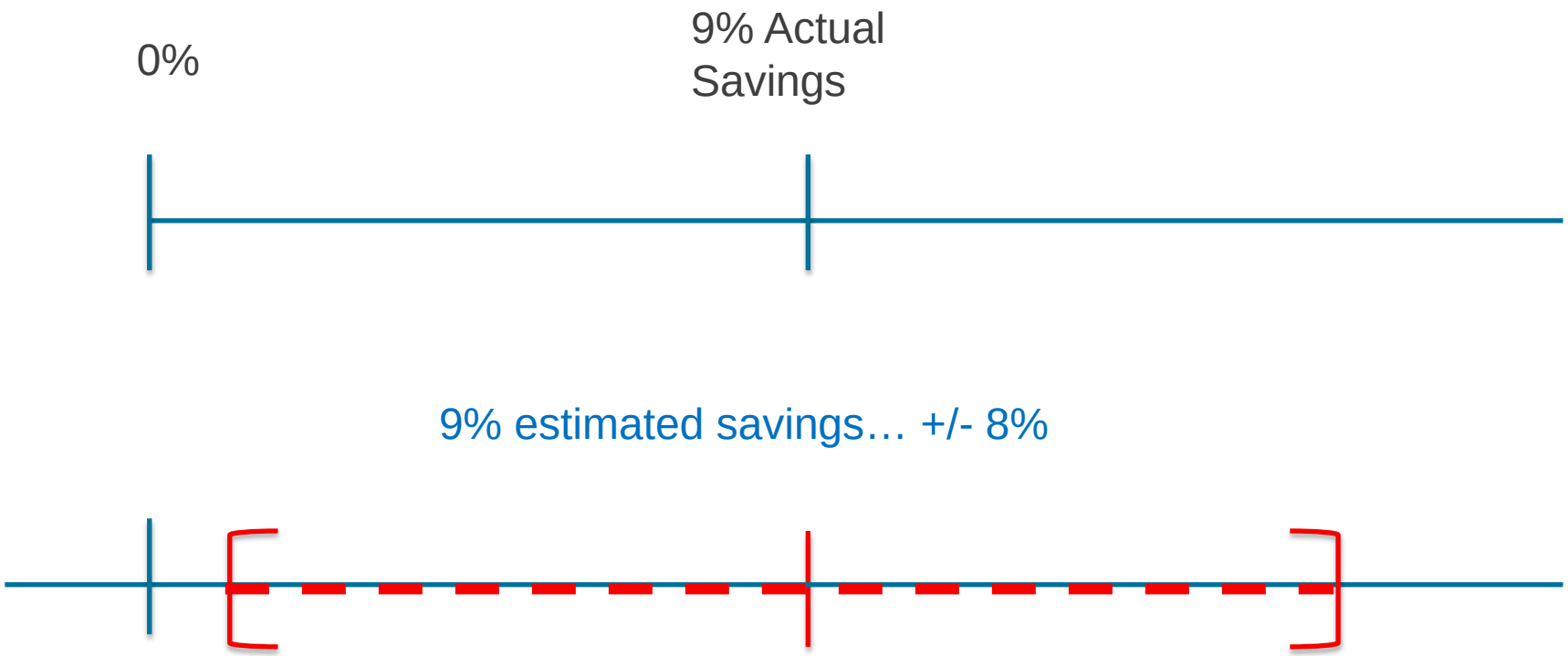

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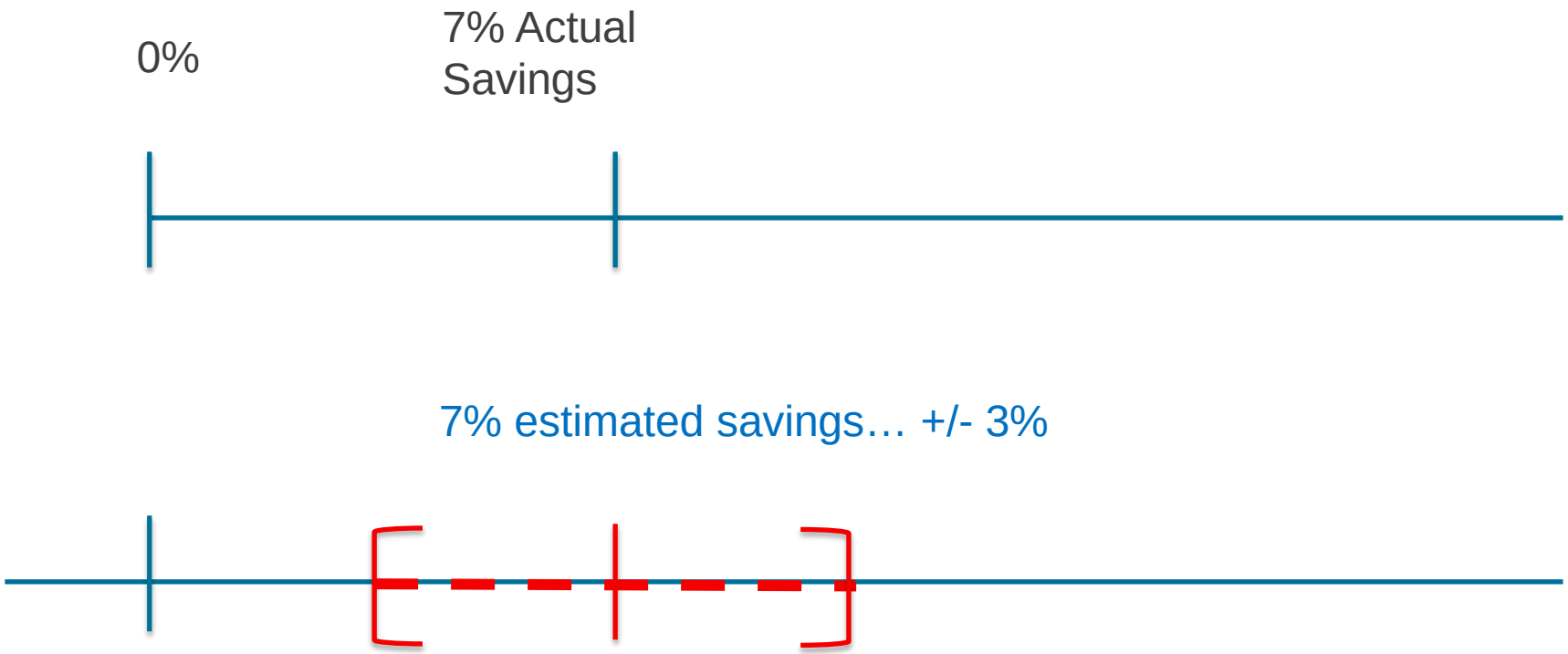

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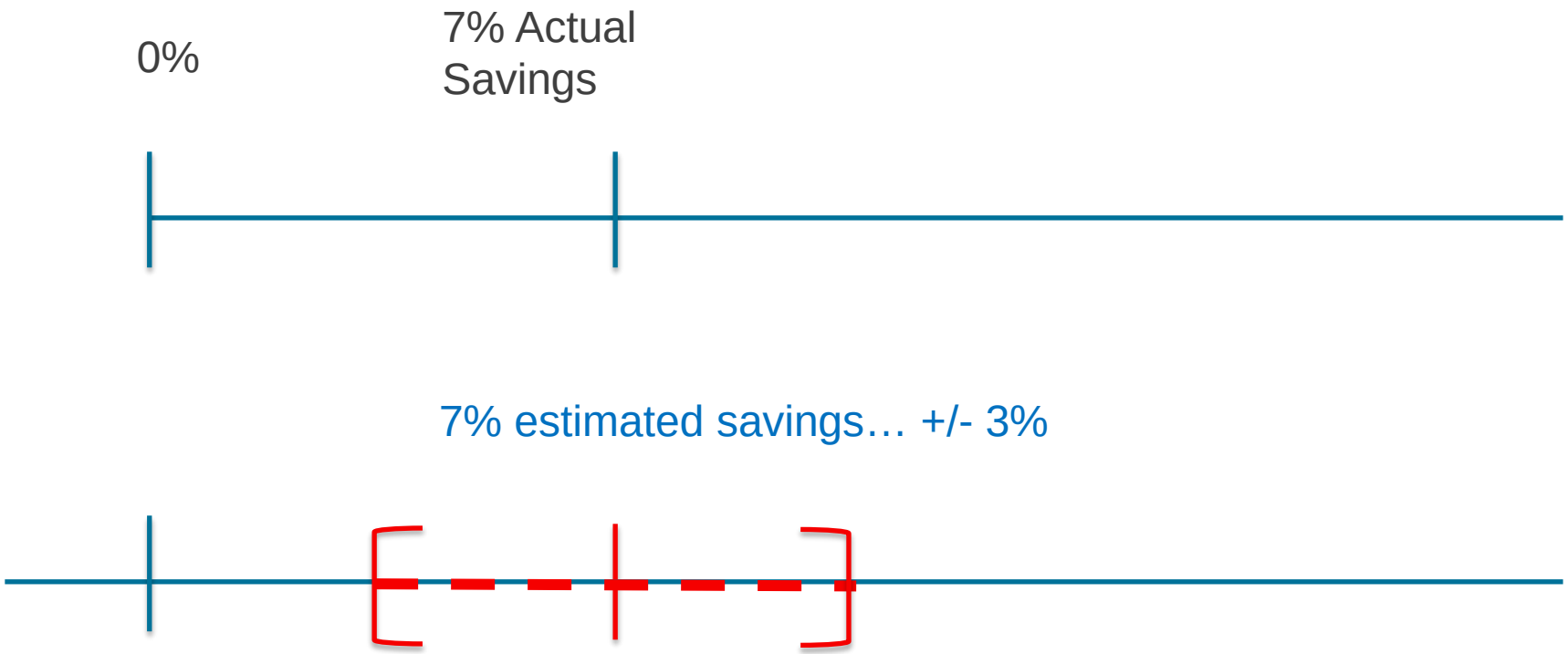


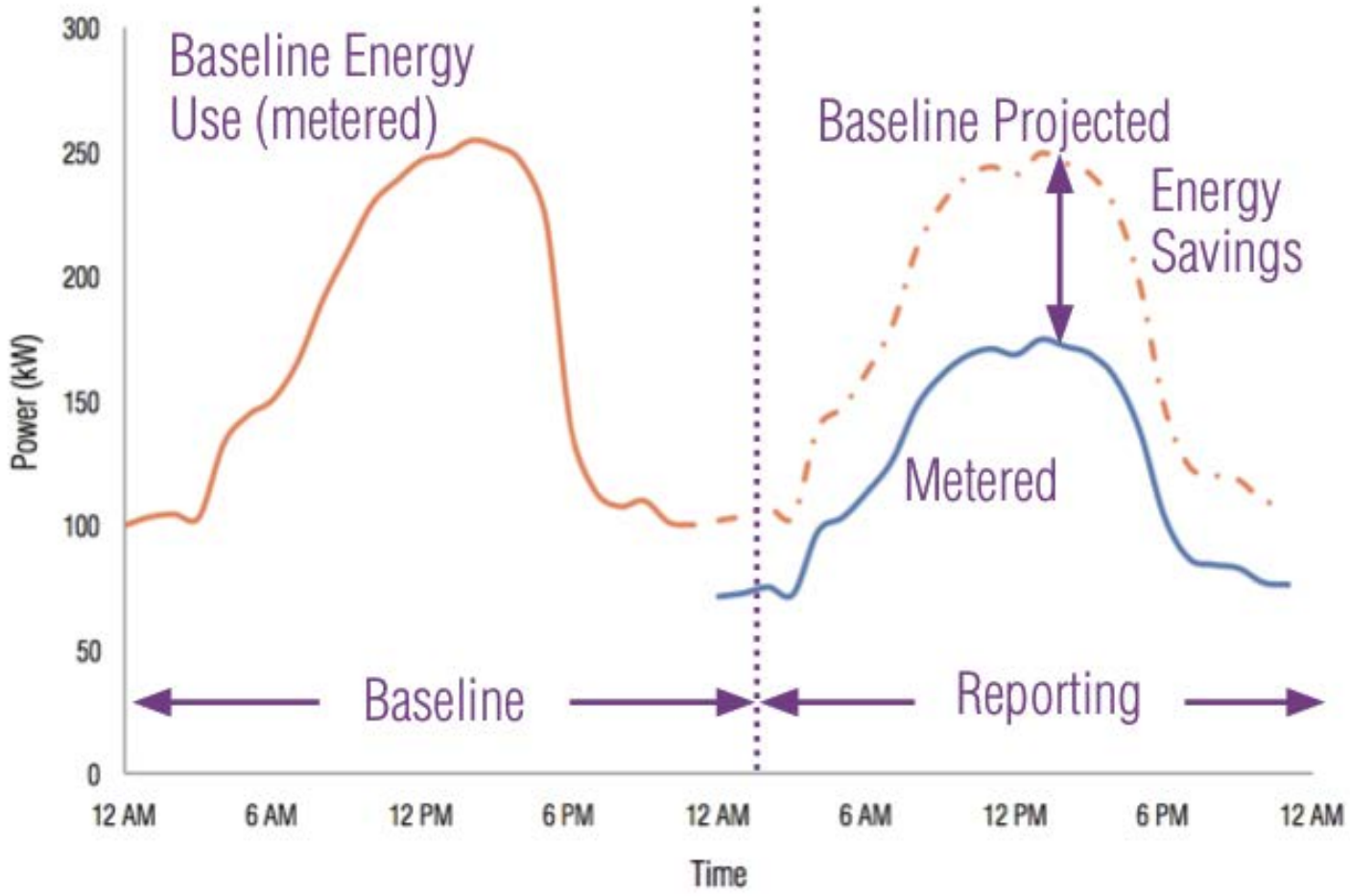
Percent savings needed: 3%

Methodology: Model Specification

- Multi-variate piecewise regression model using:
  - Air Temperature
  - Day of the Week
  - Time of Day
- Correction for Auto-correlation (outlined in ASHRAE Guideline 14 – 2002)
- **Avoided energy approach could not be used since there was no post-implementation data available**

Baseline Development

- *Error in reported savings is proportional to error in baseline/projected baseline*

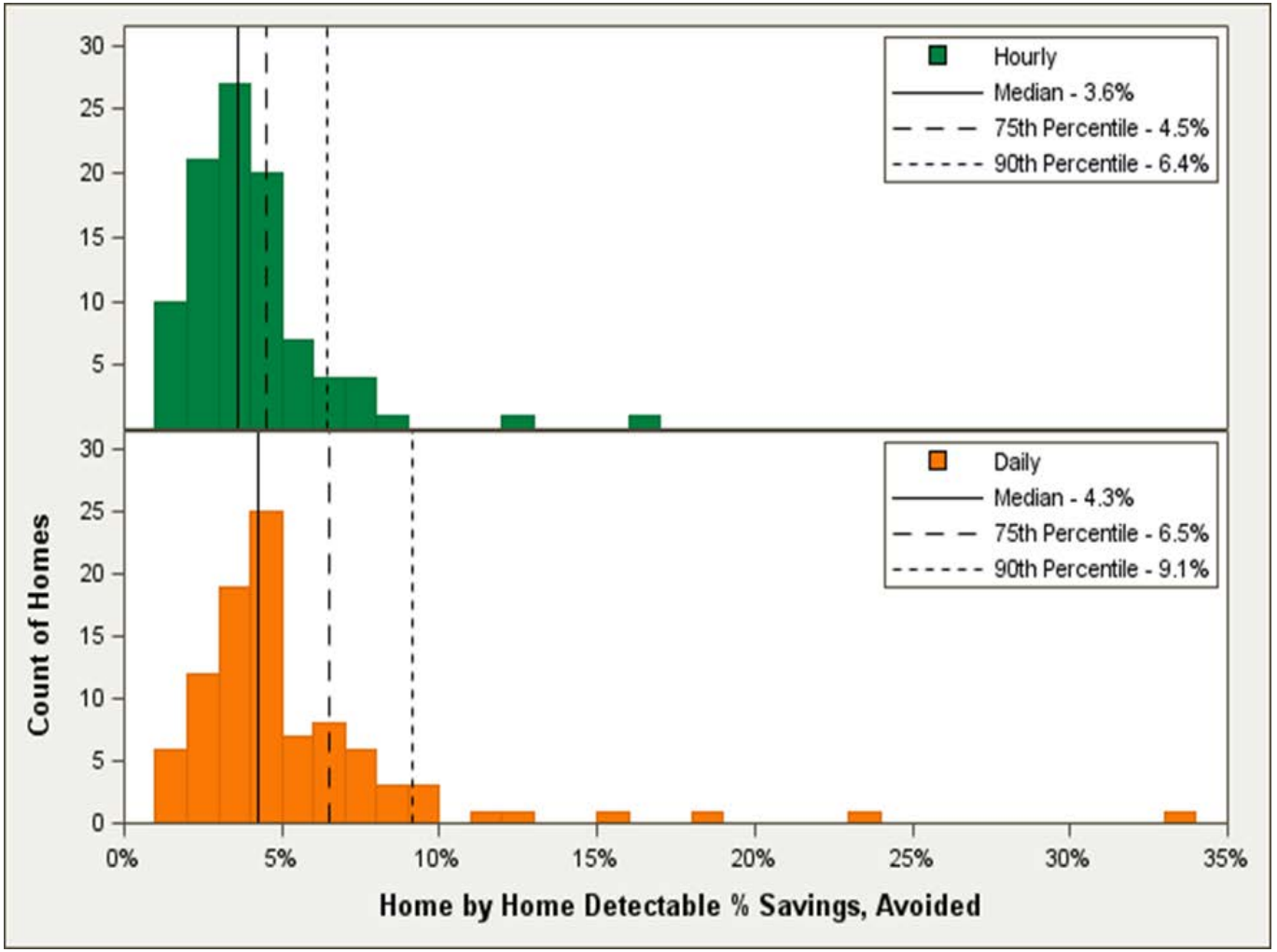


Findings

- Two separate datasets:
  1. Daily consumption: these models yielded a median value for detectable percent savings of 4.3%
  2. Hourly consumption: these models yielded a median value for detectable percent savings of 3.6%
- …Therefore, hourly models were used for subsequent analysis

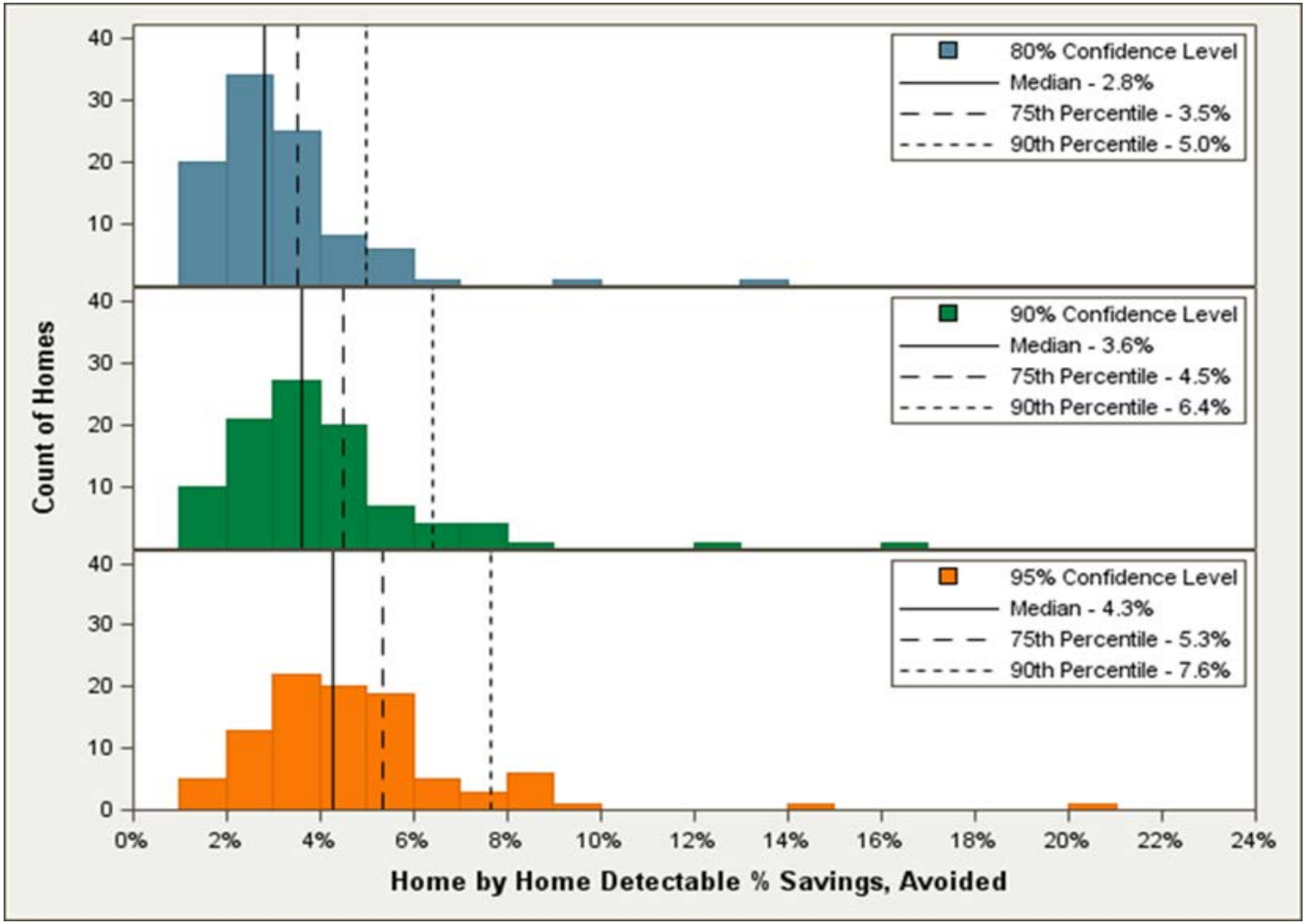
Detectable Percent Savings for Hourly and Daily Models

- At 90% Confidence Level



Detectable Percent Savings at Varying Confidence Levels

- Using Hourly Models



Impact of Part-Year Modeling and Seasonality

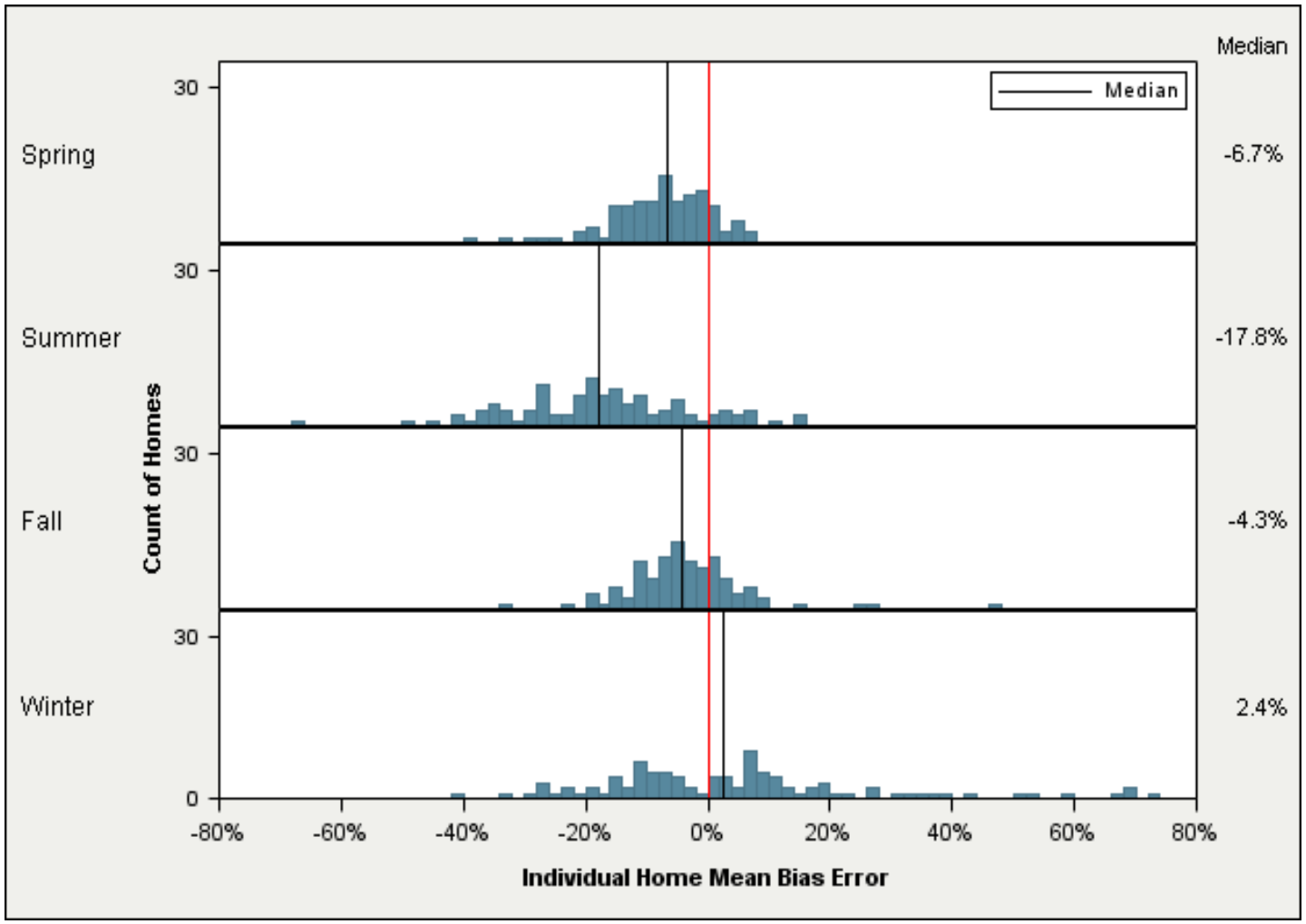
- The ability to develop an accurate regression using less than a year of interval data offers potential benefits over established M&V approaches that use monthly data and require a full year of data.
- Such an approach could reduce:
  - The delay for a utility to claim savings for a project
  - The delay for an owner to receive incentives (if dependent on measured savings)
  - The risk that other activities or projects affect energy consumption and interfere with M&V for the initial project

Using MBE to Gauge Part-year Analysis

- MBE is the more salient metric to examine for the part-year analysis, to determine the amount of bias introduced into the results by shortening the monitoring period
- Models created with three, six, and nine months of data

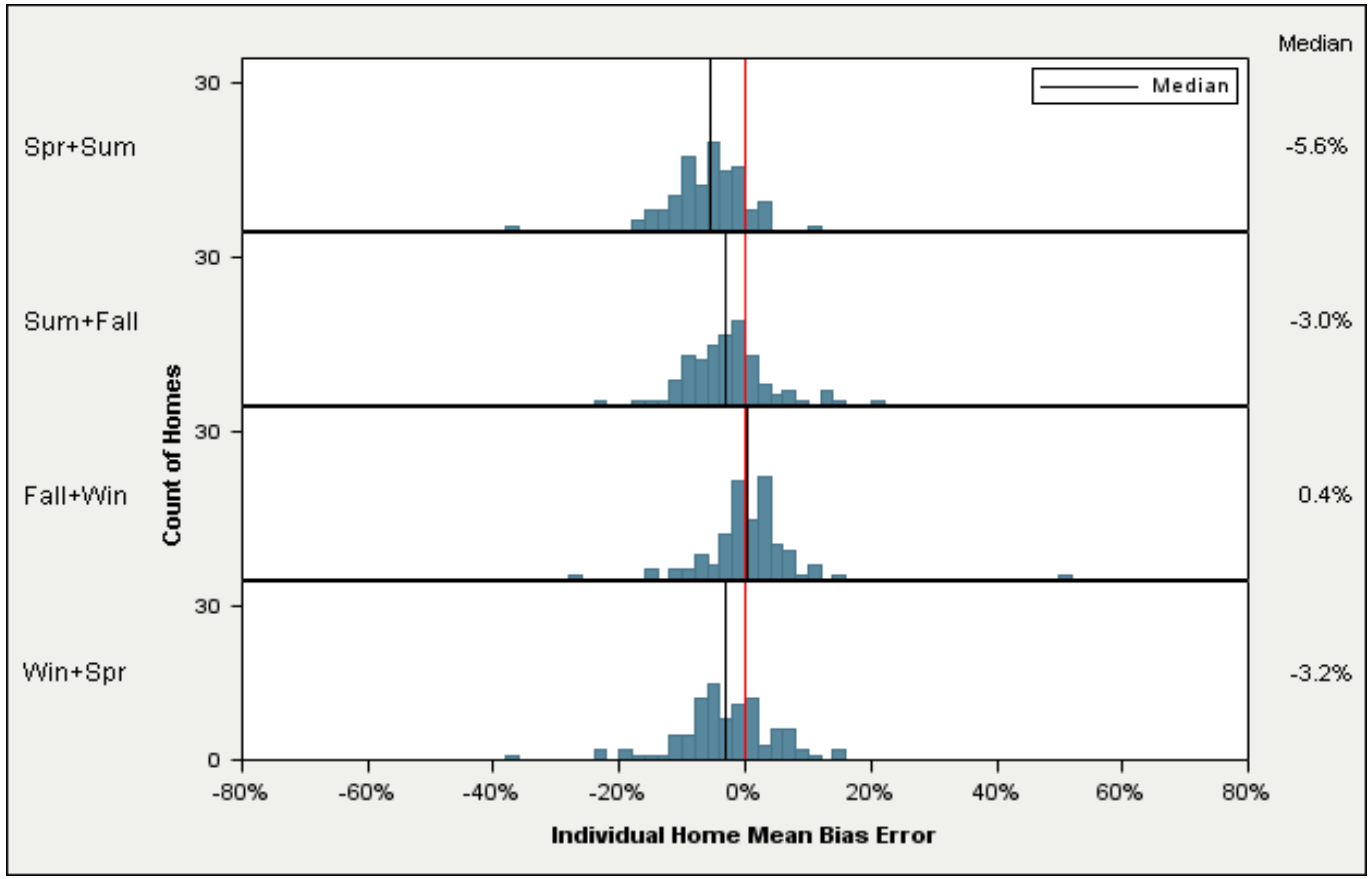
Three-month Model

- Median MBEs are far from zero



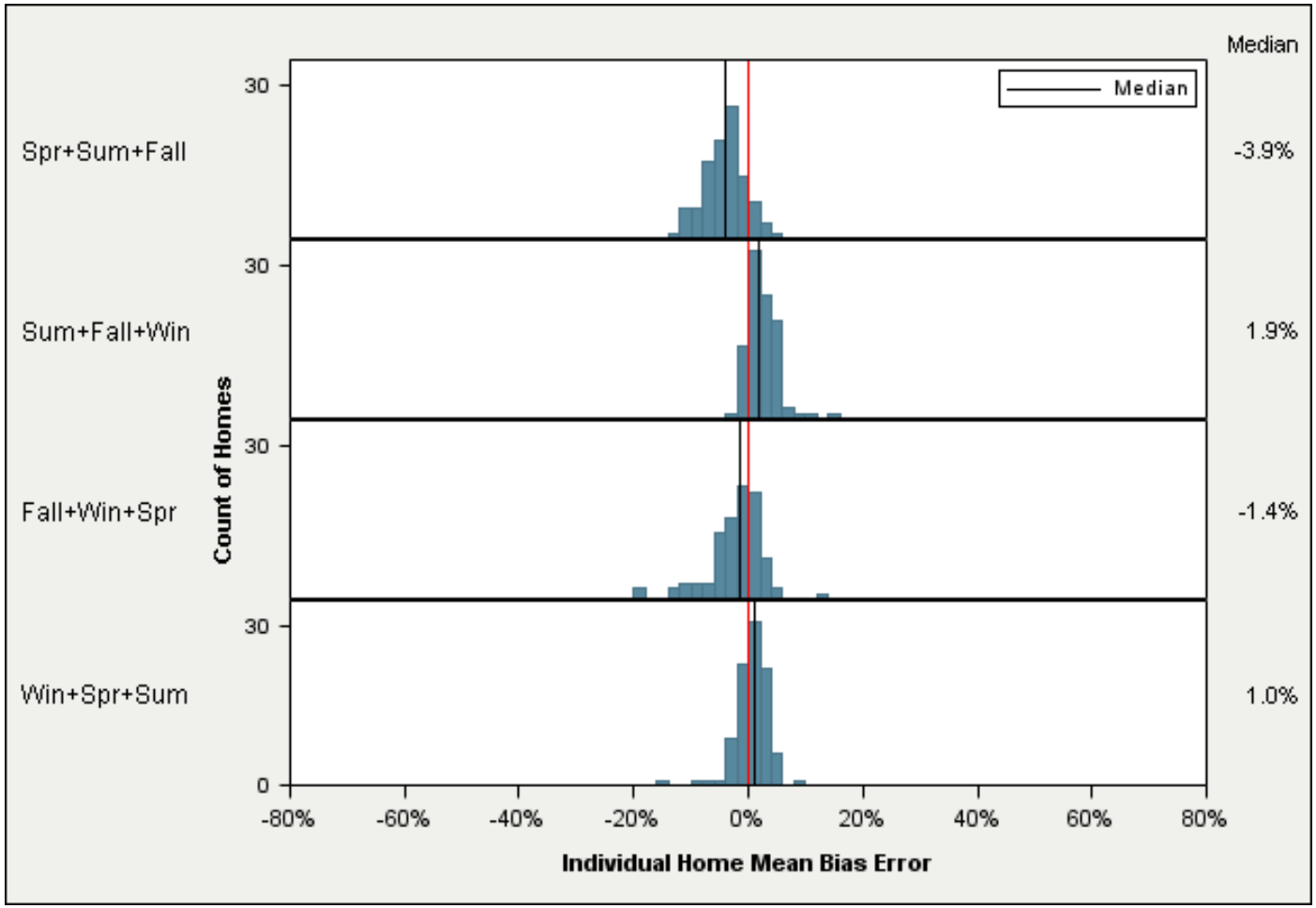
Six-month Model

- Improved median MBE may suffice to claim savings in certain types of programs



Nine-month Model

- Median MBE is close to zero and could be used to claim annualized savings above 4%



Pooled Data Analysis

- Extra bonus topic covered in the Report, To Be Published on May 11!

Conclusions and Recommendations

Conclusions

- Higher confidence level means that higher project savings are needed in order to use an individual home regression approach
- M&V using interval data could have applications for a range of program types, including those with relatively low savings (such as BBEE)
- Using anything less than six months of data results in unacceptably high MBEs

Recommendations

- Conduct further analysis with more data!
  - Use second-year data from same data set
  - **Apply the modeling approach to a set of homes with measures installed using pre- and post-implementation interval data**
  - Further explore seasonal impacts and other key-factors affecting part-year regression modeling
- Gather information on stakeholder needs and requirements for an automated M&V solution using interval data

- Emily Kemper, AIA
- Senior Engineering Manager
- Emily.Kemper@clearesult.com
- 513.807.0887

Thank you!

DISCUSSION QUESTIONS

- What are the stakeholder needs for automated M&V for homes?
- What other challenges remain in the evaluation realm?

COFFEE BREAK

- Reconvene at 3:10
- Don’t forget to fill out index cards with your questions for the HEMS Vendor Lightning Round!

Policy Opportunities

Kara Saul-Rinaldi
The Home Performance Coalition

Home Performance Coalition

HEMS Workshop

HPC Annual Conference
New Orleans, LA
May 3, 2015

Kara Saul Rinaldi
Vice President of Government Affairs and Policy
Home Performance Coalition

THE HOME PERFORMANCE COALITION

- National, non-profit, 501c3 organization
- Supports whole-house upgrade programs through research and convening projects
- Addresses challenges and barriers through research and policy projects
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    - Cost-effectiveness testing
    - Weatherization and Home Performance

SMART GRID AND HOME PERFORMANCE

Making Sense of the Smart Home

Applications of Smart Grid and Smart Home Technologies for the Home Performance Industry

http://www.homeperformance.org/policy-research/resources/reports

FEDERAL POLICY AND TECHNOLOGY

The backbone for industry success/scale is getting stronger:

- Great companies marketing, selling, performing building performance projects
- Lots of best business practices developing and spreading
- Industry systems coming online: HPXML/Green Button, software, scores/ratings, and much more.
- More people trained to install building performance upgrades
- Forward-looking work on quantifying measured energy savings – to better enable industry innovation and scale.

NATIONAL LEGISLATION POLICY INNOVATION

- **Energy Efficiency and Industrial Competitiveness Act - S.720** AKA "Portman-Shaheen"
  - ***Included:*** **SAVE Act (*113th*)** *The Sensible Accounting to Value Energy (SAVE) Act (S. 1106), introduced by Sens Bennet (D-CO) and Johnny Isakson (R-GA)*

- **Residential Energy Efficiency Pay for Performance Pilot**
  - To establish state pilot programs that can produce measured energy savings in a standardized manner. These state pilot programs, will utilize federal resources to provide payment to companies based on measured energy savings from residential retrofits.

- **Ensuring Access to Utility Data – E-Access**
  - S. 1044 – (Markey D-MA)
  - H.1980 (Welch D-VT)

- ***Funding for Home Energy Upgrades***
  - *The Home Owner Managing Energy Savings (HOMES) Act (HR 2194), introduced in by Reps. McKinley (R-WV) and Welch (D-VT).*

ENERGY POLICY EMERGING TREND: *DATA AND INTELLIGENCE*

- S. 523 – Energy Retrofitting Assistance to Schools (Collins)
- S. 600 – Energy Efficiency Retrofit Pilot Program (Kolbuchar)
- S. 703 – Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (Coons)
- S. 723 – Utility Energy Service Contracts Improvement Act (Schatz)
- S. 858 – Energy Savings Through Public-Private Partnerships Act of 2015 (Gardner)
- S. 878 – Residential Energy Savings Act (RESA – Sanders)
- S. 886 – Smart Energy and Water Efficiency Act of 2015 (Udall)
- S. 888 – The Prepare Act (Schatz)
- S. 893 –Energy Productivity Innovation Challenge Act of 2015 (EPIC) (Warner)
- S. 1038 – Energy Star Integrity Act (Risch)
- S. 1046 – Smart Buildings Acceleration Act (Cantwell)
- S. 1052 – Benchmarking (Franken)
- S. 1054 – Smart Manufacturing Leadership Act (Shaheen)

WHITE HOUSE

- **Green Button/Data Access**
  - The Administration must revitalize its efforts to advance not only Green Button but more importantly Green Button Connect, currently only offered by Pepco in the mid-Atlantic and two California utilities but needed by consumers across the country. The Department of Energy has recently released protocols for sharing utility data.

- **EM&V Protocols**
  - UMP and IPMVP are an excellent start but not the final work on EM&V for home performance, particularly if the use of home energy management systems is included. In addition, EM&V that has the precision that is needed for EPA to ensure that home performance can be included in SIPs needs additional attention.

CLEAN POWER PLAN

- Clean Air Act 111(d)
- Flexibility request: a pathway to include both utility and non-utility delivered efficiency
- Energy Efficiency one of the BSER
- Unclear: Compliance plan use of residential energy efficiency and HEMS technology

Thank you!

Home Performance Coalition

Kara Saul-Rinaldi
Vice President of Government Affairs and Policy
ksaul-rinaldi@homeperformance.org

202.276.1773

Northeast Energy Efficiency Partnerships

HEMS Vendor Lightning Round!

THE RULES ARE SIMPLE

- Each company will be given the same amount of time to answer the same question posed by the audience
- When the timer goes off, you are done!
- Will rotate the order for speakers
- Any questions before we begin?

- On the hot seat:
  - EnergySavvy
  - Nest
  - Weatherbug

Northeast Energy Efficiency Partnerships

...and Customer Engagement

Sean Bleything

Vermont Energy Investment Corporation


Vermont
Energy Investment
Corporation

2015 ACI
HEM's Workshop

May 4, 2015

Sean Bleything
Senior Consultant
Vermont Energy Investment Corporation

Vermont Energy Investment Corporation

Vermont
Energy Investment
Corporation

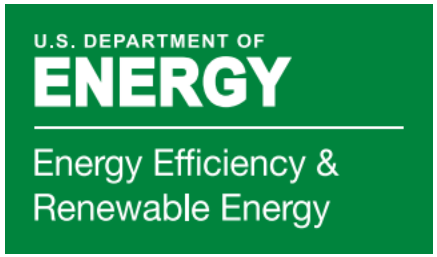
Consumer Behavior Study – VEC-Efficiency Vermont

Partnership with Vermont Electric Cooperative (VEC) and Efficiency Vermont

- Part of $159 Million Smart Grid Investment Grant (SGIG)
- Resulting in Vermont as first state with nearly 100% AMI
- 1 of 9 SGIG Consumer Behavior Studies in the nation
- Participants randomly selected from rural coop
- Range of income levels

Consumer Behavior Study – WIPP

Weatherization Innovation Pilot Program (WIPP)



- 1 of 16 nationwide
- Collaboration with Central Vermont Office of Economic Opportunity and State of Vermont
- Participants low income WAP and LIHEAP customers
- Geographically dispersed
- Serviced by multiple utilities

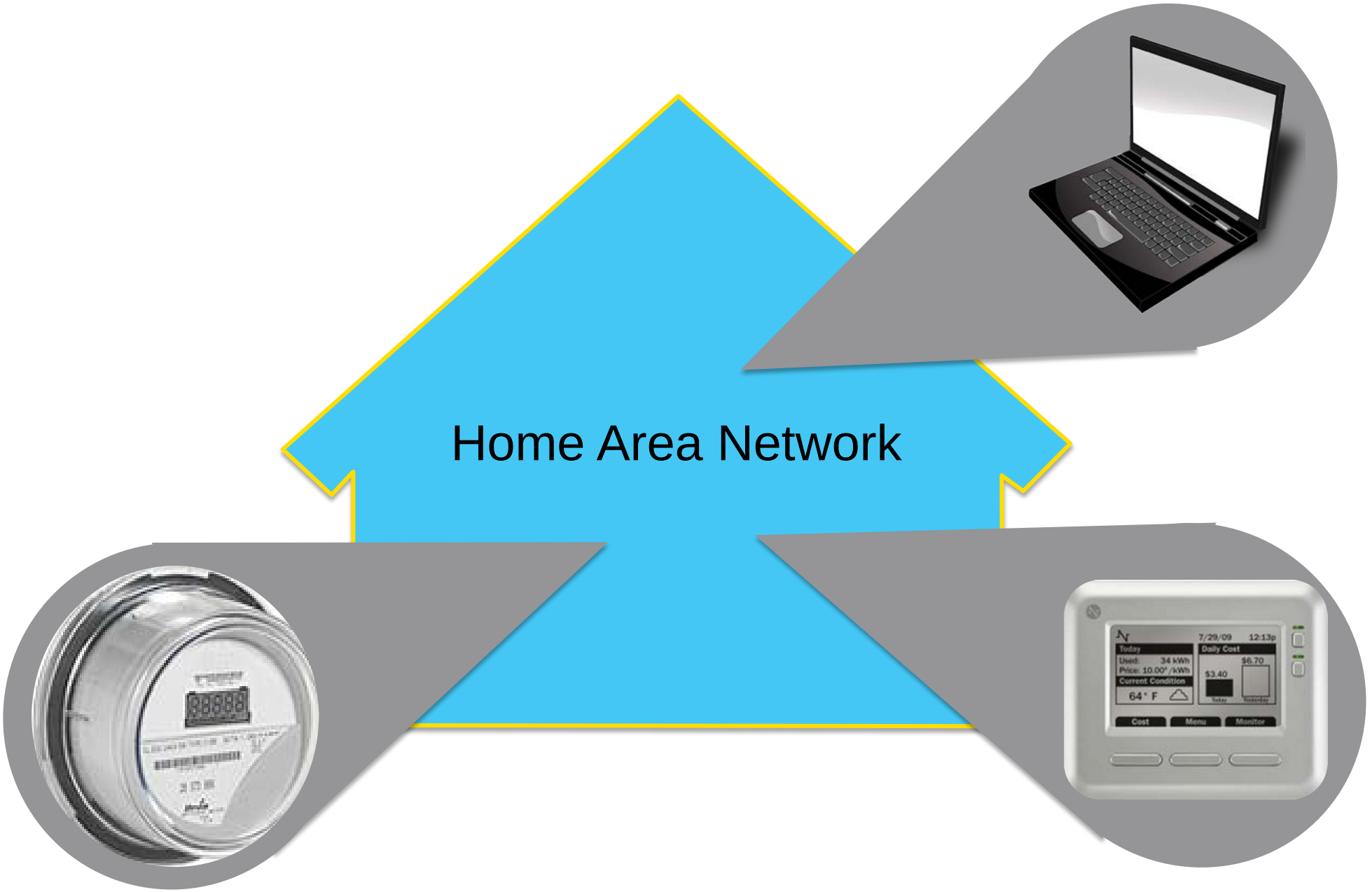
VEC-Efficiency Vermont & WIPP Pilot Projects

Smart Grid Pilots	**VEC – 1**		**VEC – 2**	**WIPP**	
Timeframe	1 Year		1 Year	1 Year	
Group #	1	2 & 3	1	1	2
Phone Efficiency Coach	X	X			X
Field Efficiency Coach				X	
In-Home Display		X		X	X
Personal Web Portal	X	X	X	X	X
Variable Peak Pricing			X		

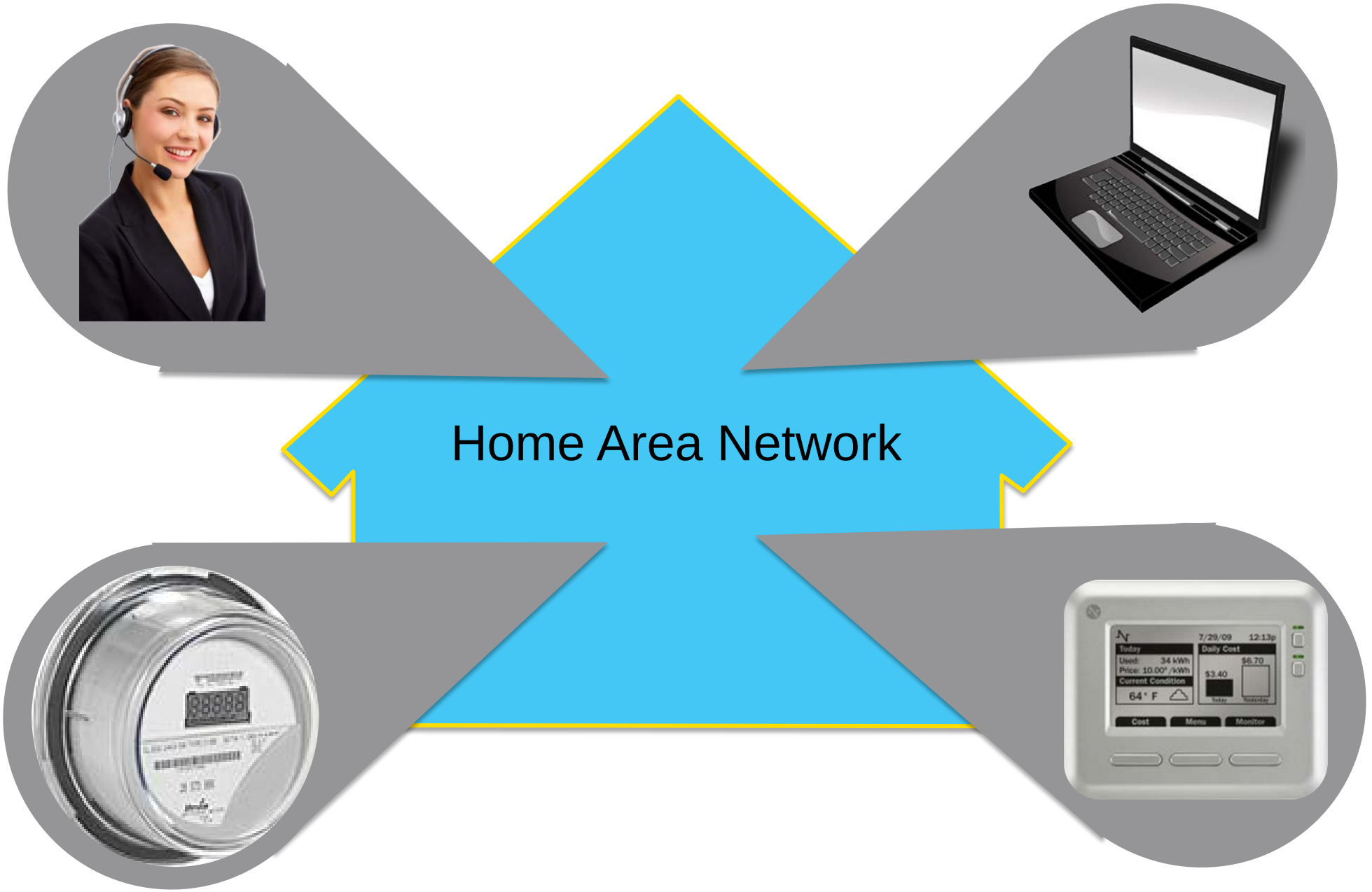

Technology
Treatments


Real-time energy
information to
customers

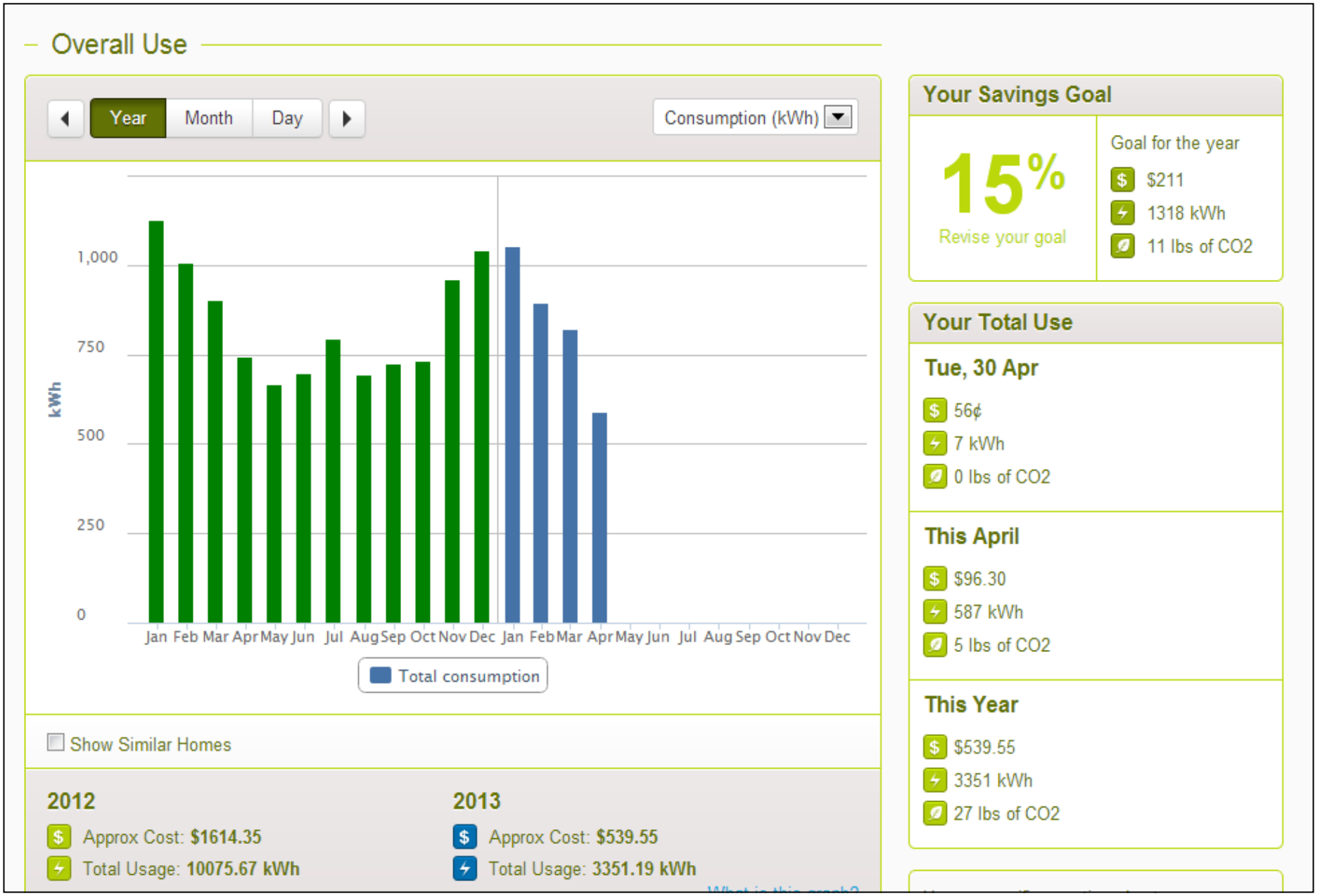
Consumer Behavior Study Components



Consumer Behavior Study Components



Web Portal - Energize

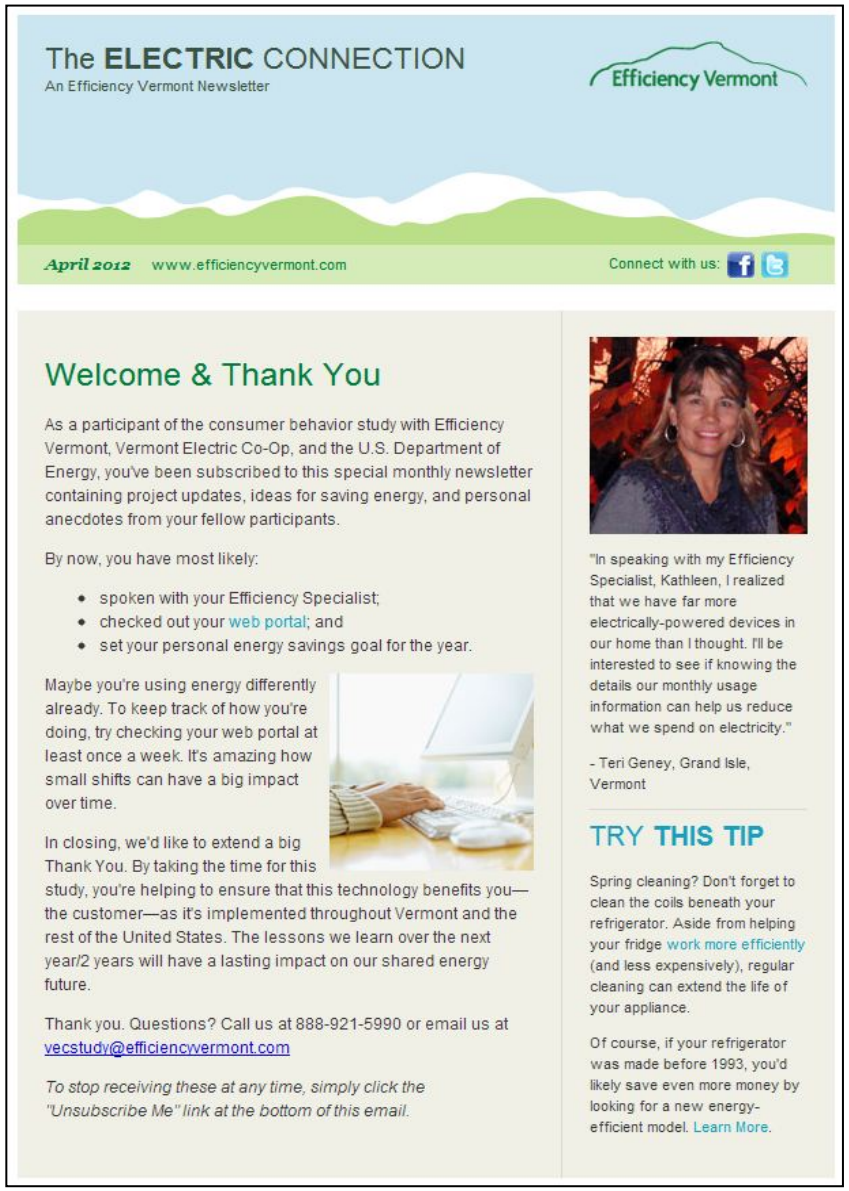


Proactive Customer Service

Customer outreach to educate and motivate

Vermont Energy Investment Corporation

Proactive Customer Service



The **ELECTRIC** CONNECTION
An Efficiency Vermont Newsletter

Efficiency Vermont

April 2012 www.efficiencyvermont.com Connect with us:

Welcome & Thank You

As a participant of the consumer behavior study with Efficiency Vermont, Vermont Electric Co-Op, and the U.S. Department of Energy, you've been subscribed to this special monthly newsletter containing project updates, ideas for saving energy, and personal anecdotes from your fellow participants.

By now, you have most likely:

- spoken with your Efficiency Specialist;
- checked out your web portal; and
- set your personal energy savings goal for the year.

Maybe you're using energy differently already. To keep track of how you're doing, try checking your web portal at least once a week. It's amazing how small shifts can have a big impact over time.

In closing, we'd like to extend a big Thank You. By taking the time for this study, you're helping to ensure that this technology benefits you—the customer—as it's implemented throughout Vermont and the rest of the United States. The lessons we learn over the next year/2 years will have a lasting impact on our shared energy future.

Thank you. Questions? Call us at 888-921-5990 or email us at vecstudy@efficiencyvermont.com

To stop receiving these at any time, simply click the "Unsubscribe Me" link at the bottom of this email.

"In speaking with my Efficiency Specialist, Kathleen, I realized that we have far more electrically-powered devices in our home than I thought. I'll be interested to see if knowing the details our monthly usage information can help us reduce what we spend on electricity."

- Teri Geney, Grand Isle, Vermont

TRY THIS TIP

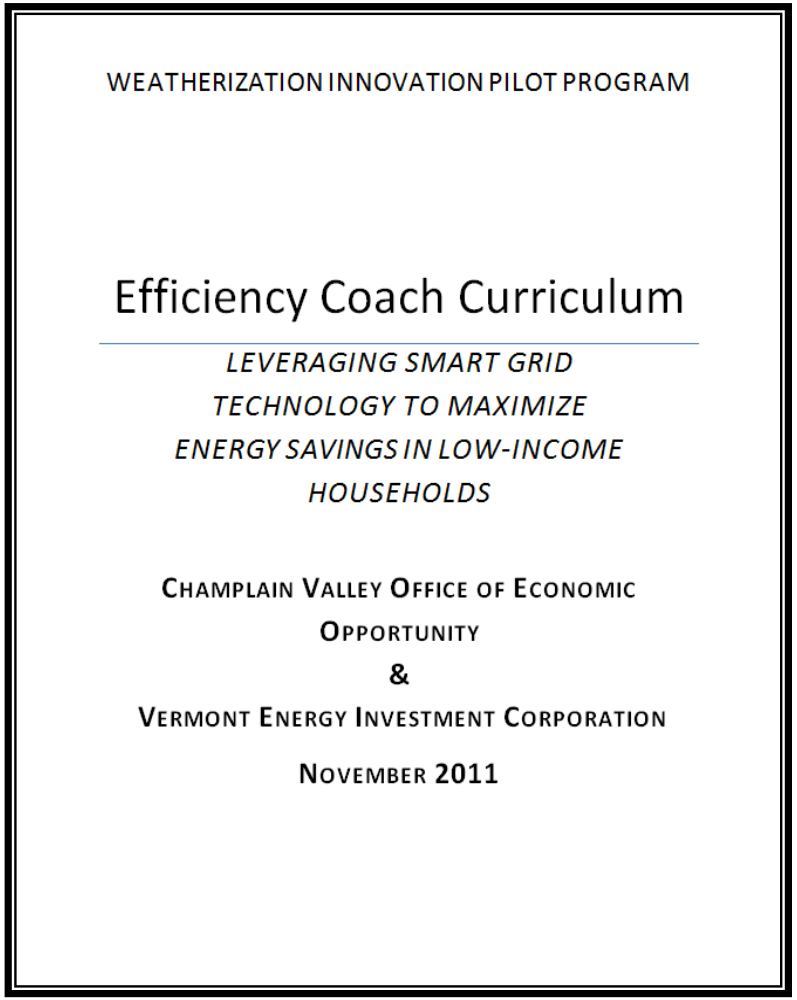
Spring cleaning? Don't forget to clean the coils beneath your refrigerator. Aside from helping your fridge work more efficiently (and less expensively), regular cleaning can extend the life of your appliance.

Of course, if your refrigerator was made before 1993, you'd likely save even more money by looking for a new energy-efficient model. Learn More.

- Telephone
  - Up to 6 outgoing phone calls
  - Ongoing support as needed
- Site Visits
  - 1-2 site visits over 12 months
  - 1-2 follow-up phone calls
  - Ongoing support as needed
- eNewsletter & Email Support
- Outreach timed with deployment

Proactive Customer Service (PCS)

- Introductions
- Review device and portal operation
- Set goals for energy savings
- Deliver energy curriculum
  1. Furnace/boiler operation
  2. Furnace filters
  3. Thermostat setback
  4. Electric/Baseload use
  5. General energy tips
- Make recommendations
- Discuss opportunities and barriers



WEATHERIZATION INNOVATION PILOT PROGRAM

Efficiency Coach Curriculum

LEVERAGING SMART GRID TECHNOLOGY TO MAXIMIZE ENERGY SAVINGS IN LOW-INCOME HOUSEHOLDS

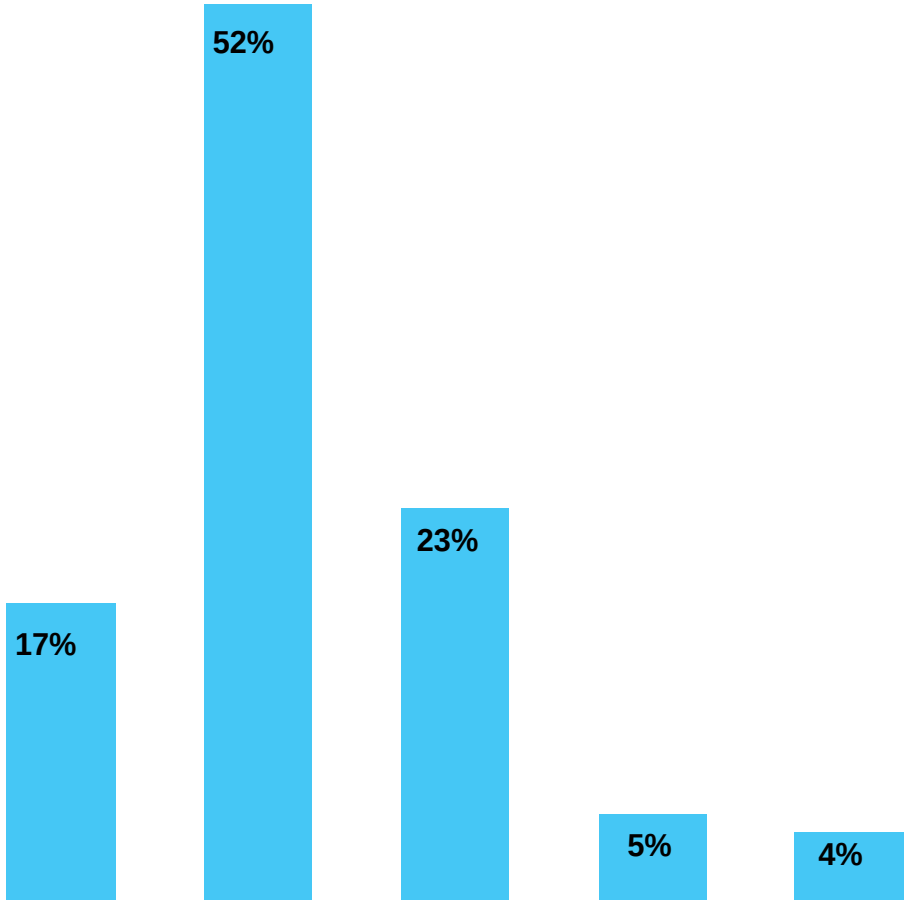
CHAMPLAIN VALLEY OFFICE OF ECONOMIC OPPORTUNITY

&

VERMONT ENERGY INVESTMENT CORPORATION

NOVEMBER 2011

Customer Reaction to PCS



Positive response to Efficiency Coaching

- 60% were motivated to save energy
- 58% says it has influenced their future appliance buying decisions

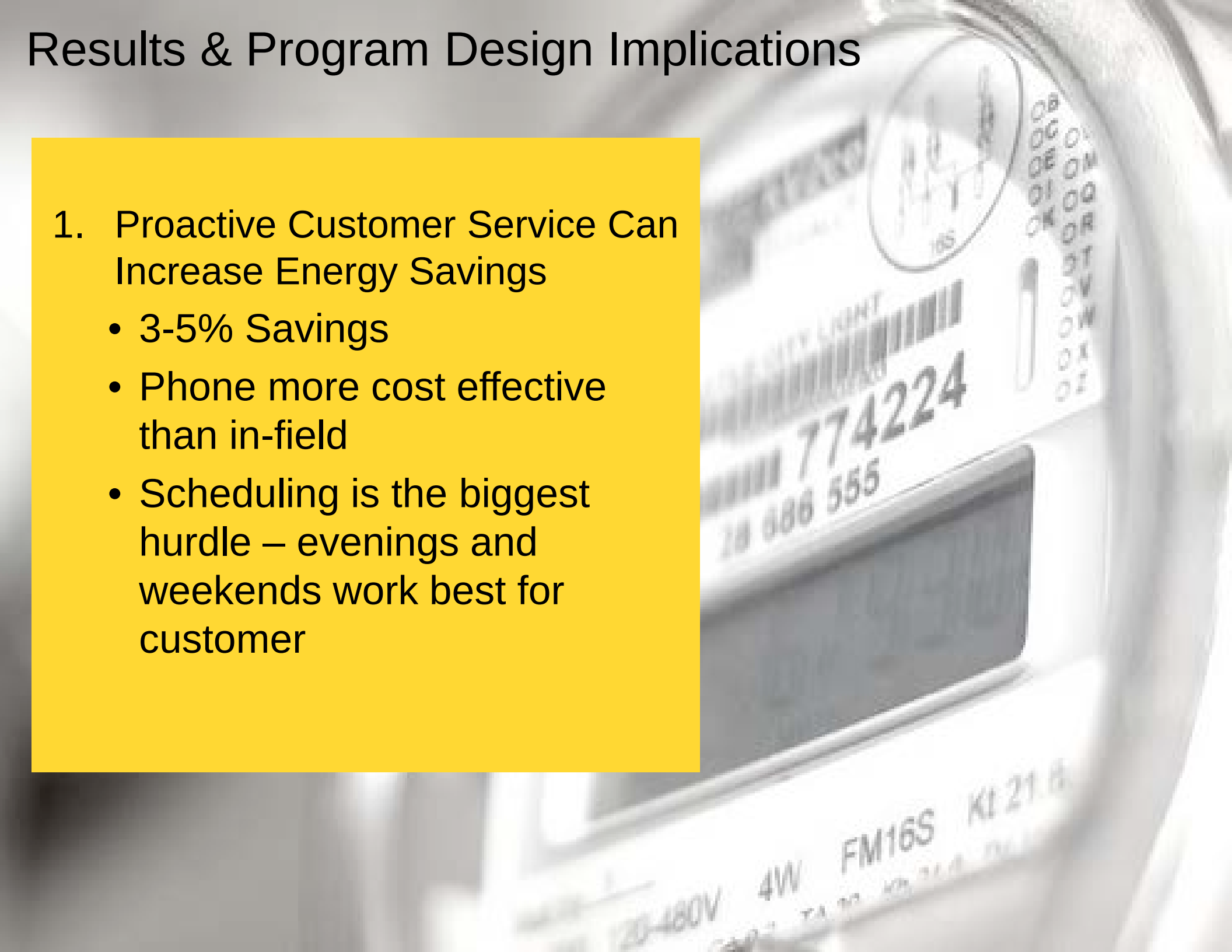
Results &
Lessons Learned

Program Design
Implications

Vermont
Energy Investment
Corporation

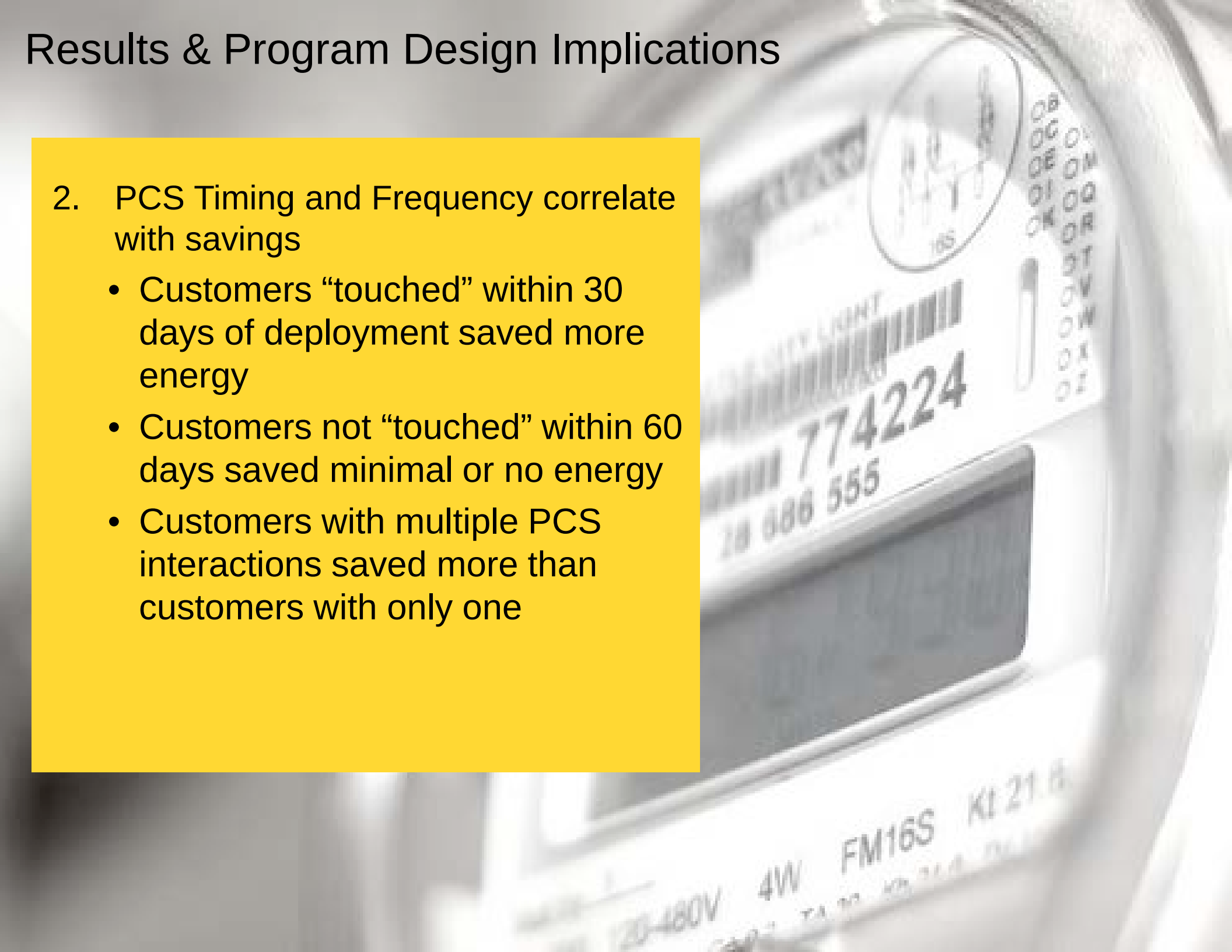
Results & Program Design Implications

1. Proactive Customer Service Can Increase Energy Savings
   - 3-5% Savings
   - Phone more cost effective than in-field
   - Scheduling is the biggest hurdle – evenings and weekends work best for customer



Results & Program Design Implications

2. PCS Timing and Frequency correlate with savings
   - Customers “touched” within 30 days of deployment saved more energy
   - Customers not “touched” within 60 days saved minimal or no energy
   - Customers with multiple PCS interactions saved more than customers with only one



Results & Program Design Implications

3. Customer Engagement can lead to additional savings opportunities
   - EE Product/Appliance buying confidence
   - Better understanding of energy use
   - Higher motivation to make energy conservation decisions

Human Change Requires a Human Touch

Sean Bleything
sbleything@veic.org
(802) 540-7930

Thank you!

Vermont Energy Investment Corporation


Learn more
at
www.veic.org

DISCUSSION QUESTIONS

- What can HEMS consumer engagement do for you?
- What are the major barriers for successful consumer engagement?
- What are your goals for consumer engagement?
- If the HEMS is saving, does the consumer engagement matter?

Northeast Energy Efficiency Partnerships

Discussion, Brainstorming, and Next Steps

Claire Miziolek, NEEP

Kara Saul-Rinaldi, HPC

DISCUSSION

- Biggest priorities
- Unresolved areas
- Terminology
- Further research
- Working Group priorities

EVALUATION SPEAKERS (WRITE IN)

- Claire
- Carlyn
- Emily
- Sean
- “Vendors”

BRAINSTORMING

NEXT STEPS

- HEMS Working Group, next meeting: **Thursday, May 14th at 12pm EST**
- NEEP Research Project: Heads up! We may be reaching out!
- Policy follow up:
  - Kara Ksaul-rinaldi@homeperformance.org
- Wednesday PM session, 111-d Tuesday
- Final thoughts from the group?

- Reminders:
  - Sign up for the HEMS Working Group
  - Slides and follow-up to be sent to participants

HAPPY HOUR – ADVANCING TECHNOLOGY STANDARDS TO ACCELERATE THE MARKET

- Join us for reception from 5:30-7:00
  - Imperial 5 AB
- Happy Hour Sponsors: EnergySavvy, PSD Consulting, Building Performance Institute
- Happy Hour Hosts: Home Performance Coalition, True Energy Solutions, Northeast Energy Efficiency Partnerships
- Discussions of:
  - Standards on Data Interchange
  - Driving Standard Adoption
  - Savings Quantification Standards

Thank you!

Claire Miziolek
cmiziolek@neep.org
781-860-9177 x 115

Kara Saul-Rinaldi
ksaul-rinaldi@homeperformance.org
202.276.1773

Have a great day!