

Better Buildings Residential Network Peer Exchange Call Series: Fostering Behavior Change in the Energy Efficiency Market

Call Slides and Discussion Summary

March 26, 2015



Agenda

- Call Logistics and Opening Poll
- Residential Network and Peer Exchange Call Overview
- Featured Speakers
 - Tom Syring, Senior Research Analyst, Franklin Energy Services
 - Cynthia M. Trottier, Senior Analyst Energy Efficiency, Eversource
 - Anne Dougherty, Founding Advisor, Illume Advising

Discussion

- How is your organization using behavior change strategies to generate demand for energy efficiency upgrades?
- What are some challenges or lessons learned from implementing behavior based strategies?
- How can you measure the impacts of behavior-based efforts?
- Other questions/issues related to the topic?
- Closing Poll





Call Participants

- Boulder County
- California Housing Partnership
- Center for Sustainable Energy
- City of Anacortes
- City of Aspen
- City of Bellevue
- City of Bloomington
- City of Columbia
- City of Sunnyvale
- City of Takoma Park
- Civic Works
- Clean Energy Durham
- CLEAResult
- ComEd
- Cambridge Community
 Development Department
- Colorado Office for Resource Efficiency
- County of Santa Barbara

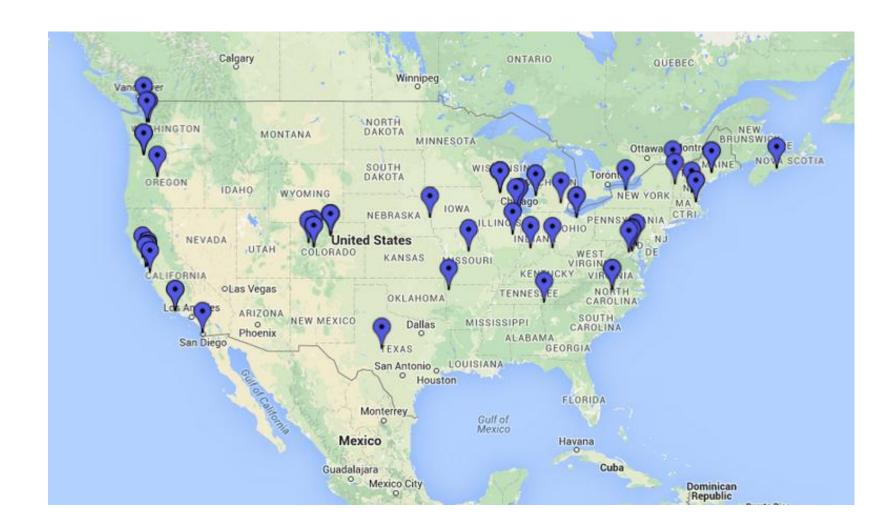
- County of Sonoma
 - Dr. Energy Saver
- Duke Carbon Offsets InitiativeEagle County Government
- Efficiency Maine
- EfficiencyOne
- Elevate Energy
- emPower Central Coast
- Energy Efficiency Specialists, LLC
- Eversource
- Franklin Energy Services
- Greater Cincinnati Energy Alliance
- green|spaces
- Holland board of Public Works
- Holy Cross Energy
- Honeywell
- Illume Advising

- Massachusetts Department of Energy Resources
- MPower Oregon
- NeighborWorks of Western Vermont
- Simple Energy
- South Burlington Energy Committee
- StopWaste
- The Environmental Center
- The Oberlin Project
- TRC Solutions
- University of Nebraska, Omaha
- University of Illinois
- UtilityExchange.org
- Wisconsin Energy
 Conservation Corporation





Call Participant Locations







Opening Poll Results

- Which of the following best describes your organization's experience with the topic of behavior change strategies?
 - Some experience/familiarity: 51%
 - Limited experience/familiarity: 28%
 - Very experienced/familiar: 21%
 - No experience/familiarity: 0%
 - Not applicable 0% (please expand):



Better Buildings Residential Network

- Better Buildings Residential Network: Connects energy efficiency programs and partners to share best practices to increase the number of American homes that are energy efficient.
 - Membership: Open to organizations committed to accelerating the pace of existing residential upgrades. Commit to providing DOE with annual number of residential upgrades, and information about benefits associated with them.
 - Benefits:
 - Peer Exchange Calls
 - Tools, templates, & resources
 - Newsletter updates on trends
- Recognition: Media, materials
- Optional benchmarking
- Residential Solution Center

For more information & to join, email bbresidentialnetwork@ee.doe.gov.

- Better Buildings Residential Network Group on Home Energy Pros
 - Join to access:
 - Peer exchange call summaries and calendar
 - Discussion threads with energy efficiency programs and partners
 - Resources and documents for energy efficiency programs and partners

http://homeenergypros.lbl.gov/group/better-buildings-residential-network





Better Buildings Residential Network Group on Home Energy Pros Website





Peer Exchange Call Series

- Calls are held the 2nd and 4th Thursday of every month at 12:30 and 3:00 ET
- Calls cover a range of topics, including financing & revenue, data & evaluation, business partners, multifamily housing, and marketing & outreach for all stages of program development and implementation
- Upcoming calls:
 - April 9, 12:30 ET : Residential Energy Efficiency Messaging
 - April 9, 3:00 ET: The Future is Here: Smart Home Technology
 - April 23, 12:30 ET: Community Organizing and Outreach
 - April 23, 3:00 ET: Developing State Energy Efficiency Alliances
- Send call topic ideas to <u>peerexchange@rossstrategic.com</u>.





Peer Exchange Call Summaries

Discussion: Challenges and Solutions: Overcoming Challenges - Solutions: Access trusted, local messengers Engage your satisfied customers as champions to turn them into "lifetime customers" Invite people to make a pledge with a few simple EE activities they can take Connect with the right local partners (Connecticut conducted "community asset mapping") Directly involve the homeowner through DIY work or as energy efficiency demonstration homes to help them feel engaged (San Diego demonstration homes) Minimize paperwork to make it easier to participate

Participant Poll: Which of the following best describes your program's experience with energy efficiency behavior change efforts? Currently implementing: 31% Planning to implement: 31% Thinking about it: 19% Haven't thought about it: 0% Not applicable: 19%



How do you eat an elephant? One bite at a time. A slight shift in perspective goes a long way.

Understanding how EE can solve a financial, public relation, or customer service problem for the utility is the right place to start.





Residential Program Solution Center

Web portal of residential EE upgrade program resources, & lessons learned to plan better, avoid reinventing the wheel.

- BB Neighborhood Program, Home Performance with ENERGY STAR Sponsors+
- Provides:
 - Step-by-step guidance
 - Examples
 - o Tools
 - Templates
 - Lessons learned
 - Best practices
 - Tips
- Continually add content to support residential EE upgrade programs member ideas wanted!



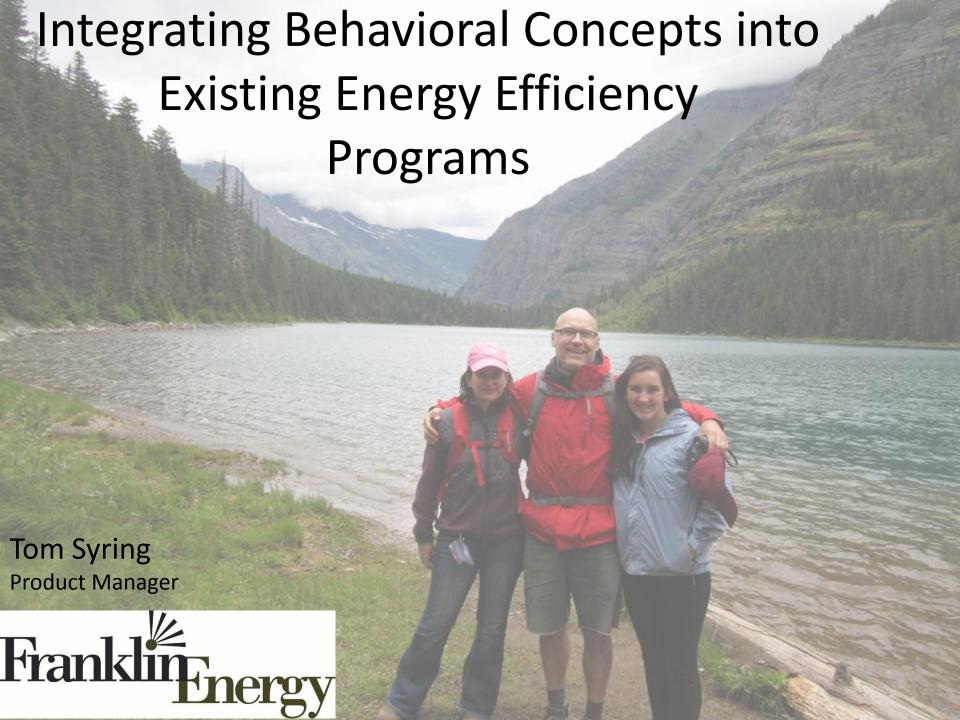
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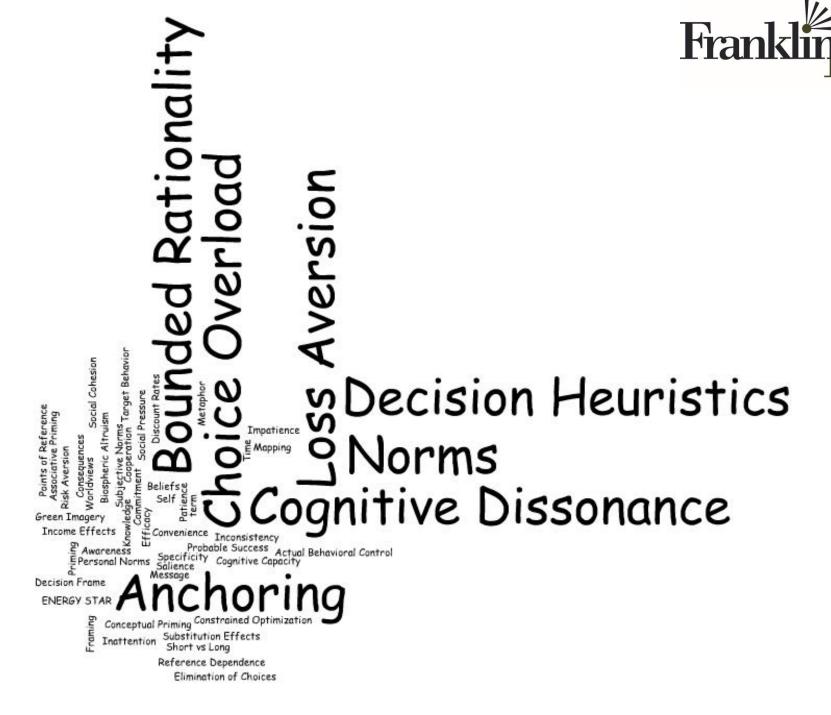




Example Strategies: Franklin Energy Services







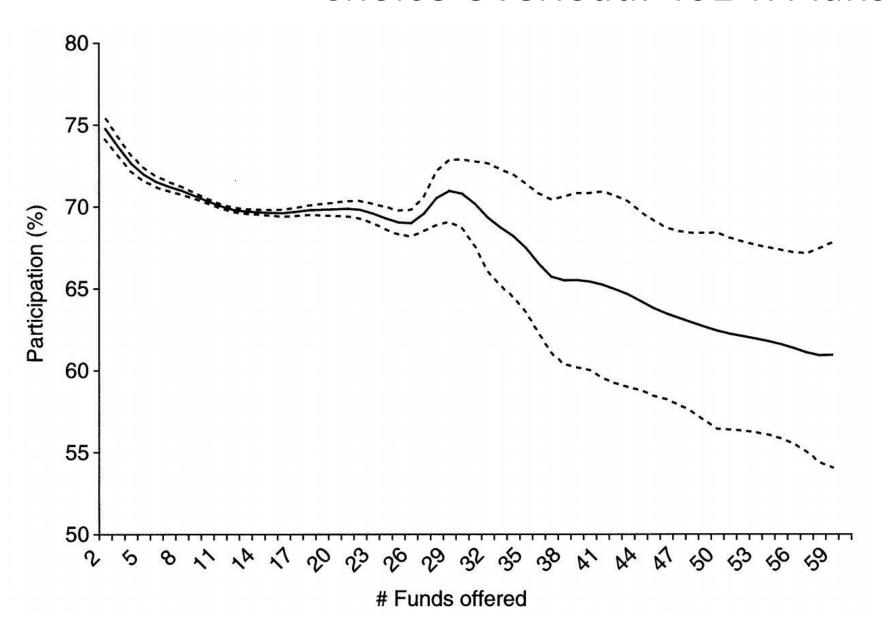




Choice Overload: Jam



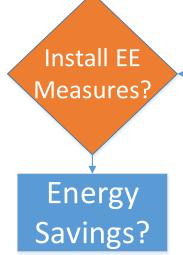
Choice Overload: 401-K Plans











Treatment:

Best
Options
Letter

Random Assignment

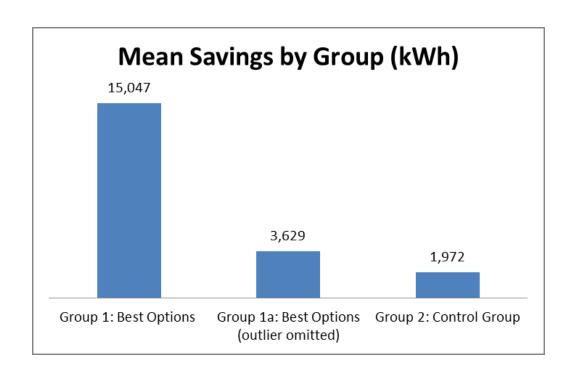


Control: Default Letter Install EE Measures?

Energy

Energy Savings?

Summary of Results			
	Group 1 (N=47)	Group 2 (N=40)	Group 1a (N=46)
Efficiency Measures Installed	17	9	16
Total kWh Savings	726,850	97,925	252,841
Mean Savings	15,047	1,972	3,629





Franklin Energy Services: Choice Overload Experiment

- In Energy Efficiency (EE) programs, home/building owners often confront Choice Overload: when people are presented with too many options, they choose nothing.
 - For example, the famous "Jam experiment" showed that a display of 24 jams only resulted in 2% of customers buying jam, as compared to a display of 6 jams, which resulted in a 12% purchase rate.
- Franklin Energy Services tested the Choice Overload hypothesis with business owners and energy reports:
 - Business calling to enroll in the EE programs were randomly assigned into a Treatment Group or Control Group.
 - The Treatment Group received the standard EE report with detailed recommendations embedded in the report, plus a cover letter detailing their "best option" for energy upgrades.
 - The Control Group only received the standard EE report with detailed recommendations embedded in the report.





Franklin Energy Services: Choice Overload Experiment Results

- Businesses assigned to the Treatment group, who received the "your best option is" cover letter, installed more measures and saved more energy than the Control group:
 - Treatment Group energy savings: 3,600 kWh/retrofit
 - Control Group energy savings: 1,972 kWh/retrofit
 - Note: due to the small sample size (~100 people) the results of this study are not statistically rigorous.
- Details of the "your best option is" cover letter:
 - Recommended measures were based on the shortest payback which produced more than 3% energy savings (savings calculations were based on the deemed savings).
 - A detailed report on the study, including example cover letters, is available on the <u>State of Minnesota Department of Commerce website</u>
- Suggestion for future research: determine percentage of program participants who are repeat customers.





Program Experience: Eversource





Broccoli or Ice Cream?

What Drives Energy Savings?

Cynthia M. Trottier Eversource





Home Energy Reports for Eversource NH?

Experience of other operating companies of Eversource

Other utilities in the country

Evaluation reports and residential behavioral studies

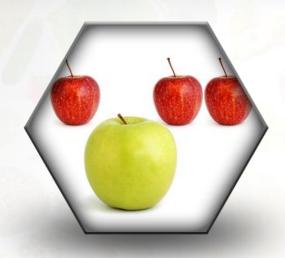
Neighbor comparison (normative)? √

Rewards? √

Now what?

Broccoli?





"Comparison is a thief of joy."

Theodore Roosevelt



Evergreen Katel 1000 Canscience Way Manchester, N.K 00001

Help Save Our Planet!

78% of guests who have stayed in this room, yes, your room, reuse their towels. If you want to do your share in saving our planet, please hang your towels for reuse.

The Giant Panda thanks you.



Ice Cream?



29



When no one's watching

"Always remember: If you're alone in the kitchen and you drop the lamb, you can always just pick it up. Who's going to know?"

- Julia Child







... now what?



- I love New York
- Virginia is for lovers





PSNH Test

50%

Comparison aka "intrinsic motivation"

Intrinsic motivation =

Interest in the behavior itself

Normative Home Energy Reports

Compare customers to similar homes to provide energy use context



Rewards aka "extrinsic motivation"

Extrinsic motivation =

Interest in the behavior does not exist without the reward

Rewards Home Energy Reports

Rewards for saving energy month-on-month over the previous year

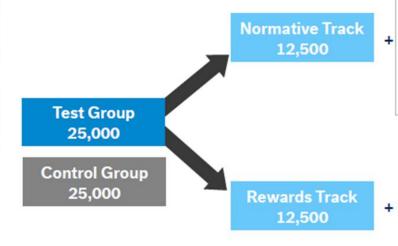
Customers received *only* rewards to isolate effect

Pilot Program Design

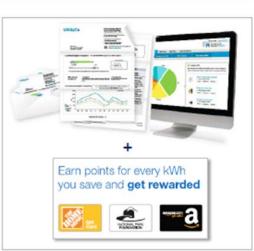


25,000 HH pilot, split into a normative track

and a rewards track

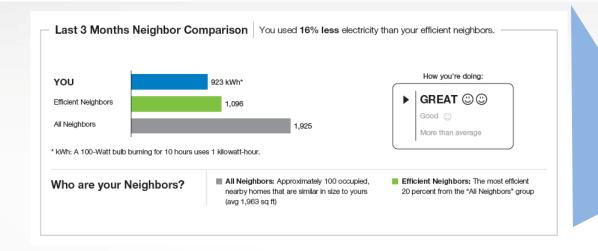


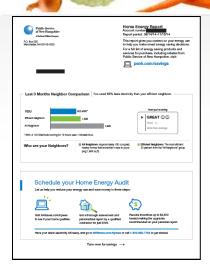
All results for both test groups will be evaluated against the control group. Results will be verified by an independent 3rd party.

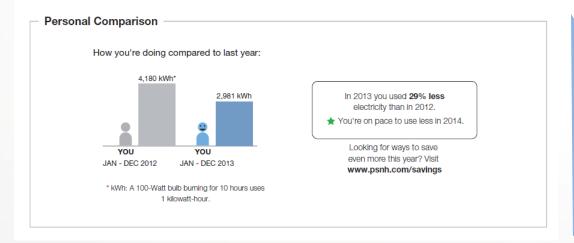


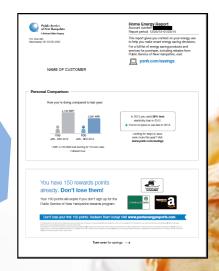


PSNH's Home Energy Report





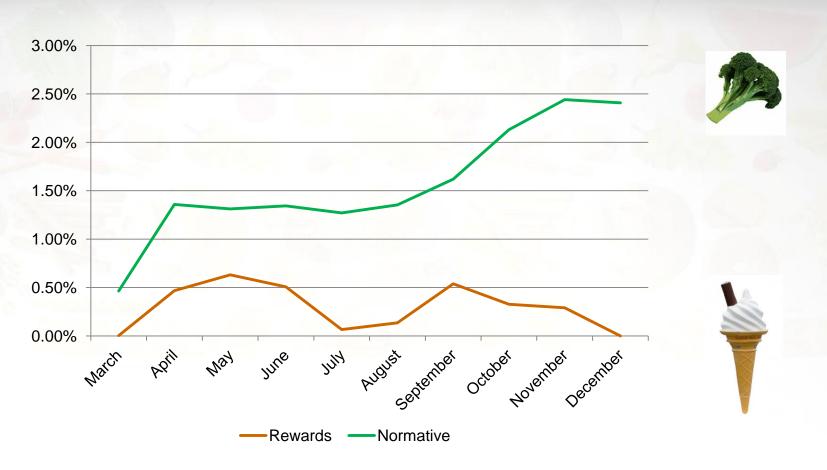






The Results





High-value, one-time action ...

You have 150 rewards points already. **Don't lose them!**

Your 150 points will expire if you don't sign up for the Public Service of New Hampshire rewards program.







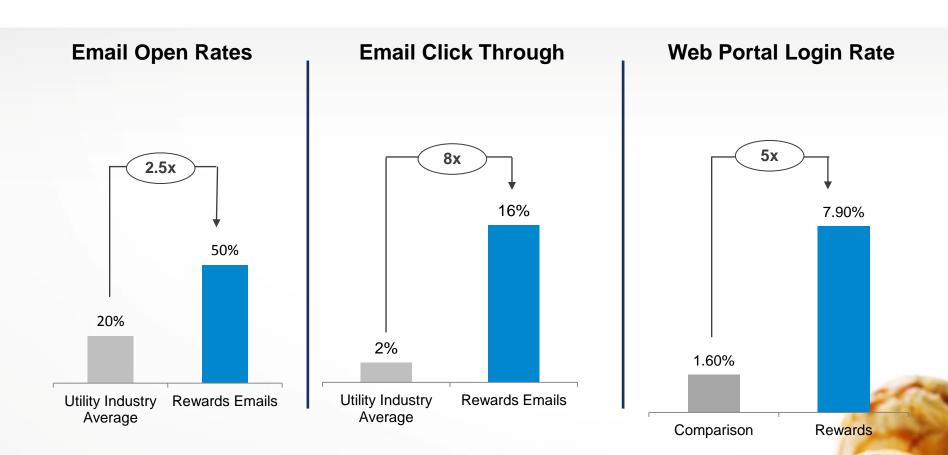
Don't lose your first 150 points: Redeem them today! Visit www.psnhenergyreports.com.

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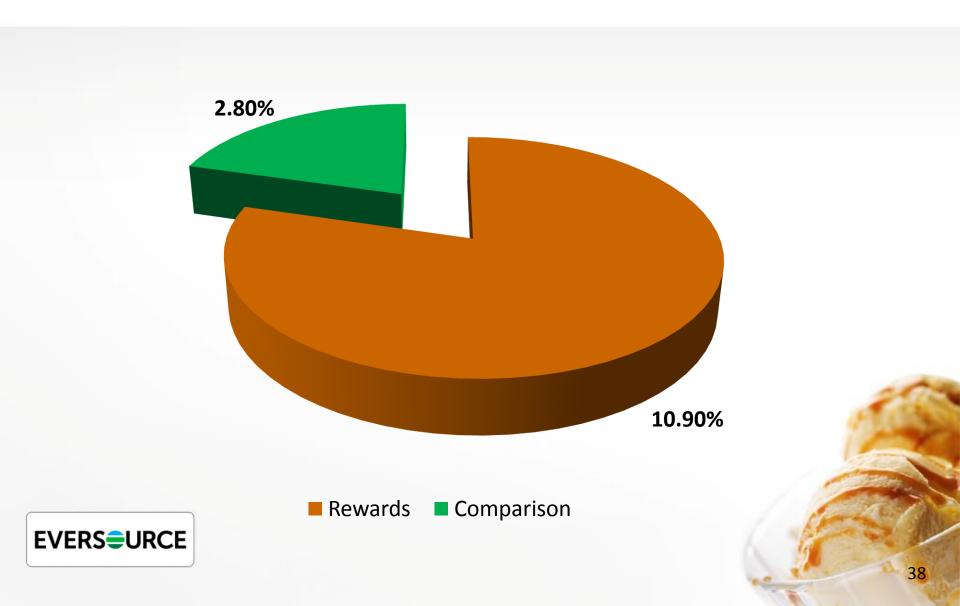


Great engagement...





How many created online accounts?



And yet ...



Rewards

Comparison

Avg. Time on Site (Rewards vs. Comparison)

2:15

4:14



So what drives energy savings?



- In the long run, neighbor comparison is a better motivator to save energy than rewards.
- However, rewards can drive engagement and high-value, one-time actions.
- Both work.
- ...and yes, there is broccoli-flavored ice cream.





Program Experience – Eversource: Comparison vs. Rewards marketing programs

- Eversource wanted to examine the effectiveness of Comparison vs. Rewards marketing in the context of energy efficiency:
 - Example of comparison marketing: "75% of hotel visitors reuse their towels"
 - Example of rewards marketing: Airline mileage plans
- In 2013 they coordinated with a utility-run energy efficiency program to study these marketing tools:
 - A group of program participants were compared to their neighbors and received rewards points accordingly. Points were reimbursable for gift cards to Amazon, Home Depot, Starbucks and Tango, as well as charitable institutions such as Habitat for Humanity and the National Parks Foundation.
 - A group of program participants received rewards points, but were only compared to themselves.
 - A third group only received rewards points, but were not compared to themselves or others.





Program Experience – Eversource: Comparison vs. Rewards Results

- Comparison work well for sustained energy savings, and in the end resulted in more energy savings (~2.5%).
 - People who received the rewards and comparative marketing materials spent more time on the website, and maintained a closer, more extended connection to the energy conservation community.
- Rewards worked well for high-value, one-time actions, and promoted open engagement, but resulted in less savings (~0.5%) than with the addition of comparison tactics:
 - People who received rewards only opened more emails, had more email click-throughs and web portal logins.
 - More of the rewards-only group created online accounts, but they did not spend as much time on the website.





Lessons Learned: Illume Advising

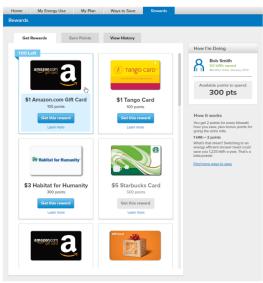


Savings at Scale: Effects from the first Statewide Behavioral Program

Anne Dougherty, ILLUME Advising, LLC Eileen Hannigan, ILLUME Advising, LLC

nationalgrid

national**grid**





Last Month Neighbor Comparison You used 40% MORE natural gas than your efficient neighbors.

YOU 49

All Neighbors 108

* Therms: Standard unit of measuring heat energy

* All Neighbors: Approximately 100 occupied, nearby homes (avg 0.20 mi away)

* Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group



Are we comparing you correctly? Tell us more about your home:

www.nationalgridus.com/energyreports







The program achieved electric savings

	Dual Fuel- Electric	Electric Only
Treatment Period		April 2013 - May 2014
First Report Date	2-Apr-13	2-Apr-13
Total Evaluated Participants	114,228	105,139
Baseline Usage (average daily kWh)	19.23	27.87
Net Savings (kWh per HH per day)	0.18	0.31
Net Program Savings from PPR (% per HH)	0.92%	1.10%
90% Confidence Interval Lower Bound	0.54%	0.75%
90% Confidence Interval Upper Bound	1.30%	1.45%
Incremental Savings from Other Programs (% per HH)	0.00%	0.06%
Final Adjusted Net Savings (% per HH)	0.92%	1.04%
Final Adjusted Net Savings (kWh per HH per day)	0.18	0.29
Total Adjusted Net Savings (kWH)	7,781,637	12,284,906

. . . and gas savings

	Dual Fuel - Gas	Gas Only
Treatment Period	Apr 2013 - May 2014	Sep 2013- May 2014
First Report Date	2-Apr-13	9-Sep-13
Total Evaluated Participants	114,228	16,191
Baseline Usage (average daily therms)	2.4115	3.3387
Net Savings (therms per HH per day)	0.0083	0.0224
Net Program Savings from PPR (% per HH)	0.34%	0.67%
90% Confidence Interval Lower Bound	0.12%	0.31%
90% Confidence Interval Upper Bound	0.56%	1.02%
Incremental Savings from Other Programs (% per HH)	0.00%	0.02%
Final Adjusted Net Savings (% per HH)	0.34%	0.66%
Final Adjusted Net Savings (therms per HH per day)	0.01	0.02
Total Adjusted Net Savings (therms)	359,233	84,031



Recommendations for future pilot testing

~.3% - 1% savings per household



2.35% gas savings in the heating season



1.35% annual electric savings via rewards





The thermostat pilot





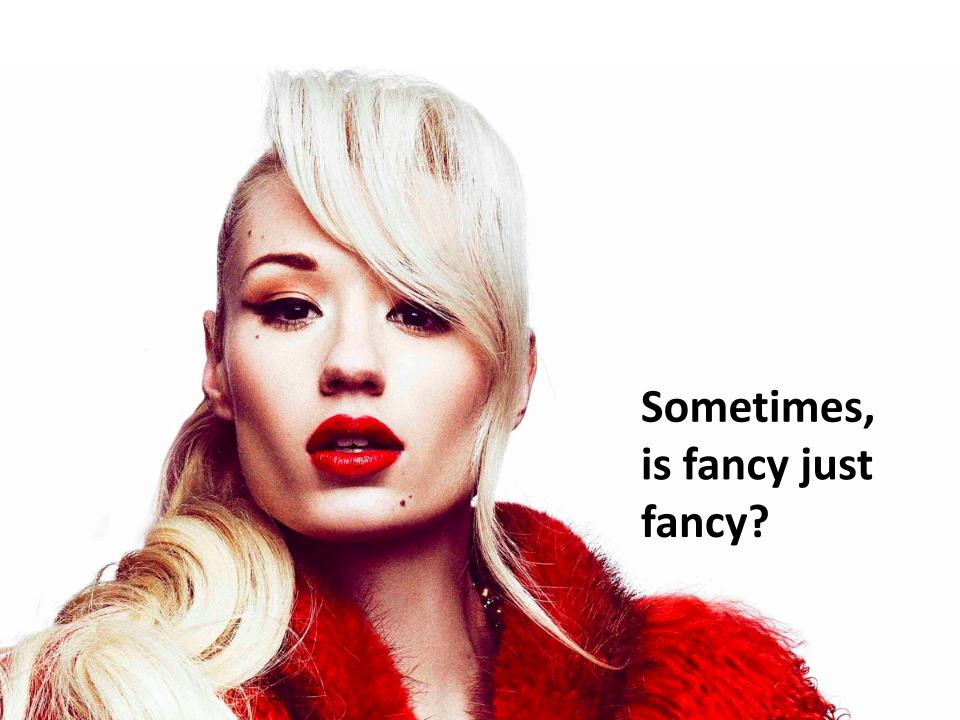
	Dual Fuel Electric Cooling Season	Dual Fuel Electric Non-Cooling Season
		Apr 2013 - May 2013
Treatment Period	June 2013 - August 2013	& Sep 2013 - May 2014
	<u> </u>	
Total Evaluated Participants	123	123
Baseline Usage (average daily kWh)	38.0214	24.1331
Incremental Net Savings (kWh per HH per day)	0.9411	0.0259
Incremental Net Program Savings from PPR (% per HH)	2.42%	0.11%
90% Confidence Interval Lower Bound	-0.60%	-2.89%
90% Confidence Interval Upper Bound	5.25%	2.93%
Total Savings (kWh)	10650	943

The thermostat pilot

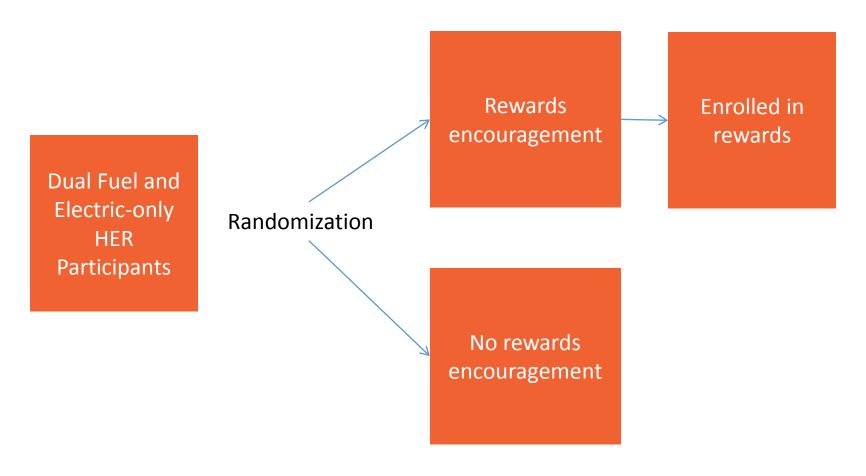




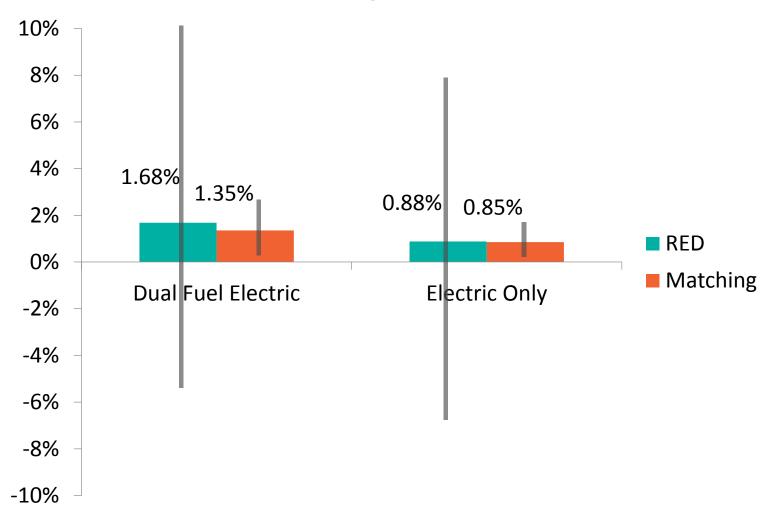
	Dual Fuel Gas Heating Season	Dual Fuel Gas Non- Heating Season
Treatment Period	Apr 2013 & Sep 2013 - Apr 2014	May 2013 - Aug 2013 & May 2014
Total Evaluated Participants	123	123
Baseline Usage (average daily therms)	3.7485	1.1005
Net Savings (therms)	0.0902	0.0237
Net Program Savings from PPR (% per HH)	2.35%	2.11%
90% Confidence Interval Lower Bound	0.62%	-1.04%
90% Confidence Interval Upper Bound	4.02%	5.06%
Total Savings (therms)	2662	430



Experimental design (Random Encouragement Design)



Comparing results across evaluation designs



What did we learn about implementing behavioral programs at scale?

- Relative and absolute savings per household may be lower when engaging mass market
- There are practical trade-offs between experimental and quasi-experimental design
- If establishing test groups, make sure you have the sample sizes (and power) to estimate savings
- Think about methods to strategically implement various program offerings

Illume Advising: Comparative Behavioral Marketing Tactics

- Illume Advising worked with National Grid out of Rhode Island to examine multiple marketing factors.
- The study examined how energy performance reports, smart thermostats and rewards points comparatively impact energy consumption. To do so, three groups of homeowners received different marketing tactics:
 - One group of homeowners received only the home energy reports.
 - A second group received the energy report and a programmable thermostats with app (they did not receive individual thermostat training).
 - A third group of homeowners received the energy report and a was enrolled in a rewards program.
- The study also examined how savings is impacted if marketing targets a focused group vs. a broader community.





Illume Advising: Behavioral Marketing Tactics Results

- Home energy reports, thermostats and rewards study results:
 - Overall, the additional energy saved by adding rewards and thermostats was incremental, and not as significant as anticipated.
 - Adding rewards to the report did show an increase in the average energy savings.
 - Adding a programmable thermostats, however, did not significantly increase energy savings.
- Target audience study results:
 - When scaling home energy reports from a targeted group of high energy users to a broader population there was an overall decrease in energy savings, however it was seen to be beneficial because a larger percentage of the community was treated.
 - People who have recently moved are often overlooked in behavioral studies because of change of address and lack of utility usage history, however they are a key target audience for implementing EE measures.





Resources on Fostering Behavior Change

- A recent <u>ACEEE paper</u> was published examining how competition in the form of gamification effects energy savings.
- A paper published in the <u>Utility Horizons Quarterly</u> examines behavior changes based on time.
- A <u>Cadmus evaluation report</u> showed the importance of persistence, where homeowners that did not receive an annual energy report saved 20% less than those who received ongoing, annual reports.
- Behavior, Energy & Climate Change (<u>BECC</u>) 2014 conference presentation on <u>Residential EE and Solar Adoption Behavior: An Online</u> <u>Gamification Study</u>
- <u>Call summary</u> from the July 2014 Better Buildings Residential Network
 Peer Exchange call on "Incorporating Change into Energy Efficiency
 Programs" featuring program examples from Kansas City and Connecticut
- Behavior-based energy efficiency resources from the State and Local Energy Efficiency Action Network (<u>SEE Action</u>)





Closing Poll Results

- After today's call, what will you do?
 - Seek out additional information on one or more of the ideas: 50%
 - Consider implementing one or more of the ideas discussed: 38%
 - Make no changes to your current approach to using behavior-based strategies: 12%
 - Other (please explain): 0%





LET'S ALL MEET IN MAY!

REGISTER TODAY for the BETTER BUILDINGS SUMMIT

Washington, DC - May 27-29, 2015

SAVE YOUR SPOT NOW:

http://www1.eere.energy.gov/buildings/betterbuildings/summit/

This Summit will bring together Better Buildings partners and stakeholders to exchange best practices and discuss future opportunities for greater energy efficiency in America's homes and buildings.

There will be time set aside for a specific Residential Network discussion and meet-up!





Thank you!

Please send any follow-up questions or future call topic ideas to: peerexchange@rossstrategic.com



