

Better Buildings Residential Network Peer Exchange Call Series: Staged Upgrades as a Strategy for Residential Energy Efficiency

June 18, 2015

Call Slides and Discussion Summary



Agenda

- Call Logistics and Introductions
- Residential Network and Peer Exchange Call Overview
- Overview of DOE Staged Upgrades Initiative
 - Steve Dunn, U.S. Department of Energy
- Participant Poll
- Featured Presenters
 - Jennifer Parsons, United Illuminating Company, Southern Connecticut Gas, and Connecticut Natural Gas (Energize Connecticut)
 - Sarah Edwards, Midwest Energy Efficiency Alliance (Iowa HVAC SAVE Program)
- Discussion
 - What are challenges, needs and opportunities to advance staged upgrades in the home upgrade market?
 - Which transaction points offer the best opportunities to market staged upgrades?
 - What approaches can be employed for working with trades, manufacturers, and distributors?
 - What role should DOE play to help develop staged upgrade markets and programs?
- Closing Polls





Call Participants (1 of 2)

- Arlington County, VA
- Association for Energy Affordability
- Association of Polish Electrical Engineers
- Baltimore Gas & Electric, MD
- Boulder County, CO
- Building Performance Institute (BPI)
- Cascadia Consulting Group
- Center for Energy and Environment, MN
- City and County of Denver, CO
- City of Plano, TX
- Consortium for Energy Efficiency (CEE)
- City Utilities of Springfield, MO
- Clean Energy Works, OR
- CLEAResult
- Columbia Water & Light, MO

- Confluence Communications
- Conservation Services Group
- Ecology Action, CA
- Economic Opportunity Studies, Inc.
- Efficiency Nova Scotia
- EfficiencyOne
- Elevate Energy
- Environmental Design / Build
- Eversource
- Florida Solar Energy Center
- Focus on Energy
- Greater Cincinnati Energy Alliance
- Habitat for Humanity
- ICF International
- Island Institute
- JP Consulting, IL
- Leidos Engineering





Call Participants (2 of 2)

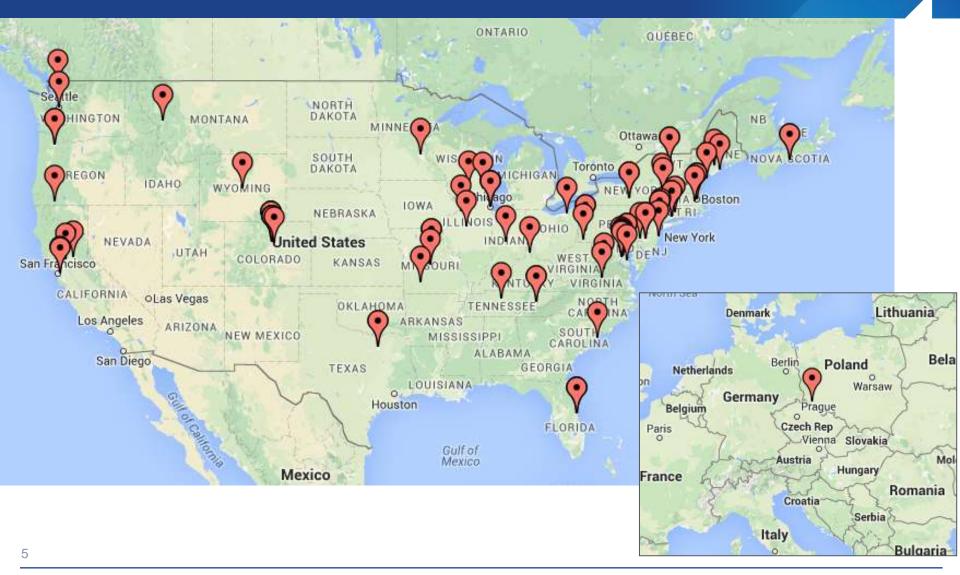
- Local Energy Alliance Program (LEAP), VA
- Maine Market Monitor
- Massachusetts Dept. of Energy Resources
- Midwest Energy Efficiency Alliance
- Mitsubishi Electric Cooling and Heating
- North American Insulation Manufacturers Association
- Natural Resources Defense Council (NRDC)
- New Jersey Natural Gas
- New York City Mayor's Office of Sustainability
- New York State Energy Research and Development Authority (NYSERDA)

- Omstout Consulting
- Opportunity Council
- Organizing in the Third Industrial Revolution
- Pearl Home Certification
- Performance Systems Development (PSD)
- Puget Sound Energy
- Purdue University
- Snugg Home
- United Illuminating Co./UIL Holdings Corp.
- Thousand Home Challenge
- TRC Energy Services
- Vermont Energy Investment Corporation (VEIC)
- Yolo County Housing, CA





Call Participant Locations







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

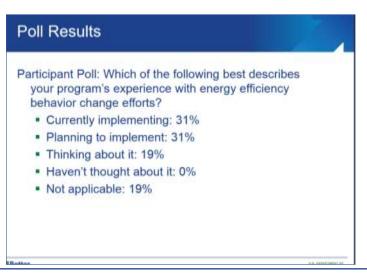
- Calls are held the 2nd and 4th Thursday of every month at 12:30 and 3:00 ET
- Calls cover a range of topics, including financing & revenue, data & evaluation, business partners, multifamily housing, and marketing & outreach for all stages of program development and implementation
- Upcoming calls:
 - June 25, 12:30 ET: Creative Financing Approaches for Residential Energy Efficiency Programs
 - June 25, 3:00 ET: Strengthening the Front Lines: Sales Training and Continuing Education for Contractors
 - July 9, 12:30 ET: Social Media and Messages that Matter: Top Tips and Tools
 - July 9, 3:00 ET: The Dog Days of Summer: Capitalizing on the Pet Market
- Send call topic ideas to <u>peerexchange@rossstrategic.com</u>.

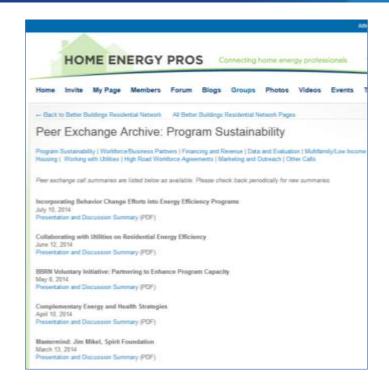




Peer Exchange Call Summaries

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





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 – We Want Your Input!

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!



https://bbnp.pnnl.gov/





Overview of DOE Staged Upgrades Initiative Steve Dunn, U.S. Department of Energy





Staged Upgrades as a Strategy for Residential Energy Efficiency

Steve Dunn
U.S. Department of Energy

Better Buildings Residential Network Peer Exchange

June 18, 2015

Staged Upgrades Initiative (SUI)



A new RBI deployment initiative that will:

- Help DOE accelerate residential energy savings from one or more 'simple to implement' measures that can be deployed and scaled to a high volume of transactions
- Capture and leverage transactions that are normally happening in the course of homeownership and contractor trades / businesses
- Deliver greater value and superior energy performance for market actors and consumers
- Provide a pathway to completing measures over time, and whole home programs such as Home Performance with ENERGY STAR

Why Staged Upgrades?



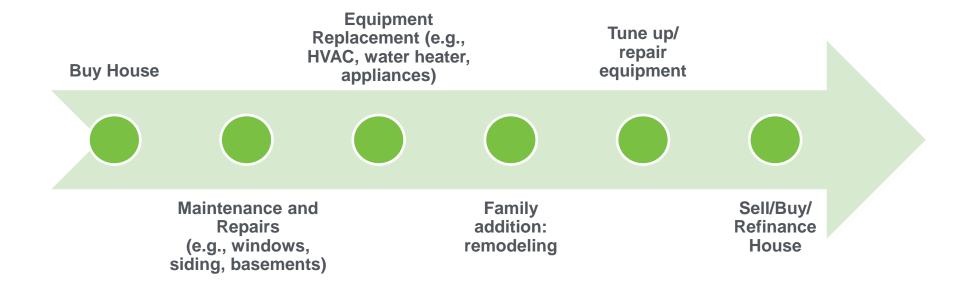
Staged upgrades can help homeowners:

- Get greater energy savings from work they are already planning
- Identify complementary
 measures to save money and
 achieve additional benefits
 (comfort, health, cost
 savings)
- Get on a path to whole home upgrades over time to achieve greater energy savings



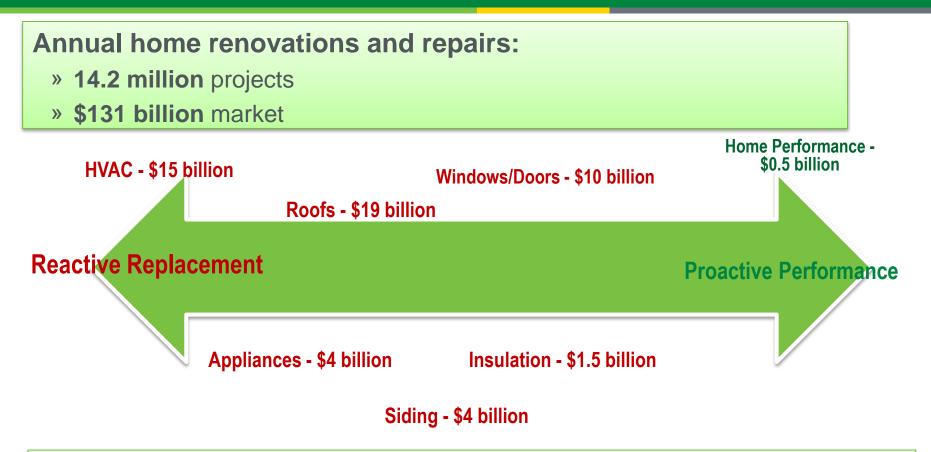
Vision: Tap into the transactional moments of homeownership





Staged Upgrade Initiative: Opportunity to Leverage High-Volume Markets





Opportunity: If ONLY 5% of these transactions were 5% more energy efficient, it would result in savings of over 1.4 TBtu and \$30 million annually

Source: Harvard University Joint Center for Housing Studies, 2013.

SUI Framework (proposed)



DOE Framework

- Develop guidance, tools and resources to support multi-measure approaches
- Engage consumers via programs, trades and other market actors
- Test delivery channels and approaches, develop trade-specific resources and business models

Pathway for continuous improvement

Single measure improvement (5-10% savings) Systems of measures (10-20% savings)

Whole house comprehensive improvement (>20% savings)



Influencing the Stages along the Path

- Provide technical support for installation improvements (e.g., field guides, technical data on measures and climate-specific savings opportunities)
- Develop and test tools, resources and delivery channels to provide recommendations to consumers (e.g., Home Energy Score, 3rd party software tools, contractors, utilities, energy raters, inspectors etc.)
- Analyze and develop measure packages, business models and program design strategies

Initial Focus: Leveraging the HVAC Transaction



- \$15 billon market
- Seasonal services
- Repair and upgrade work
- Remodeling work



How can we impact these transactions to improve efficiency?

What's next



Messaging Tools and Guidance

- Staged Pathways
 - Step/process guidance for contractors and programs on recommended sequence, combinations of measures, IAQ, health/safety factors, etc.
 - Messaging toolkit to address trigger events, consumer messaging, technology options
- Measure Focus: HVAC
 - Getting to "better" for quality installation practices
 - Develop and test staged upgrade business models for HVAC with valueadded opportunities

Upcoming Milestones

 Engage and solicit input from Program Administrators and Market Actors

Spring – early Summer

- Field Tests with interested partners (Concept Pilot)
 Summer – Fall
- Evaluation/Assessment to inform expansion plan
 Winter

For More Information



Questions?

Steve Dunn, Project Manager DOE Building Technologies Office

Caroline Hazard, SRA International

Staged Upgrades Initiative Discussion

- The staged upgrade approach is meant to be flexible:
 - Programs could coordinate with utilities to develop or adapt incentives to support certain energy efficiency measures
 - Another option could be negotiating bulk purchases
- Bundling measures together as a portfolio approach could help meeting utility cost effectiveness tests, as some individual measures may be less cost effective than others
- DOE plans to develop tools and resources to help programs incorporate staged upgrade approaches into their existing work
 - Later, this could be integrated into other DOE programs, such as Home Performance with ENERGY STAR





Research Reports and Studies on Staged Upgrade Approaches to Residential Upgrades

- Joint Center for Housing Studies of Harvard University. 2013. "The U.S. Housing Stock: Ready for Renewal."
 www.jchs.harvard.edu/sites/jchs.harvard.edu/files/harvard_jchs_remodeling_report_2013.pdf.
- National Home Performance Council. 2013. "Bringing on the Boom and Beating the Bust. A Framework for Developing a Roadmap to a Successful Home Performance Industry." www.homeperformance.org/policy-research/resources/reports
- U.S. DOE Building America Program. Nov. 2011. "Technical Barriers, Gaps, and Opportunities Related to Home Energy Upgrade Market Delivery." M. V. A. Bianchi, National Renewable Energy Laboratory. http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/tech_barriers.pdf
- U.S. DOE Building America Program. 2013. "The Next Step Toward Widespread Residential Deep Energy Retrofits. Building America Partnership for Improved Residential Construction."
 http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/widespread_deep_energy_retrofits.pdf
- U.S. DOE Building America Program. April 3, 2015. Draft Technology-to-Market Roadmaps (public comment version). http://energy.gov/eere/buildings/articles/building-america-technology-market-roadmaps-request-information
- Wigington, L. 2010. "Staged approaches for deep energy reductions in existing homes." ACEEE Summer Study, paper 2-339.
 - www.aceee.org/files/proceedings/2010/data/papers/2299.pdf





Participant Poll

- Which of the following best describes your organization's experience with staged upgrades?
 - Very experienced/familiar: 28%
 - Some experience/familiarity: 29%
 - Limited experience/familiarity: 19%
 - No experience/familiarity: 14%
 - Not applicable: 10%





Program Perspective: Jennifer Parsons United Illuminating Company, Southern Connecticut Gas, and Connecticut Natural Gas (Energize Connecticut)





Energize CT Upstream Program

Jennifer Parsons - UI, SCG, and CNG

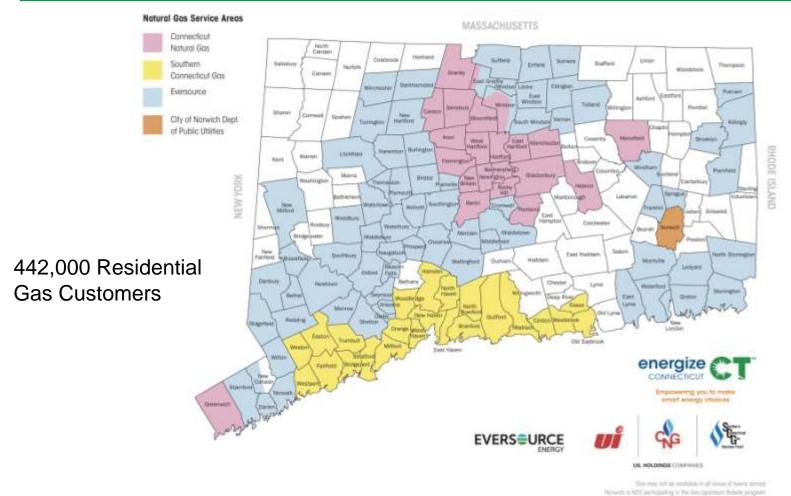


Energize Connecticut

- Energize Connecticut is the state's branding initiative to help consumers save money and use clean, affordable energy.
- Created in 1998 with natural gas programs added in 2005.
- A partnership of the Energy Efficiency Fund, the Connecticut Green Bank, Department of Energy and Environmental Protection (DEEP), and the local electric and gas utilities.

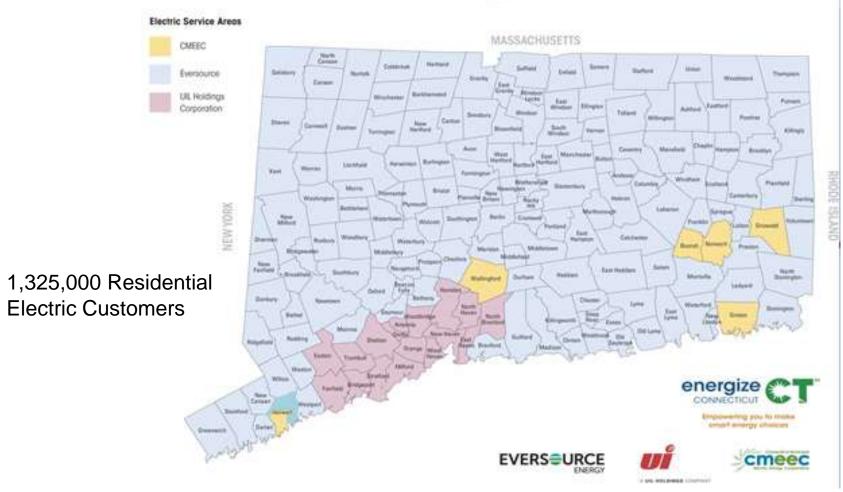


CT Service Territory: Natural Gas





CT Service Territory: Electric





Energize CT Programs/Services

- Home Energy Solutions
- Home Energy Solutions Income Eligible
- Home Performance with ENERGY STAR®
- Residential New Construction
- Retail Lighting
- HVAC and Water Heating Program
- Energize Connecticut Center North Haven, CT

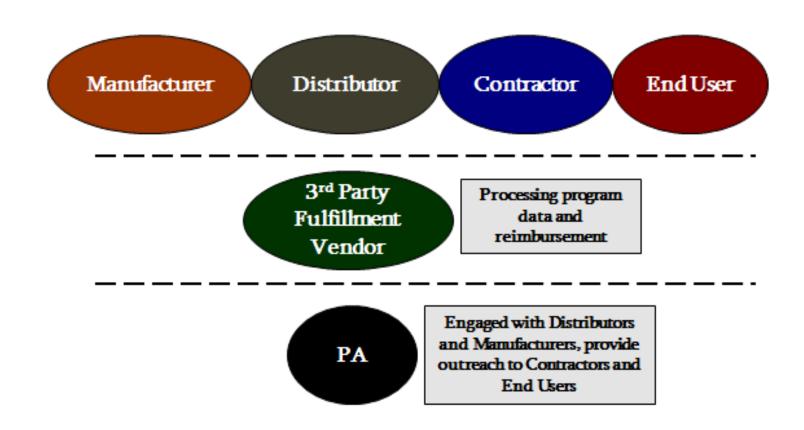




Going Further in the Home With

Upstream HVAC and Water Heating Incentives

What is "Upstream"?





Benefits of Upstream Programs

Stakeholder	Benefits
Manufacturer	 Opportunity to balance product mix Push latest technology to market
Distributor	 Increased profits and market share Opportunity to transform end market
Contractor	 Lower first cost No rebate completion required Sales and marketing tool to sell jobs
End-users	 No rebate processing (time and money) Lower first cost Energy and lifetime cost savings
Utility	 Eliminate loss of savings associated with forms Opportunity to reach larger customer base



Residential Upstream Incentives

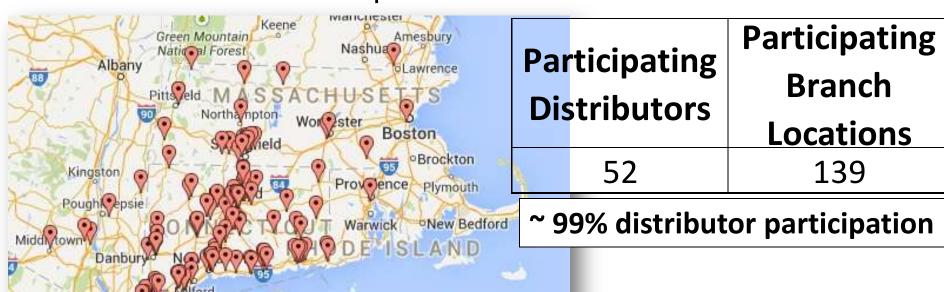
Eligible ENERGY STAR® Equipment

- Natural Gas Water Heaters:
 - Tankless 0.82-0.93 EF = \$300
 - Tankless 0.94 EF+ = \$500
 - Condensing 95% TE = \$300
 - Storage 0.67 EF + = \$100
- Heat Pump Water Heaters: \$400
- ECM Circulator Pumps = \$100
- Natural Gas Boilers = \$750
- Natural Gas Furnaces = \$600, Oil and Propane = \$200



Gas Distributor Enrollment Success

- Program Pilot began October 2013
- Statewide Rollout April 2014





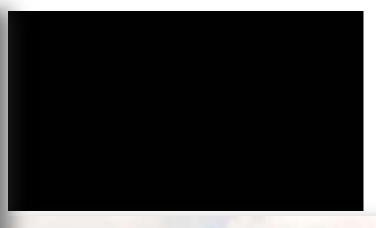
Yonkers

New York

Marketing

Point of Purchase (POP) Signage, Radio, and Billboards











Gas Water Heating: on TV

https://vimeo.com/channels/719455/93668883



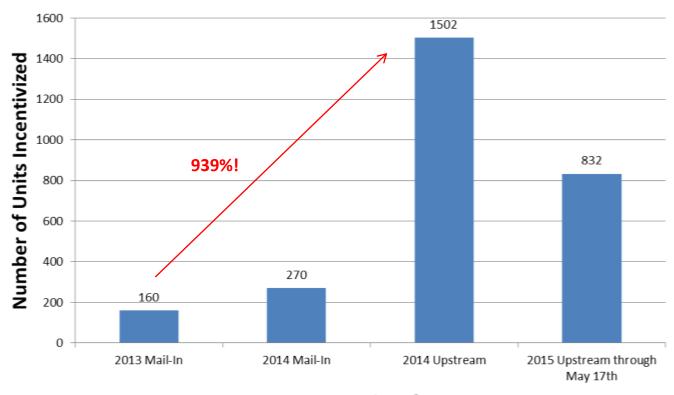
Quality Assurance

- Rebate vendor verifying against double-dipping (during rebate transition period)
- Counter day events with Circuit Rider vendor
- Gas territory placemats
- Post inspections + telephone surveys
- Customer "thank you" postcard:





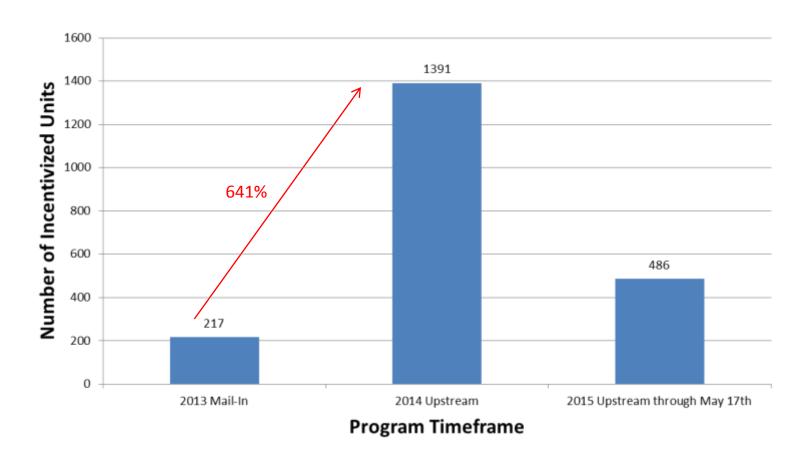
Gas Water Heater Program Success



Program Timeframe



Heat Pump Water Heater Program Success





C&I Proposed Upstream Program

Equipment Type	Minimum Efficiency Requirement	Incentive
Storage-Type Domestic WH	Thermal Efficiency of 90% or greater	\$5.00 / Input MBH
On-Demand Domestic WH	Input less than 200,000 BTU/H and Energy Factor must be 0.85 or greater	
	Input greater than or equal to 200,000 BTU/H and Thermal Efficiency must be	\$4.00 / Input MBH
	90% or greater	
Large Domestic HW Boiler	Input greater than 75,000 BTU/H and Thermal Efficiency must be 85% or	\$2.00 / Input MBH
	greater	

- Current mail-in form
- Considering tiered structure based on BTU



Other Program Successes

- Strengthened relationship with HVAC community
- Reduction in rebate fulfillment costs
- Reduction in paperwork flow (less trees)
- Significant increase in C&I program participation and other residential programs



Questions?

Jenn Parsons – UI, SCG, CNG

Jesus Pernia – Eversource

EnergizeCT.com/gaswaterheating

EnergizeCT.com/hpwh

EnergizeCT.com/highefficiencyheating



Program Perspective: Sarah Edwards, Iowa HVAC SAVE Program and Midwest Energy Efficiency Alliance





HVAC SAVE: Transforming Iowa's Residential HVAC Market

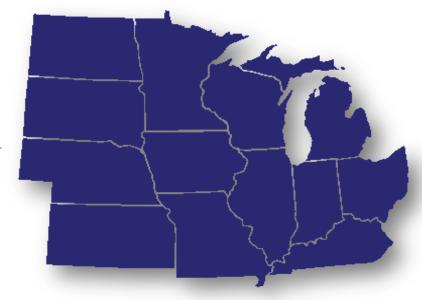
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Midwest Energy Efficiency Alliance

MEEA is a nonprofit organization bridging the gap between energy efficiency policy development & program implementation





MEEA's Role in the Midwest

- Nonprofit serving 13 Midwest states
- 10+ years serving states, energy offices, utilities & communities
- 25 Staff
- MEEA:
 - Designs & administers energy efficiency programs
 - Evaluates & promotes emerging technologies
 - Serves as regional/national voice for DOE/EPA & ENERGY STAR
 - Coordinates utility program efforts
 - Delivers training & education
 - Advances energy efficiency policy
 - Promotes best practices





What is HVAC SAVE?

• HVAC SAVE (System Adjustment and Verified Efficiency) is a utility program that recognizes that HVAC equipment operating performance does not equate to rated performance, that reasonable losses occur at the installation and in the duct system, and that those losses can be mitigated and incremental savings captured.



HVAC SAVE Elements

Training and Certification

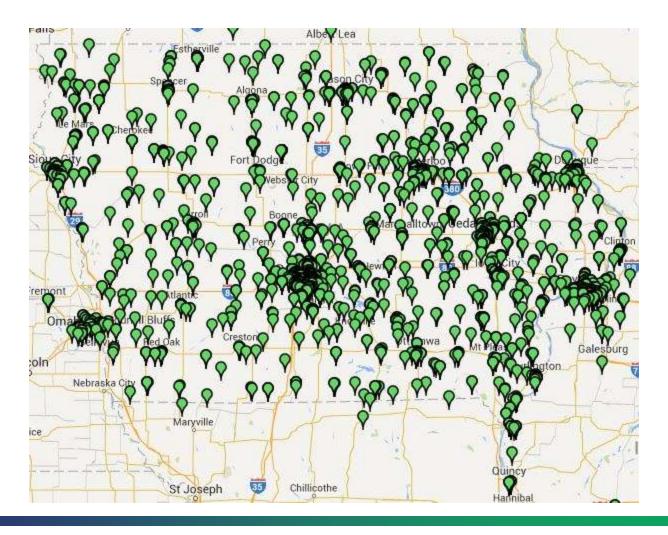
- MEEA created certification and partnered with ESI
- Develops pool of trained and certified HVAC professionals

Field Performance Testing

- Move classroom into the field
- Focus on Quality Installation practices
- Measure, adjust and verify
- Online reporting tool (www.hvacsavesoftware.com)



HVAC SAVE Trained Contractors in Iowa





Support for HVAC SAVE

- 2010: HVAC SAVE program started training Iowa contractors
 - MidAmerican Energy, Alliant Energy, and Black Hills Energy include it in their 2014-2018 EE plans
 - Requirement for residential heating/cooling equipment rebates
 - MidAmerican introduced a performance tune-up and duct modification rebate
- January 1st, 2014: HVAC SAVE became a requirement for a furnace, AC, ASHP, GSHP rebate
- Variety of rebates available depending on the utility
 - Separate rebates available for equipment vs ductwork vs maintenance
- Distributors have been promoting HVAC SAVE to their customers in addition to hosting trainings at their facilities











Program Outcomes

- Over 2,200 contractors have been HVAC SAVE certified
- Over 110 trainings have been held in Iowa and Illinois
- In 2014 alone, there were 22,000 jobs run in the HVAC SAVE software



Questions?

- Contact Sarah Edwards, MEEA
- Website: www.hvacsave.com





Discussion Questions

- What are challenges, needs and opportunities to advance staged upgrades in the home upgrade market?
- Which transaction points offer the best opportunities to market staged upgrades?
- What approaches can be employed for working with trades, manufacturers, and distributors?
- What role should DOE play to help develop staged upgrade markets and programs?





Program Experience with Staged Upgrades

- Iowa HVAC SAVE program is focused on ensuring high-quality installations, supported by diagnostics. The additional work takes 30-45 minutes, and this has made it work from the business side.
- Energize CT has seen great success with moving equipment rebates upstream— providing equipment discounts to distributors in return for sharing info on where the equipment is installed.
- Clean Energy Works (CEW) in Oregon has partnered with other contractors to provide other types of upgrades along with energy efficiency, including seismic, radon, and solar.
 - This summer CEW plans to partner with HVAC contractors, training them to conduct a light energy audit, then use that information to do more comprehensive upgrades.
- New Jersey Natural Gas conducts energy audits with Home Energy Scores to motivate customers to take action. Then the program conducts credit evaluations to support loans for upgrades if needed.





Tips for Staged Upgrade Initiatives

- Working with contractors on staged upgrade initiatives is critical they are the main point of contact with customers.
- One of the greatest challenges facing home performance contractors is generating customer leads. Since HVAC technicians conduct thousands of home visits every day, this could be an important leverage point for engaging homeowners.
- HVAC contractors do not need to be full energy diagnosticians, but they should know simple things to look for that could trigger the need to schedule a visit with an energy advisor.
- Many home upgrade decisions are responsive (i.e., when things are broken), but it can be useful to ask homeowners about their overall goals for improvements (e.g., the value of a healthy, durable home).





Closing Poll

- Which of these staged upgrade (SU) topics for future peer discussion is of most interest to you?
 - Marketing and outreach to homeowners on SU: 31%
 - SU program design options: 29%
 - Measuring SU energy savings: 20%
 - Coordinating trades and supply chains for SU delivery: 20%
 - Other: 0%

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



