

RESIDENTIAL WHOLE HOUSE

**COUNCIL WORKSHOP
FEBRUARY 26, 2015**



HOME ENERGY SERVICES

OVERVIEW



Description	Measures and Practices Encompassed by Initiative	% of Savings Lifetime (2013)
<p>In-home energy assessment providing site-specific recommendations to improve the energy efficiency of 1-4 family homes using a whole house approach.</p> <p><i>Income eligible customers (customers on the discount rate) are served through the Low Income program.</i></p> <p><i>The Multi-Family Retrofit Initiative serves buildings with 5+ units.</i></p>	<ul style="list-style-type: none"> -Direct install of no/low cost instant savings measures -Consumer education via house as a system approach -Creation of a site-specific home energy report -Turn-key weatherization services provided by participating, qualified contractors -Cross promotion of electric and gas products offerings -Early boiler and furnace replacement -Access to non-regulated fuel heating/hot water rebates -Access to 0% HEAT Loan financing 	<p>16% Electric</p> <p>42% Gas</p> <p>57% Total Benefits</p>

HES DELIVERY CHANNELS

Functions	Delivery Options		
	Customers call Mass Save, and LV allocates projects to contractors	Customers call contractors, or contractors find projects through their own means	
Call Center Intake, Contractor Coordination, Data Management, Other	LV	LV	
Energy Assessments	LV	LV	
Measure Installation	Independent Installation Contractors (IICs)	Independent Installation Contractors	Home Performance Contractors (HPCs)
Quality Assurance	Statewide Quality Assurance/Quality Control (QA/QC) Vendor and/or Lead Vendor		

BPWG facilitates on-going communication among parties to inform continuous improvement.

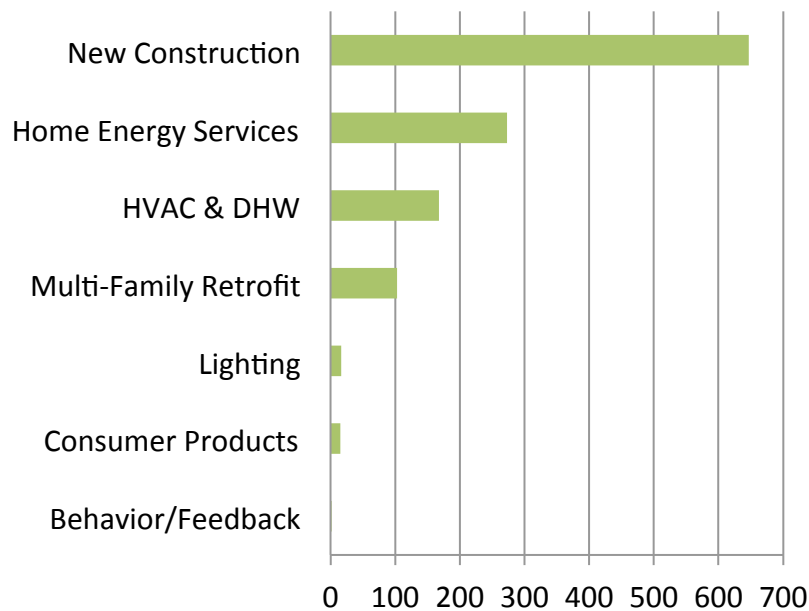


HES OPPORTUNITIES

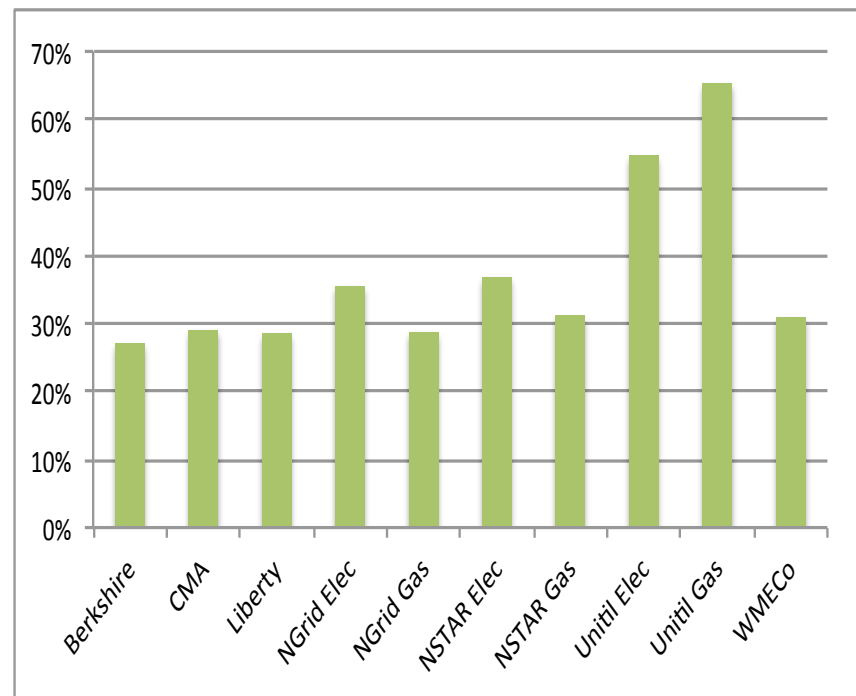
USING INDICATORS TO MEASURE DEPTH OF SAVINGS

Performance indicators can be helpful to track progress and trends, but don't always tell the whole story...

2013 Lifetime Savings per Participant (MMBtu), all Fuels



2013 HES Conversion Rates by PA



INCREASE DEPTH OF SAVINGS



- ▶ Increase rate at which recommended measures are installed
- ▶ Promote deep energy retrofits statewide and/or further expand deeper savings measures
- ▶ Introduce custom offering targeted to comprehensiveness and measuring increased performance
- ▶ Revise tracking mechanisms to capture successful cross-program referrals (e.g., HES to HEHE and vice versa)

INCREASE SERVICES TO MODERATE INCOME CUSTOMERS, ESPECIALLY RENTERS

- ▶ Served in base HES (1-4 units) and Multi-Family Retrofit (5+) offerings, but specifically targeted in Efficient Neighborhoods+[®] and Renew Boston
 - Enhanced incentives targeted to 60-100% of state median household income (EN+--up to 120% for Renew Boston)
 - EN+ in 2014 served 52 Census blocks and two entire towns

	Representation in EN+ Treatment Communities Overall (2013)	2013 EN+ Participants
Owner	68%	88%
Renter	25%	4%
Landlord	6%	3%

INCREASE SERVICES TO MODERATE INCOME CUSTOMERS, ESPECIALLY RENTERS

- ▶ Define target market and implementation roles
 - 60%-80% 100%? 120%? median income, qualification process to be determined
 - Interest from LEAN as well, will most likely require some level of collaboration and cross-program tracking (and with multi-family as well)
- ▶ Deploy at scale
 - Apply lessons learned in EN+, Renew Boston and elsewhere in a statewide offering
- ▶ Devise methods for benchmarking and tracking progress
- ▶ The Residential Barriers Working Group could provide valuable input

PROVIDE NEW AND/OR REVISED MEASURES AND PRACTICES

- ▶ Insulation
- ▶ Assess cold climate heat pumps as early replacement measure (considerations include RCS regulation changes and cost effectiveness)
- ▶ Home scorecards
- ▶ Harmonize with efforts of MA Clean Energy Center and others
- ▶ Leverage pending revisions to Residential Conservation Services regulations and guidelines to open new doors

CONTINUE TO REFINE KEY PROGRAM ASPECTS



- ▶ Market-based program delivery model
 - Contractor performance criteria
 - Workforce development
 - Recommendations to customers
- ▶ HEAT Loans
 - Alternative financing methods for customers who don't qualify
 - Appropriate financing level for securing customer investment
 - Measures included
 - Allocation methods for savings and goals



KEY QUESTIONS

DEEPER SAVINGS



What approaches to achieving deeper savings offer the best opportunities for increasing depth of savings in a cost efficient manner while providing a high quality experience for the customer? For example:

- Deep energy retrofits
- Improving rate at which recommended measures are installed
- Testing a comprehensive/customized approach to savings
- Other

MODERATE INCOME CUSTOMERS AND RENTERS



1. How could/should efforts to serve moderate income customers be revised and expanded to a larger scale in the 2016-2018 Plan?
2. How can renters in particular be more effectively reached and served?

NEW MEASURES AND PRACTICES



What revised or new measures or practices should be considered for inclusion in HES for 2016-2018?

HOME ENERGY ASSESSMENT



How can we make the most of the home energy assessment opportunity while at the same time avoiding overburdening the auditor and the customer? For example:

- Clear energy scorecards
- Fuel neutral heating system recommendations

DELIVERY MODEL



Are there continued refinements to the contractor-based program delivery model that would be beneficial to the PAs, contractors, and customers?

HEAT LOANS



Are there further enhancements or modifications to the HEAT Loan offer that should be considered for 2016-2018?

COORDINATION AND DEEPER SAVINGS



How can the Whole House and Products Programs be better coordinated to promote efficient products and encourage their proper installation in existing homes, including expanding early replacement opportunities, and support a more complete accounting for achievement of deeper savings?



NEW CONSTRUCTION

OVERVIEW



- ▶ Initiative serves
 - Low-rise new construction: prescriptive
 - Low-rise new construction: performance
 - Multi-family high rise new construction (4 stories+)
- ▶ Recent market highlights
 - Serving approximately 15,000 units/year
 - Preliminary year end results (% of sector savings): 7.5% annual gas, 15% lifetime gas; 2% annual electric, 2.7% lifetime electric
 - Shift to multi-family (moving to more than 50 percent of market in 2014)
 - Shift from prescriptive path to performance path

OPPORTUNITIES

- ▶ Increase support for zero net energy construction
 - Require that new construction receiving PA incentives at at least the highest tier(s) be “renewable ready”
 - Offer a ZNE incentive tier for the 2016-2018 New Construction Initiative
- ▶ Continue to introduce new technologies
 - Home automation

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Renewable Energy Ready Home Solar Photovoltaic Checklist

Home Location:		City:	State:		
RERH Checklist (See Renewable Energy Ready Home (RERH) specifications for details)				Builder Verified	NA
1.1	Designate a proposed array location and square footage on architectural diagram: _____ sq. ft.			<input type="checkbox"/>	
1.2	Identify orientation (azimuth) of proposed array location: _____ degree.			<input type="checkbox"/>	
1.3	Identify inclination of proposed array location: _____ degree.			<input type="checkbox"/>	
1.4	Conduct a shading study documenting impacts on proposed array location: _____ % adjusted annual shading impact. If using monthly values as verified through the solar path assessments, check here: _____.			<input type="checkbox"/>	
1.5	Assess if proposed array location supports a solar resource potential of more than 75 percent of the optimal solar resource potential for the same location using the online RERH Solar Site Assessment Tool (SSAT). Yes <input type="checkbox"/> This home meets the minimum recommended solar resource potential of 75 percent per the RERH SSAT results; continue with Section 2 below. No <input type="checkbox"/> This home does not meet the recommended solar resource potential per the RERH SSAT results; this location is not a good host for a future solar energy system and should not be made renewable energy ready.			<input type="checkbox"/>	
2.1	Provide code-compliant documentation of the maximum allowable dead load and live load ratings of the existing roof; recommended allowable dead load rating can support an additional 6 lbs/sq. ft. for future solar system.			<input type="checkbox"/>	
2.2	Install permanent roof anchor fall safety system (NA for roof pitch ≤ 3:12).			<input type="checkbox"/>	<input type="checkbox"/>
3.1	Install and label a 4' x 4' plywood panel area for mounting an inverter and balance of system components.			<input type="checkbox"/>	
3.2	Install a 1" metal conduit for the DC wire run from the designated array location to the designated inverter location (cap and label both ends).			<input type="checkbox"/>	
3.3	Install a 1" metal conduit from designated inverter location to electrical service panel (cap and label both ends).			<input type="checkbox"/>	
3.4	Install and label a 70-amp dual pole circuit breaker in the electrical service panel for use by the PV system (label the service panel).			<input type="checkbox"/>	
3.5	Provide architectural drawing and riser diagram of RERH solar PV system components.			<input type="checkbox"/>	
4.1	Provide to the homeowner a copy of this checklist and all the support documents listed below (to be provided to future solar designer). - Copy of the Renewable Energy Ready Home Specification guide - Fully completed RERH checklist (all sections) - Architectural drawings detailing proposed array location and square footage - Electrical drawings and riser diagram of RERH PV system components that detail the dedicated location for the mounting of the balance components - Shading study with percent monthly or adjusted annual shading impact(s) - Site assessment record generated by the online RERH SSAT indicating that the proposed site meets a minimum solar resource potential of 75 percent of optimal - Code-compliant documentation of the maximum allowable dead load and live load ratings of the roof			<input type="checkbox"/>	
4.2	Record electric utility service providers contact information: Electric utility service providers name and Web address:				
5.1	Develop a detailed landscape plan with a clear emphasis on low-growth vegetation			<input type="checkbox"/>	<input type="checkbox"/>
5.2	Place roof penetrations above or north of the proposed array to prevent casting shadows on the array location			<input type="checkbox"/>	<input type="checkbox"/>
Builder Completion Date:				Builder Company Name:	

KEY QUESTIONS



- ▶ What role could the PAs play in supporting expanded efforts to construct zero net energy homes?
- ▶ How should emerging technologies such as home automation and renewables be integrated into residential new construction in Massachusetts?



BEHAVIOR

OPPORTUNITIES



- ▶ Behavior program offerings from all PAs
- ▶ Combine gas and electric behavior reports across
 - In limited deployment at this time
- ▶ Implement new behavior approaches utilizing new technologies with a view to a larger customer engagement strategy

KEY QUESTIONS



1. Should the specific opportunities outlined above be pursued?
2. How might PAs' behavior programs most effectively drive participation in their other programs?