



## MEMO

**To:** Cape Light Compact, National Grid Electric, NSTAR Electric, and Western Massachusetts Electric Company

**From:** Dorothy Conant

**Date:** June 7, 2012

**Re:** Major Renovations Pilot Evaluation

The Major Renovations Pilot (Pilot) has recently been redesigned to be more contractor oriented, address any size addition or partial gut renovation, and use Building Performance Institute (BPI) certified building analysts and building envelope professionals in addition to HERS (Home Energy Rating System) raters as verifiers. Incentives and rebates have also changed. The Pilot has changed so much that Sponsors decided a full evaluation of projects completed in 2011 was not necessary. At the time this decision was made, 14 interviews had already been conducted with a mix of home owners, architects and builders involved with 11 completed projects.

The redesigned 2012 Major Renovations Pilot Program (Program) reflects changes made in response to the Program Implementation Manager's experience administering the Pilot and preliminary findings from interviews conducted in October and December 2010 with seven homeowners and one builder who had projects eligible to participate in the Pilot and considered enrolling in the Pilot, but decided not to enroll.<sup>1</sup> Two documents provided by ICF are attached that provide more detail on the revised 2012 Pilot design. One is a list of changes to the Pilot design for 2012 and the other is a marketing brochure for the 2012 Pilot.

The preliminary interviews with potential participants who decided not to enroll in the Pilot showed the interviewed homeowners and builder were clearly committed to making sure their projects were energy efficient, but did not think that participating in the Pilot would be cost-effective. Their suggestions for ways to make participation in the Pilot more user-friendly for homeowners focused on providing a clearer description of what the Pilot offered and the cost of participating in the Pilot, especially the cost of hiring a HERS rater.

Interviews with homeowners who enrolled in the Pilot and completed an addition project showed they were generally satisfied with their experience participating in the Pilot, satisfied with the rebates and incentives they received, and satisfied with the HERS rater they worked with. Seven of the eight interviewed home owners said they found working with a HERS rater was valuable

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<sup>1</sup> The Massachusetts New Homes with ENERGY STAR<sup>®</sup> Program: Major Renovations Pilot Evaluation Preliminary Report on Non-Participant Interviews. NMR Group Inc. and Dorothy Conant. April 4, 2011.

and that they thought the cost of working with the HERS rater was reasonable for the services provided. Their basic suggestions for how to improve the Pilot or make it more user friendly for homeowners, listed below, are consistent with the suggestions from potential participants who decided not to enroll in the Pilot:

- Make Pilot requirements clearer
- Provide more information on what other programs a project might qualify for
- Broader marketing of the Pilot
- Limit rater/consultant fees
- Provide more clarity on rebates available and faster processing of rebates

This remainder of this memo summarizes findings from the interviews with homeowners, architects and builders involved with completed projects, focusing on satisfaction with the Pilot and suggestions for how the Pilot could be improved or made more user-friendly. In addition it summarizes a discussion with a HERS rater who worked with 5 of the 11 completed projects.

## **Satisfaction**

In general, interviewees said they were satisfied with their experience participating in the Major Renovations Pilot. All but one of the 14 interviewees said they were “satisfied” (9) or “very satisfied” (4). One of these satisfied interviewees, an architect/owner, said, “I feel like we did a whole lot of good stuff with limited resources.” Another architect said she was satisfied with the first project she worked with, but working with a second potential project she became “somewhat dissatisfied” because of confusion about Pilot requirements and the cost of hiring the third-party rater was much higher.

### **Satisfaction with Incentives and Rebates**

The eight interviewed home owners were asked how satisfied they were with the incentives and rebates they received. Six home owners said they were “satisfied” (5) or “very satisfied” (1). One home owner was “neither satisfied nor dissatisfied” and one did not respond because he had not yet received his incentive check. Three home owners commented on the size of the incentives and rebates they received. One home owner wished she could have taken advantage of more incentives for insulation; she heard from her neighbors that they received \$1,500 or \$2,000 for just installing insulation. Another home owner commented, “The rebates were not something that made me decide to do or not do the project. I would have liked it if they were bigger. It’s always nice to get more, but it is also always nice to get something.”

### **Satisfaction with Architects and Builders**

Home owners were asked how satisfied they were with the builders and architects they worked with. Of the four home owners who hired architects, two were “satisfied,” one was “very satisfied” and one was “very dissatisfied.” When asked how satisfied they were with their builders, one of the eight interviewed home owners was “satisfied,” two were “very satisfied,” two were “neither satisfied nor dissatisfied” and three were “very dissatisfied.” Reasons home

owners gave for being dissatisfied with their builders include a 50% cost overrun, time to complete the project was much longer than expected, materials used were lower quality than promised, poor quality workmanship, builder did not do work agreed to in the contract and, in two cases, builders walked off the job before it was finished.

### **Satisfaction with HERS Raters**

Seven of the eight interviewed home owners were “satisfied” (3) or “very satisfied” (4) with the HERS raters they worked with. One home owner, who was “neither satisfied nor dissatisfied,” said he was satisfied with the HERS raters he worked with but when the initial rater he had contact with was no longer available there was confusion about who he would be working with and it seemed a bit disorganized.

Seven of the eight interviewed home owners also said they found working with a HERS rater was valuable and that they thought the cost of working with the HERS rater was reasonable for the services provided. One home owner said he did not know how much value the HERS rater provided because he did not work with the HERS rater directly—his architect worked with the HERS rater.

Two of the home owners who said they were “very satisfied” with their HERS raters and found working with them was “very valuable” commented as follows:

- *“He was very good at knowing a lot of answers; we challenged each other on certain things. Plus, he had lots of cool toys to play with.”* (Owner/Architect)
- *“It was very valuable to have an opinion that was not commercially influenced.”* (Owner)

### **HERS Rater Observations**

The HERS rater who worked with five of the projects made the following observations about working with the owners of Pilot projects:

- Home owners are confused. They read different articles on what to do and get conflicting information. They want to know when to use what products—when to use foam versus other types of insulation. Typically their home is their biggest asset and they like knowing they are working with someone who is knowledgeable to help them.
- Raters can provide value by acting as an intermediary between the home owner and the general contractor to avoid misunderstandings or misconceptions about what is being done and why.
- Raters can provide value to home owners by working with them and their builders to reallocate financial resources, if appropriate, to produce a more energy-efficient project. If the home owner has a fixed budget, the rater can help the home owner decide where to spend that money to maximize energy efficiency. One example is spending \$10,000 to

replace all the windows in a home versus spending \$4,000 to install high quality storm windows and \$6,000 to blow high density insulation in all the walls from inside. Another example is pointing out to home owners that it doesn't make sense to foam all rim and band joists and then not air seal around vent holes.

- Unless the rater can gain credibility with the home owner and get them to consider changes to their project that will increase its energy efficiency, the Pilot is basically paying people to do what they were going to do anyway.

## Suggestions

Interviewees offered a variety of suggestions for how to improve the Pilot or make it more user friendly; most of these suggestions are addressed in the redesigned Pilot.

One architect suggested making the Pilot more comprehensive to encourage further energy-efficiency upgrades and also offering another program that didn't require work in the existing home and could address smaller projects that don't meet all the Pilot requirements.

One home owner suggested there could be more consistency across HERS raters; his contractor had participated previously in a program with the same requirements and complained that the HERS rater he worked with in the Pilot was more strict than the previous HERS rater he worked with.

Representative suggestions are listed below by topic.

### Make Pilot Requirements Clearer

- *“Publish all the requirements—it was very vague what the Pilot was and how it worked. I found the Pilot description and requirements confusing.”* (Owner)
- Providing a bulleted list of requirements for the Pilot, including all requirements, would be helpful. (Architect)
- *“Improve the literature to start with—I couldn't really understand who was running the Pilot and who was paying for it. I'm still not sure I understand it now. More attention to the brochure could help.”* (Owner)
- *“On pamphlets—be more clear/concise on what home owner has to do. I originally got information that just doing the heating system would have been enough to qualify for incentives; I did not realize I needed to do work to existing home.”* (Owner)
- *“I would have liked more insight into the requirements in advance so that I could have stayed on top of the contractor a bit more.”* (Owner)

### Multiple Program Options

- Provide more literature on the costs and benefits of different levels of retrofit. (Architect)
- Make clear what programs a project qualifies for and if it can participate in multiple programs. (Owner)

- Provide additional information to help home owners decide which program is the best choice for them and which programs, if any, can be combined. (Owner/Architect)
- It is confusing to determine who is funding programs (ENERGY STAR, the state or the utilities) and whether not you can apply for multiple incentives. (Owner)

### Marketing the Pilot

- Community group outreach sessions to help explain programs (Owner)
- Advertise the rebate available for builders. (Builder)
- Some sort of mass marketing (emails?) to raise awareness (Owner)
- Include a page on the web site that explains how the Pilot is beneficial to architects and some arguments and information to provide to customers—make it easy for architects to sell the Pilot to customers. (Architect)
- Provide a bulleted list of recent Pilot changes and updates. (Architect)

### Rater/Consultant Fees

- Offering a free initial consultation with a third party professional representing the interests of the Pilot to provide objective advice about the incremental cost of improvements and best practices would be useful. (Architect)
- *“Set the price for the HERS rater so that cost is known upfront versus being discovered mid-way through a project. It takes time to find out which HERS rater will be the cheapest and it is confusing why the cost has gone up so dramatically. The HERS rater fee is never presented in an estimate, just billed as what it costs. Make it clear how the HERS rater is compensated—are they paid just by the home owner or also reimbursed by the Pilot?”* (Architect)

### Rebates

- *“Whoever applies for the rebate gets the rebate. That's a little weird since I usually apply on behalf of the home owner or, in the past, take it off their bill. There could be a way to set this up differently.”* (Builder)
- *“Dealing with various time frames for various rebate programs was a pain. I almost missed the opportunity to get a gas networks rebate because I didn't quite realize when the installation would be. As a home owner that is frustrating.”* (Owner/Architect)
- *“One of the things that I like to be able to provide to my clients, and what they expect, is a list of what rebates are available and what they add up to for a project. There are too many different programs that are not correlated to perform that calculation. Provide something comprehensive and available on line to help a builder provide a comprehensive list capturing all rebates and incentives a home owner can apply for. Once you have a HERS rater assigned to a project that person should be knowledgeable about all available rebates and incentives.”* (Owner)
- Speed up the administration process—minimize delays in issuing incentives. (Builder)

## Attachment I:

### Major Renovations Pilot Program

*Changes to the pilot design for 2012<sup>2</sup>*

CURRENT DESIGN		NEW DESIGN
HERS Raters as verifiers	→	HERS Raters, BPI Building Analysts and BPI Building Envelope Professionals that are HPC and lead vendors with the Mass Save HES program
Pre-construction diagnostic testing required	→	Estimated blower door number of 10.72, taken from the Analysis of Onsite Audits in Existing Homes in Vermont
Homeowner focused program	→	Contractor focused program but homeowners can initiate.
500+ sq. ft. addition required	→	Any size addition or partial gut renovation
Test all ductwork for air leakage	→	Visually inspect existing ductwork for air tightness and use BPI defaults to estimate air leakage. All completely new air distribution systems must be duct tested.
Verifier CFL incentive \$4 per bulb	→	Verifier CFL incentive \$3 per bulb
Verifier incentive \$1,050	→	Verifier incentive \$300
Project has 1 year to complete from time of application	→	Project must complete and be submitted by November 30, 2012
Any new windows accepted	→	New windows must be ENERGY STAR qualified (not incentivized)
No combustion safety test	→	Mass Save Verifier must conduct a post-construction combustion safety test.

<sup>2</sup> Provided by Greg Krantz, ICF.

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CURRENT DESIGN		NEW DESIGN
Mechanical ventilation must be installed and set to ASHRAE 62.2 ventilation rates	→	Mechanical ventilation must be installed and set to ASHRAE 62.2 ventilation rates only if the house is tighter than .35 ACHn.
Incentives calculated from receipts	→	Incentives based on industry averages
Homeowner registered project	→	Homeowner fills out application. Mass Save verifier submits project information.
Full Rem/Rate detailed energy modeling	→	Simplified BEACON input spreadsheet
House types undefined	→	Single family detached homes and attached housing of 2 to 4 units.
No insulation installation requirement	→	Insulation must be installed to grade 1 or 2 standards where applicable
Up to \$2,000 in total rebates	→	<p>75% incentive up to \$2,000 in rebates for insulation plus rebates for air sealing. The air sealing bonus is directly tied to the reduction in air infiltration and is calculated by subtracting the post-construction blower door results (in CFM50) from the pre-construction blower door results. The amount of the incentive is \$1.06 per CFM50 reduction. There is no cap on this air sealing bonus.</p> <p>In cases where construction has already started and it is not possible to get pre-construction air infiltration numbers, a flat rate of \$0.42 per square foot of conditioned floor area will be paid to the homeowner for air sealing measures provided they meet the prescriptive program requirements for air sealing. The \$0.42 per square foot of conditioned floor area was taken from the NREL National Residential Efficiency Measures Database and is the average rate for sealing to a 25% Leakage Reduction. There is a \$1,000 cap on this bonus.</p>

**Attachment II:**  
**2012 Major Renovations Pilot Program Brochure**



# MASSACHUSETTS NEW HOMES WITH ENERGY STAR®



The Major Renovations Pilot Program is sponsored by Cape Light Compact, National Grid Electric, NSTAR Electric, and Western Massachusetts Electric Company.

## 2012 MAJOR RENOVATIONS PILOT PROGRAM OVERVIEW

The Major Renovations Pilot Program, an affiliate program to the Massachusetts New Homes with ENERGY STAR® program, provides incentives to contractors who are partially gutting and renovating a home, or building an addition, to increase the energy performance of the home.

### Technical Support

- An initial assessment will be provided to identify upgrade opportunities as well as support for implementation.
- Onsite inspections will occur with the insulation and other contractors during key phases of the construction process to ensure the project meets efficiency goals.

### Financial Incentives

- Up to \$2,000 in energy efficient upgrades are available plus additional incentives for air sealing. Rebates for high efficiency heating, cooling, and water heating equipment are also available through Mass Save®
- The Program, through independent Mass Save verifiers, will help identify additional rebates and incentives available to participants.

### Compact Fluorescent Lighting at No Cost

- A wide range of screw-in compact fluorescent lamps (CFL)s for appropriate fixtures in the home will be provided at no cost.

## Project Requirements

### EXISTING AREAS

- Any new windows must be ENERGY STAR® qualified, having a U factor  $\leq .30$ .
- Seal the accessible ductwork in unconditioned space using mastic and insulate to code requirements: Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

**Exterior Walls** – Any empty wall cavities must be filled with insulation that meets or exceeds an R value of R-3.2/inch.

**Flat Attic Ceilings** – Seal all air leakage locations including all accessible top plates. Install loose blown insulation to achieve a minimum insulation level of R-38, or completely fills the cavity and meets or exceeds an R value of R-3.2/inch

### Basement/Crawl Space –

- Insulate unfinished basement/crawl space walls with a code approved insulation with a minimum of R-10 continuous or R-13 cavity insulation. Insulate sill perimeter with R 19 blockers. –OR–

- Insulate the unfinished basement/crawl space ceiling with insulation that:

- Is installed to RESNET (Residential Energy Services Network) defined grade I or grade II standards – AND –
- Either meets or exceeds an R value of R-30, or completely fills the joist bay with insulation that meets or exceeds an R value of R-3.2/inch.

### GUTTED AREAS

Gutted areas must comply with sections 3 and 5 of the ENERGY STAR® Thermal Enclosure System Rater Checklist, excluding the foam sill gasket requirement of section 5.2.1.

- Any new windows must be ENERGY STAR® qualified, having a U factor  $\leq .30$ .
- Seal the accessible ductwork in unconditioned space using mastic and insulate to code requirements: Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

**Exterior Walls and Vaulted Ceilings** – Any exposed cavities must be filled with insulation that meets or exceeds an R value of R-13 for 2x4 walls and R-21 for 2x6 walls. Other wall cavities must be filled with insulation that meets or exceeds an R value of R-3.2/inch. Insulation must be installed to RESNET defined grade I or grade II standards.

**Flat Attic Ceilings** – Install loose blown insulation to achieve R-38 minimum insulation level, or completely fills the cavity and meets or exceeds an R value of R-3.2/inch installed to RESNET defined grade I or grade II standards.

## NEW CONSTRUCTION

Newly constructed areas must meet the 2009 IECC prescriptive requirements from table 402.1.1, including R-30 basement ceilings, R-20 walls, and R-38 attic ceilings. The following additional requirements must be met:

- The project must meet sections 3 and 5 of the ENERGY STAR® Thermal Enclosure System Rater Checklist
- Insulation must be installed to RESNET defined grade I or grade II standards.
- Sealed Ductwork– Completely new duct systems must be tested at  $\leq 4$ cfm per 100 sf of floor area to the outside.
- Windows must be ENERGY STAR® qualified, having a U factor  $\leq .30$ .

## MECHANICAL SYSTEMS

**HVAC** – New heating, air conditioning and water heating equipment must all be ENERGY STAR® qualified.

**Thermostat** – Must be ENERGY STAR® qualified

**Ventilation** –

- A BPI (Building Performance Institute) or RESNET combustion safety test must be performed by the Mass Save verifier if there are any naturally or induced draft mechanical equipment (i.e. non-sealed combustion located inside the building envelope).
- Homes with infiltration rates less than 0.25 ACHn must install a program approved ventilation device (see below) with the flow rate set to at least  $0.01 \times CFA + 7.5 \times (Nbr+1)$  where: CFA =

**Basement/Crawl Space** –

- Insulated basement/crawl space walls with a code approved insulation installation with a minimum of R-10 continuous or R-13 cavity. Insulate sill perimeter with R 19 blockers. –OR–
- Insulate the basement/crawl space ceiling with insulation that:
  - ♦ Is installed to RESNET defined grade I or grade II standards – AND –
  - ♦ Either meets or exceeds an R value of R-30, or fills the joist bay and meets or exceeds an R value of R-3.2/inch.

conditioned floor area and Nbr = number of bedrooms. The permanent flow rate shall NOT exceed the required flow rate by more than 20 percent on any home.

- Program approved mechanical ventilation devices:
  - ♦ A bath fan rated for continuous use at  $< 1.5$  sones and controlled by a 24-hour programmable timer OR
  - ♦ One whole house mechanical ventilation system (includes an ERV or HRV) OR
  - ♦ A balanced supply and exhaust system without heat recovery OR
  - ♦ A multi-port exhausts only system with a remote mounted fan

***Home inspections are mandatory, as described on the Application.***

# 2012 MAJOR RENOVATIONS PILOT PROGRAM PARTICIPATION

## Qualification Requirements

Must have a renovation that includes gutted portions of the house and/or any size addition.

- The following mandatory inspections must be scheduled by the participant and completed by the Mass Save verifier. Contact the Mass Save verifier at the times indicated below.
  1. A pre-construction assessment of the existing home. Homes that have started construction are still eligible to participate.
  2. An insulation inspection must be conducted after the insulation and air sealing are complete and prior to the start of the wallboard installation. If you have a new duct system, it should be tested at this time, prior to the wallboard installation.
  3. Toward the end of the shell completion of the project and once the HVAC systems are installed if applicable, a final inspection must be scheduled. This includes blower door testing and the installation of energy-efficient light bulbs.

## Incentives

Building envelope upgrades are incentivized on a per square foot basis. Upgrades to the unrenovated portions of a home are incentivized differently than gutted and new portions. Please refer to the incentive worksheet for specific incentives.

The envelope upgrade incentives are capped at \$2,000 per legal residence plus additional incentives for air sealing. All projects must complete and be submitted to the program by the Mass Save Verifier before November 30, 2012 in order to receive incentives.

## Mass Save Verifier Incentive

In addition to the incentives mentioned above, the Program will also pay a \$300 incentive to the Mass Save verifier for reporting information to the Program with a \$200 bonus for early reporting. This incentive is paid directly to the Mass Save verifier the participant hires for their project, at the successful completion of the project. This fee is only paid to Mass Save verifiers registered to work with the Major Renovations Pilot Program. Please be aware that each Mass Save verifying company is a private company with its own pricing structure. The fees charged by the Mass Save verifier are in no way fixed by the Program. As with any other subcontractor, the fee the Mass Save verifier charges can be affected by the size and complexity of the project, amount of consulting work required, travel time, etc.

## Additional Rebates

Participants in the Major Renovation Pilot Program are eligible to receive additional incentives through Mass Save, such as incentives for energy efficient heating, cooling and water heating equipment. Participants must apply for these additional rebates separately if they choose to do so, they will not be processed through the Major Renovations Program and are subject to the terms and conditions set forth by each program. Please visit [MassSave.com](http://MassSave.com) to learn about additional rebates. Participants in the Major Renovations Pilot Program will not be eligible for the Home Energy Services Program (Home Energy Assessment) or affiliated programs in the same calendar year.

## How to Participate

1. Consult the Program for information and pre-qualification, and to obtain a list of Mass Save verifiers registered to work with the Program.
2. Fill out the application below.
3. Hire a certified Mass Save verifier who will enroll your project, review plans and advise on appropriate inspection times. The Mass Save verifier will submit for incentives on the participant's behalf.

**YOUR PROJECT MUST BE SUBMITTED TO THE PROGRAM BY A MASS SAVE VERIFIER IN ORDER TO OFFICIALLY ENROLL AND RECEIVE INCENTIVES.**

## 2012 MAJOR RENOVATIONS PILOT PROGRAM APPLICATION

Applicant/Incentive Recipient:	Applicant Company (if applicable):	
Mailing Address (include city, state, zip):	Phone:	Email:
Applicant Contact:	Mass Save Verifier Company Name:	
Please Circle All That Apply:    Single Family    Multi-Family	Heating Fuel Type:	
Electric Service Provider :	Estimated # of Units to Complete by 11/30/12:	
Electric Account #:		
<p><b>Incentive Guidelines</b></p> <ul style="list-style-type: none"> <li>The submission of this Application does not guarantee receipt of incentives. Written approval from the Program will state the number of incentives awarded, incentives will not be paid prior to home testing and verification.</li> <li>The incentives awarded are to assist in the defrayment of certification cost to the applicant and help cover some of the incremental costs, if applicable. The applicant may need to contribute to the construction costs to meet the program defined performance requirements. Sponsors pay the Mass Save Verifier Company a fixed certification incentive for verifying a home earns the program performance requirements. Any certification fee balance is the sole responsibility of the Participant and should be paid directly to the Mass Save Verifying Company.</li> <li>Participating homes must be located in the service territory of Cape Light Compact, National Grid Electric, NSTAR Electric, or Western Massachusetts Electric Company, as evidenced by town, zip code and, ultimately, a permanent electric meter number.</li> </ul>	<ul style="list-style-type: none"> <li>SPONSORS, ITS AGENTS, AND EMPLOYEES DO NOT WARRANT THE PERFORMANCE OF INSTALLED OR SERVICED EQUIPMENT EXPRESSLY OR IMPLICITLY. Program sponsors make no warranties or representation of any kind whether statutory, expressed or implied, including without limitations, warranties or merchantability or fitness for a particular purpose regarding the HVAC equipment or services provided by a manufacturer or vendor. Contact your contractor for details regarding equipment performance or warranties.</li> <li>Participation in the Major Renovations Pilot Program is voluntary on behalf of the Sponsors and the applicants. The Sponsors have the right to change or modify the existing Program at any time. The Sponsors of the Program, its agents, and employees are indemnified against all loss, damage, expense, and liability resulting from injury to or death of persons, and against all injury to property arising out of or in any way connected with the performance of this Agreement.</li> <li>The Energy Efficiency Program Provider (EEPP) is entitled to 100% of the energy benefits associated with the Energy Cost Measurements, excluding the value of energy cost savings realized by the customer, but including all rights to all associated ISO-NE Energy Capacity and Reserves Products, and the customer agrees to provide the EEPP with such further documentation as the EEPP may request to confirm the EEPP's ownership of such benefits and products.</li> </ul>	
Applicant Signature:	Date:	

Please submit application by mail, fax or email to:

**MAJOR RENOVATIONS PROGRAM**  
 c/o ICF International  
 33 Hayden Avenue, 3<sup>rd</sup> Floor  
 Lexington, MA 02421  
[majorreno@icfi.com](mailto:majorreno@icfi.com)  
 1.800.628.8413 (t) | 781.676.4061 (f)

