



## The Evolution Continues

2012 ACI National Home Performance Conference  
Baltimore, Maryland

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## Session Agenda

1. **Update on the HPwES Program**
2. **Challenges**
3. **Designing for a More Scalable Future**
4. **Defining a HPwES "Pathway"**
  - Workforce and Certification Criteria
  - Creating a Basic Retrofit Definition
  - Home Assessment and QA Requirements
  - Recognition Strategies
5. **Expanding and Strengthening Industry Program Participants**
  - Expanding Sponsorship Types and Opportunities
  - Charter Contractors
6. **Next Steps and Gathering Input**
7. **Appendices**

## What is Home Performance with ENERGY STAR?

- National voluntary program administered by the U.S. DOE in conjunction with the U.S. EPA
- Whole-house approach to improving energy efficiency and comfort, while helping to protect the environment
- Comprehensive recommendations by qualified contractors backed by third-party quality assurance when the work is complete
- Since 2002, HPwES Programs have been locally sponsored by utilities, state energy offices, energy NGOs, and financial institutions



## Update on HPwES Program

## HPwES Is Ten Years Old!

- We have a strong partnership base with over 50 Sponsors in 34 states, including DC
- The home performance industry is growing across the nation with over 1,800 participating contractors



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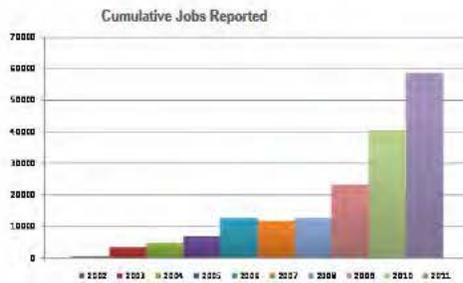
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## We're Making Progress!

- We've reached nearly 200,000 homes with HPwES improvements
- Average energy retrofit investment hovers around \$9,000<sup>1</sup> but varies widely
- Almost \$2 billion invested in home energy retrofits under the HPwES program to date<sup>2</sup>



(1) Joint Center for Housing Studies of Harvard University (JCHS), *Improving America's Housing 2007: Foundations for Future Growth in the Remodeling Industry* (2007)

(2) 200,000 retrofitted homes times \$9,000 average retrofit cost equals \$1.8 billion

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## Status of the National HPwES Program

DOE began administering HPwES program in October 2011



- Established Account Managers
  - ✓ Supporting access to the national Program
  - ✓ Fostering regional coordination among Sponsors
- Initiated greater coordination with DOE resources including:
  - ✓ Workforce Guidelines
  - ✓ Better Buildings Neighborhood Program
  - ✓ Home Energy Score
  - ✓ Building America Program

We will continue to use the HPwES brand and logo in perpetuity

DOE and EPA continue to collaborate to offer a national platform to support this emerging industry and market



## Challenges





## Designing for a More Scalable Future

## Anticipated Timeline of HPwES Enhancements

| October 2011   | March 2012   | June/July 2012  | Early Fall 2012  | Fall/Winter 2012  | Summer 2013   | January 2014   |
|--|--|---|--|---|---|--|
| <ul style="list-style-type: none"> <li>HPwES transfers to DOE</li> <li>Evaluate current HPwES design</li> <li>Obtain feedback on HPwES v2</li> </ul> | <ul style="list-style-type: none"> <li>Present HPwES v2 concept at ACI 2012</li> <li>Start of 60 day comment period</li> </ul> | <ul style="list-style-type: none"> <li>Revise HPwES v2 to incorporate comments</li> <li>Develop draft program requirements</li> </ul> | <ul style="list-style-type: none"> <li>Release HPwES v2 program requirements for public comment</li> <li>Start of 30 to 45 day comment period</li> </ul> | <ul style="list-style-type: none"> <li>Set up limited set of Sponsor pilots to test HPwES v2</li> <li>Set up limited set of Charter Contractor pilots</li> <li>Sponsors review program requirements to determine needs for changes</li> </ul> | <ul style="list-style-type: none"> <li>Complete pilots</li> <li>Release final HPwES v2 program requirements</li> <li>Sponsors begin transition to v2</li> </ul> | <ul style="list-style-type: none"> <li>All Sponsors &amp; Contractors must comply with HPwES v2 program changes</li> </ul> |

Ongoing – Support to Sponsors & Contractors to assist with program revisions; DOE recruits new Sponsors and Contractors

## Anticipated Timeline of HPwES Enhancements

| January 2014   | 2015  | 2016  | 2017  |
|--|---|---|---|
| <ul style="list-style-type: none"> <li>All Sponsors &amp; Contractors must comply with HPwES v2 program changes</li> </ul> | <ul style="list-style-type: none"> <li>Review HPwES v2 implementation</li> <li>Adopt performance path</li> <li>Consider adoption of DOE workforce certifications</li> </ul> | <ul style="list-style-type: none"> <li>Propose revisions to HPwES v2 to industry</li> </ul> | <ul style="list-style-type: none"> <li>Launch HPwES v3</li> </ul> |

Ongoing – Support to Sponsors & Contractors to assist with program revisions; DOE recruits new Sponsors and Contractors

## Proposed Program Solutions

- Define a comprehensive, scalable, national HPwES Program with clear, consistent expectations of how a home will be improved
- Encourage program participation through additional entry points along a pathway to deeper whole-house retrofits
- Ensure quality delivery of both energy savings and health & safety protocols
- Leverage additional industry participants
  - Permit non-traditional sponsorship types
  - Design a new program component to accommodate qualified contractors operating where Sponsors do not currently exist
- Streamline/improve resources, including recognition
- Optimize leveraging of other DOE programs and resources

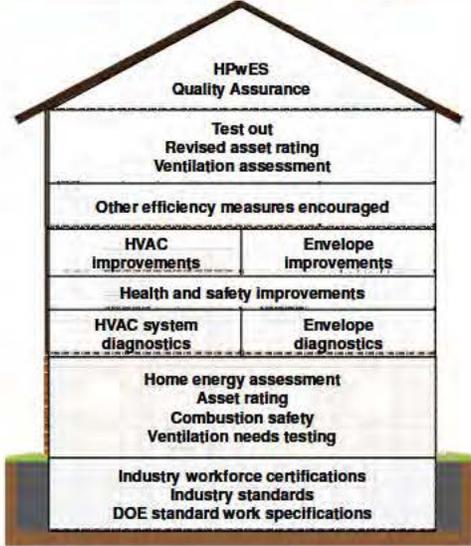


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## Defining a HPwES “Pathway”

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## Proposed Retrofit Definition



The diagram shows a house with a gabled roof. The interior is divided into several horizontal sections representing different retrofit components:

- HPwES Quality Assurance** (at the roofline)
- Test out**  
Revised asset rating  
Ventilation assessment
- Other efficiency measures encouraged**
- HVAC Improvements** (left side) and **Envelope Improvements** (right side)
- Health and safety improvements**
- HVAC system diagnostics** (left side) and **Envelope diagnostics** (right side)
- Home energy assessment**  
Asset rating  
Combustion safety  
Ventilation needs testing
- Industry workforce certifications**  
Industry standards  
DOE standard work specifications

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## Proposed Retrofit Definition



Industry workforce certifications  
 Industry standards  
 DOE standard work specifications

**Individuals conducting assessment, overseeing work, & conducting test-out shall possess a whole-house, building science-focused certification from ANSI (or equivalent accredited body) or DOE-approved certification body**

**All assessment protocols and measures installed shall comply with Standard Work Specifications of DOE Workforce Guidelines or other DOE-approved, consensus-based, industry developed standards that provide valid & reliable results**



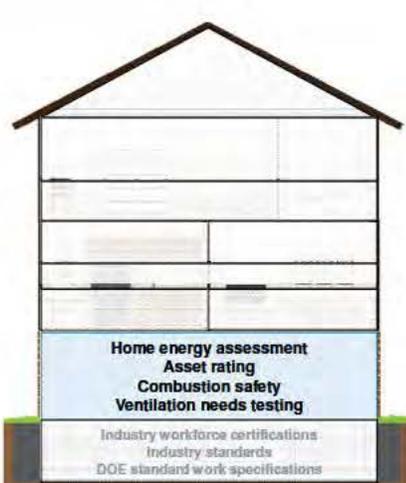
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## Proposed Retrofit Definition



Home energy assessment  
 Asset rating  
 Combustion safety  
 Ventilation needs testing

Industry workforce certifications  
 Industry standards  
 DOE standard work specifications

**Conduct Home Energy Score assessment & rating (or equivalent)**

**Evaluate combustion appliances for safe operation**

**Determine ventilation needs (ASHRAE 62.2-2010)**



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## Proposed Retrofit Definition

**Perform system load & sizing analysis or specify plan for multistage/ variable-speed system**

**Evaluate system airflow, temperatures, static pressures, refrigerant charge, etc.**

**Assess distribution system for design, sizing, conductive losses, & leakage**

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## Proposed Retrofit Definition

**Ensure adequate mechanical ventilation (ASHRAE 62.2-2010)**

**Adequately address moisture issues**

**Address combustion safety issues**

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## Proposed Retrofit Definition

| Base-Level  | Recognition-Level  |
|---|--|
| <p><b>Equipment retro-commissioning (comprehensive tune-up)</b></p> | <p><b>Quality design &amp; installation of control systems &amp; ENERGY STAR equipment</b></p> |
| <p><b>Sealed, insulated, &amp; balanced distribution system</b></p> | <p><b>Sealed, insulated, &amp; balanced distribution system</b></p>                            |

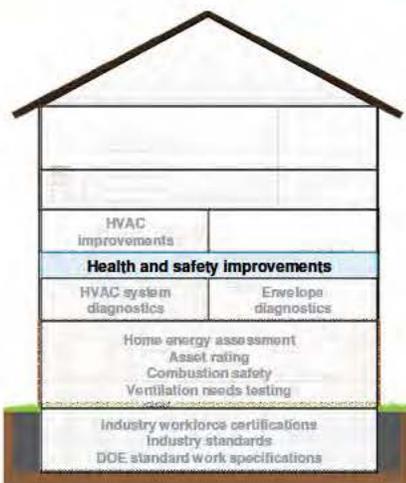
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## Proposed Retrofit Definition

|  |
|--|
| <p><b>Perform thermal imaging [recognition-level only]</b></p> |
| <p><b>Evaluate windows &amp; doors</b></p>                     |
| <p><b>Evaluate thermal &amp; pressure boundary</b></p>         |
| <p><b>Perform blower door test</b></p>                         |
| <p><b>Evaluate moisture issues</b></p>                         |

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## Proposed Retrofit Definition



**Ensure adequate mechanical ventilation (ASHRAE 62.2-2010)**

**Adequately address moisture issues**

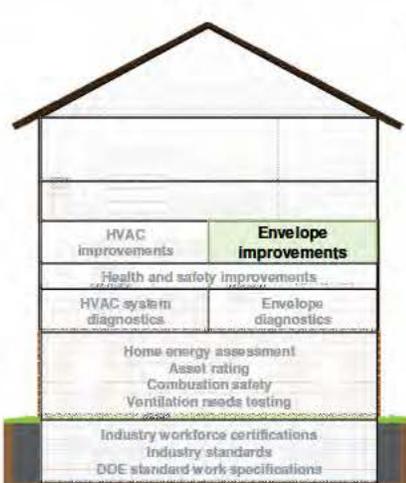
**Address combustion safety issues**

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## Proposed Retrofit Definition



**Base-Level**

**Apply IECC 2009 attic insulation levels to the limits of construction**

**Achieve a 25% air leakage reduction or follow the ENERGY STAR Thermal Enclosure System Rater Checklist for all accessible areas**

**Recognition -Level**

**IECC 2012 attic insulation**

**Upgrade to ENERGY STAR windows or low-E storm windows when single-pane windows exist**

**Cavity-filled wall insulation or R13 continuous insulation**

**IECC 2012 crawl space & basement insulation**

**7 ACH50 and the ENERGYSTAR Thermal Enclosure System Rater Checklist for all accessible areas**

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## Proposed Retrofit Definition

The diagram shows a house with four main layers of retrofit measures:

- Top Layer:** Other efficiency measures encouraged
- Second Layer:** HVAC improvements, Envelope improvements
- Third Layer:** Health and safety improvements
- Fourth Layer:** HVAC system diagnostics, Envelope diagnostics
- Fifth Layer:** Home energy assessment, Asset rating, Combustion safety, Ventilation needs testing
- Bottom Layer:** Industry workforce certifications, Industry standards, DOE standard work specifications

**Other efficiency measures encouraged**

- Domestic water heating
- ENERGY STAR windows & doors
- Semi-permanent ENERGY STAR appliances
- ENERGY STAR lighting fixtures
- Energy control systems
- Solar shading
- Renewable energy
- Other

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## Proposed Retrofit Definition

The diagram shows a house with five main layers of retrofit measures:

- Top Layer:** Test out Revised asset rating Ventilation assessment
- Second Layer:** Other efficiency measures encouraged
- Third Layer:** HVAC improvements, Envelope improvements
- Fourth Layer:** Health and safety improvements
- Fifth Layer:** HVAC system diagnostics, Envelope diagnostics
- Sixth Layer:** Home energy assessment, Asset rating, Combustion safety, Ventilation needs testing
- Bottom Layer:** Industry workforce certifications, Industry standards, DOE standard work specifications

- Perform diagnostic testing to ensure all installed measures provide intended effects
- Visually inspect to ensure all measures are installed according to required specifications and standards
- Verification of mechanical ventilation (ASHRAE 62.2 compliance)
- Evaluate combustion appliances for safety
- Revise Asset Rating

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## Proposed Retrofit Definition

- Diagnostic testing to ensure all installed measures provide intended effects
- Visual inspection to ensure all measures are installed according to required specifications and standards
- Verification of mechanical ventilation (ASHRAE 62.2 compliance)
- Evaluation of combustion appliances for safety
- Tiered Field Inspection Requirements
 

| Tiered Inspection Sampling Rates |                           |  |
|----------------------------------|---------------------------|--|
| Project Experience               | Participating Contractors | Charter Contractors/ Recognition-Level |
| First 10 retrofits               | 50%                       | 50%                                    |
| Next 20 retrofits                | 20%                       | 20%                                    |
| > 30 retrofits                   | 5%                        | 15%                                    |
- Customer interview to ensure satisfaction

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## Recognition Level Strategies

DOE is considering the following alternatives for recognizing home performance improvements:

| Option 1   | Option 2  | Option 3  |
|--|---|---|
| <ul style="list-style-type: none"> <li>✓ HVAC System</li> <li>✓ Envelope System</li> </ul>                           | <ul style="list-style-type: none"> <li>✓ Whole House</li> <li>✓ HVAC System</li> <li>✓ Envelope System</li> </ul> | <ul style="list-style-type: none"> <li>✓ Whole House</li> </ul>               |
| <p>Recognize only comprehensive system improvements (i.e., <u>HVAC System</u> and/or the <u>Envelope System</u>)</p> | <p>Recognize when <u>both</u> the HVAC and Envelope Systems are improved</p>                                      | <p>Recognize <u>comprehensive whole house</u> assessment and improvements</p> |

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## Expanding and Strengthening Industry Program Participants

## Current Roles of Industry Program Participants

### Sponsors

#### Design and Administer Local Programs

- ✓ Adhere to HPwES Program minimum requirements
- ✓ Market the HPwES brand
- ✓ Recruit, train, manage, and QA participating contractors
- ✓ If desired, assess homes and install HP measures
- ✓ Track and report HPwES improvements to DOE
- ✓ Offer incentives and financing
- ✓ Collaborate with DOE to strengthen the HP industry

### Contractors

#### Provide HP Services

- ✓ Adhere to Sponsor and HPwES Program minimum requirements
- ✓ Get trained and certified
- ✓ Assess homes (whole house or systems)
- ✓ Install HP measures
- ✓ Conduct QC on retrofits
- ✓ Market the HPwES brand
- ✓ Track and report HPwES improvements to Sponsors
- ✓ Offer incentives and/or financing
- ✓ Collaborate with Sponsors

## Expanding and Strengthening Sponsor Base

- With a new energy retrofit definition, Sponsors will be able to administer along a pathway
  - Enabling more consistency between local programs (brand use, workforce guidelines, QA, reporting, etc.)
  - Maintaining flexibility to build customized local programs (marketing, training, incentives, etc.)
- Non-traditional Sponsors (limited at first) will expand the reach of HPwES to attract lenders, retailers, manufacturers, etc.



HPwES will have greater value along the full chain of homeowner decision making related to owning a home

## Key Changes for Program Sponsors

- Must implement local programs according to the new HPwES Program minimum retrofit definition and perform QA on reported contractor activity under the entire definition
- Use the HPwES brand (but according to logo use requirements)
- Comply with additional data reporting requirements
- Provide a Completion Certificate to all homes meeting at least the base retrofit definition
- Able to offer a new HPwES recognition level on qualified homes
- Must prepare an annual Implementation Plan Update, including a summary of major accomplishments of their program
- Additional Sponsor types will be permitted into the national Program, including retailers, lenders, associations, etc.
- Must follow guidance about overlapping Sponsors and Charter Contractors

## Expanding and Strengthening Contractor Base

- With a new energy retrofit definition, there will be additional entry points for contractor participants
  - Including HVAC contractors, insulation contractors, and possibly retailers and others
  - Raising the bar with respect to the quality and health & safety of HVAC and insulation services for these “new” participants
- Existing HP contractors will have increased access to much needed qualified HVAC contractors
- Charter Contractors *will* expand HPwES into areas without Sponsors



Contractors will help homeowners get on the pathway to an energy efficient, comfortable, and healthy house

## Charter Contractors

- “Sponsorless” endeavors need to be based on contractor business capabilities and not geographical area
  - Work with Charter Contractors to fill gaps in the Program
- A limited number of trade contractors will be permitted to join the Program each year and operate generally where no Sponsors exist
- Anticipated Charter Contractor requirements include:
  - Work with HPwES to fill gaps in the Program
  - Must follow new HPwES Program minimum retrofit definition as required by DOE
  - More stringent Program criteria will need to be met by Charter Contractors (TBD but likely to address the size of the company, years in the business, etc.)
- Must follow guidance about overlapping Sponsors and Charter Contractors
  - Use the HPwES brand (but according to logo use requirements)
  - Able to offer HPwES Completion Certificate and a higher recognition for qualified homes

## Key Changes for Participating Contractors

- Must comply with new DOE requirements for the home assessment, measure installation and quality control criteria
- Must follow new HPwES Program minimum retrofit definition as required by DOE and adopted by individual Sponsors, as well as other requirements of local Sponsors
- Use the HPwES brand (according to logo use requirements)
- Able to offer HPwES Completion Certificate and a higher recognition for qualified homes

## Striking a Balance

### National / Regional Consistency

#### Brand Use

- ✓ Required use of the HPwES brand in marketing to consumers

#### Work & Workforce

- ✓ Minimum requirements for how to do work and what work to do
- ✓ Minimum requirements for national / regional worker certifications
- ✓ New workers must be mentored

#### Assessment

- ✓ Minimum requirements for initial assessment that must result in asset rating provided to homeowner

#### Quality Assurance

- ✓ Minimum sampling protocols
- ✓ Minimum standards for conducting field inspection

#### Data / Reporting

- ✓ All reporting shall be consistent with HPXML

### Sponsor / Contractor Flexibility

#### Brand Use

- ✓ In compliance with ENERGY STAR guidelines, Sponsors and Contractors can decide how to incorporate HPwES into marketing

#### Work & Workforce

- ✓ Sponsors can require specialty certifications
- ✓ Sponsors can require work to exceed the HPwES minimum retrofit definition

#### Assessment

- ✓ Reduction of requirements for initial assessment
- ✓ Diagnostics can be done during assessment or retrofit

#### Quality Assurance

- ✓ Sponsors can exceed minimum protocols and standards

#### Data / Reporting

- ✓ Sponsors can choose project management and energy modeling software suitable for their program



## Next Steps and Gathering Input

## Next Steps and Providing Comments

**March 28, 2012 DOE will launch a 60- day comment**

Go to <http://buildingamerica.pnl.gov> to provide comments

### How it works

- Requires only a valid email address to register & create a user name
- You can view this entire presentation and Appendices to review and make comments online
- The comment tool includes a FAQ to answer questions
  - about special formatting options for comments
  - ability to search for specific sections

## Thank You

### Overall

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## Evolving HPwES Appendices

## DOE Home Performance with Energy Star Version 2 (HPwES v2) Request for Comments

DOE's proposed program re-design uses the following criteria for HPwES Version 2, as summarized in the presentation "Home Performance with Energy Star: The Evolution Continues, 2012 ACI National Home Performance Conference." <http://buildingamerica.pnl.gov>

To make this commenting process as useful as possible, commenters should review this presentation - found in the "sticky" - prior to responding to this Request for Comments. Please use the ***Building America Document Review Tool*** to submit comments by 5 PM Eastern ***Thursday, May 31, 2012***.

The Program is soliciting comments on the following criteria, suggestions for alternative criteria and approaches, and recommendations for additional criteria and references to be included. The Program is interested in your feedback on proposed criteria. Your feedback, whether negative or positive toward specific elements of the proposed program design, is extremely valuable. If climate-specific criteria are critical, the Program is interested to receive input as to how the criteria should be modified. Several questions are also posed below for which the Program would like industry to provide feedback.

### 1. General Program Design

- 1.1. DOE's proposed redesign of the HPwES Program requires compliance with a set of minimum performance criteria rather than focusing on whole-building percentage energy savings. It is the Program's view that incentives based on percent energy savings can be overlaid on top of these minimum criteria.
- 1.2. The proposed program design will encourage broader participation in the program by offering an HVAC track and an Envelope track that may be applied independently or combined under the Program.
- 1.3. The proposed program design uses a pathway approach by creating a base level of minimum performance criteria and a recognition level in the proposed design including more aggressive and advanced energy efficiency improvements.
- 1.4. The program is interested in comments and feedback describing how these changes might impact local program sponsors and to better understand local statutory, regulatory, or other issues that may impact the successful implementation of these changes.

### 2. Industry Workforce Certifications, Industry Standards, and DOE Standard Work Specifications

- 2.1. The proposed program design requires DOE Workforce Certifications by CY 2015.
- 2.2. The proposed program design requires a Home Energy Score (or equivalent as determined by DOE) asset rating pre- and post-retrofit for HPwES projects.
- 2.3. The proposed program design may require an IR certification by the individual who is performing an assessment for the purposes of achieving the recognition-level envelope improvements.
- 2.4. The proposed program design requires compliance with ASHRAE 62.2 for ventilation minimums. The Program is seeking feedback on whether or not the ASHRAE 62.2 standard should be required in its entirety.
- 2.5. The proposed program design will use the ENERGY STAR Thermal Enclosure Rater Checklist (Section 5. Air Sealing) as a base reference for air sealing minimum requirements (within the constraints of the existing construction and accessibility.)

### 3. HVAC Diagnostics

- 3.1. Which diagnostic tests, if any, should be mandatory during the initial assessment? Keep in mind that relevant diagnostics are still required in conjunction with the measure installations, but HPwES is interested in when those diagnostic tests must be done.
  - 3.2. What is the minimum amount of testing necessary to adequately determine what duct repair is needed and to validate that the work has been properly completed?
  - 3.3. Are there regional variations driven by climate and/or local construction practices to be considered in the selection of mandatory diagnostic tests?
  - 3.4. What methods of system airflow testing should be allowable?
  - 3.5. What methods of duct leakage testing should be allowable?
4. HVAC Base-Level Improvements
- 4.1. The proposed program design requires that distribution systems are sealed and insulated. Insulation minimums would be consistent with IECC 2009 for the base level.
  - 4.2. What requirements regarding sealing, insulating, and balancing inaccessible ducts are reasonable to include in the program design?
  - 4.3. The proposed program design requires that heating/cooling duct systems are pressure and/or airflow balanced. The program is seeking suggestions for existing standards that can be referenced and feedback on what level of level of pressure and airflow balancing can reasonably be expected in existing homes.
  - 4.4. The proposed program design may offer a HPwES Completion Certificate on retrofits that cannot comply with all the HVAC base-level criteria (due to the limitations of construction and/or being cost-prohibitive) but decreases a home's energy use by at least 10% as estimated using Home Energy Score (or equivalent.)
5. HVAC Recognition-Level Improvements
- 5.1. The proposed program design may allow alternative load and sizing analysis options including the possibility of installing multistage equipment in anticipation of potential future envelope improvements. Since IECC 2009 requires Manual J, the Program is evaluating the impact of specifying multistage equipment as an alternative.
  - 5.2. The proposed program design may make multistage equipment mandatory if envelope improvements have not been addressed adequately.
  - 5.3. For the Manual J option, should the analysis be "whole-house", "block" load or "room-by-room" loads? Is Manual J alone sufficient or should Manuals S and D also be required for sizing and duct design? What adaptations are necessary for these manuals to be applied to existing buildings?
  - 5.4. If the proposed program design allows for "Manual J or equivalent load analysis," what are the options for credible equivalent tools?
  - 5.5. The Program does not anticipate the multistage equipment option to create problems with system airflows, static pressures, capacity, efficiency or other performance metrics when matched with existing undersized or oversized ductwork (that will not be replaced.) Will there be potential issues and, if so, what are workable solutions?
  - 5.6. The proposed program design may allow non-ENERGY STAR heating equipment in certain southern climate zones and non-ENERGY STAR cooling equipment in certain northern climate zones, perhaps aligning with ENERGY STAR homes regional heating equipment criteria. However, ENERGY STAR heating equipment may be required regardless of climate zone for combustion safety reasons. The Program is interested in industry's opinion on this approach.
  - 5.7. The proposed program design may require that distribution systems are sealed and insulated to IECC 2012 levels for recognition level improvements.

- 5.8. The Program is interested in industry feedback related to the concept of tradeoffs within the HVAC and envelope pathways if barriers exist that prohibit meeting the criteria outlined in the pathways for the purposes of system-based recognition levels
- 5.9. The Program is interested in industry feedback related to the concept of tradeoffs between the HVAC and envelope pathways if barriers exist that prohibit meeting the criteria outlined in the pathways for the purposes of a whole-house recognition level.

## 6. Envelope Diagnostics

- 6.1. Which diagnostic tests, if any, should be mandatory during the initial assessment? Keep in mind that relevant diagnostics are still required in conjunction with the measure installations, but HPwES is interested in when those diagnostic tests must be done.
- 6.2. Are there regional variations driven by climate and/or local construction practices to be considered?
- 6.3. The Program is considering requiring IR certification to conduct thermal imaging for purposes of verifying cavity-filled walls to achieve the envelope recognition-level.

## 7. Envelope Base-Level Improvements

- 7.1. Should base-level also include requirements for insulation in locations such as band joists, crawl space, and other areas to the limits of construction (keeping in mind that the intent is not to make the base-level too complicated or expensive)?
- 7.2. The proposed program design may require minimum attic insulation levels consistent with IECC 2009 for the base level improvements (within the constraints of construction.) For attics, this would require 100% of open/accessible attic spaces or a minimum of 75% of the total reflected footprint of the living space to meet these insulation levels as described in HUD's Power Saver Loan specifications.
- 7.3. The proposed program design may offer a HPwES Completion Certificate on retrofits that cannot comply with all the Envelope base-level criteria (do to the limitations of construction and/or being cost-prohibitive) but decreases a home's energy use by 10% as estimated using Home Energy Score (or equivalent.)

## 8. Envelope Recognition-Level Improvements

- 8.1. The proposed program design may require minimum attic, basement, and crawlspace insulation levels consistent with IECC 2012 for the recognition level improvements (within the constraints of construction.) For attics, this would require 100% of open/accessible attic spaces to and a minimum of 75% of the total reflected footprint of the living space to meet these insulation levels as described in HUD's Power Saver Loan specifications.
- 8.2. The Program is interested in industry feedback related to the concept of tradeoffs within the HVAC and envelope pathways if barriers exist that prohibit meeting the criteria outlined in the pathways for the purposes of system-based recognition levels
- 8.3. The Program is interested in industry feedback related to the concept of tradeoffs between the HVAC and envelope pathways if barriers exist that prohibit meeting the criteria outlined in the pathways for the purposes of a whole-house recognition level.

## 9. Health & Safety Improvements

- 9.1. The proposed program design may require mechanical ventilation (according to ASHRAE 62.2-2010) regardless of the leakiness of the house. How should the program interpret ASHRAE 62.2-2010 in regards to mechanical/controlled ventilation requirements (e.g., just install it and

homeowners operate it vs. automatic intermittent or continuous operation vs. other interpretations)?

- 9.2. The proposed program design will develop criteria for the isolation of foul air spaces (e.g., garages) from conditioned space.
- 9.3. The proposed program design will require that moisture problems be addressed prior to energy improvements if the moisture issues are directly related to the specified energy improvements and/or the moisture problems impact the indoor air quality of the building as a whole.
- 9.4. The proposed program design may recommend EPA's Indoor Air Plus IAQ protocols. Which, if any, elements of Indoor Air Plus should be required?
- 9.5. Should radon testing be required for HPwES projects?

#### 10. HPwES Quality Assurance, Data Collection, and Reporting

- 10.1. Should an infrared scan be required during all field QA inspections?
- 10.2. The proposed program design may require a deadline for submission of on-site quality inspection visits to no more than one CY quarter after an improvement is installed to be eligible to be counted in the quarterly reporting. Is this requirement too limiting in order to meet the 5% minimum on-site inspection rate? Are there other approaches the Program should consider to ensure on-site inspections accurately assess the scope and implementation of the program-related measures without being impacted by changes which may have occurred after the project test-out?
- 10.3. The proposed program design will collect project-level information from sponsors using a different format from the current reporting template. Specifically, instead of reporting the number of improvements by contractor, the quarterly reports will be recorded by project including the following data fields for each improvement: zip code (potentially zip + 4), date improvement(s) was/were completed, contractor(s) performing the improvement(s), when the improvement was reviewed administratively (file check), and whether an on-site visit was performed by the sponsor. The Program is interested in learning if Sponsors feel there will be potential issues? If so, what are possible solutions?
- 10.4. Currently, quarterly reports are submitted to HPwES through spreadsheet templates. The proposed program design may move away from template-based submissions and toward an automated process using HPXML data formats. Will this process change help lessen the burden for quarterly reporting for sponsors? Are there other options not presented that provide expedited transfer of improvement data from the sponsors to the Program?
- 10.5. HPwES is proposing a one-year transition period for Sponsors to change from the conventional reporting template to the new format. Sponsors are encouraged to begin reporting using the new protocols as soon as possible. Sponsors requiring more time are permitted to use the current reporting templates. Is a year an appropriate amount of time? If not, what is a reasonable timeframe for transition? What steps should be taken to help sponsors during the transition?
- 10.6. Sponsors often update the numbers for previous quarters during a subsequent reporting period. The proposed program design will limit the time for altering previous quarterly report numbers unless a formal request is made (accompanied by rationale for request) to HPwES. What is a reasonable time for previous quarters where corrections can be made without a formal request to the Program?
- 10.7. HPwES is interested in obtaining pre- and post-retrofit energy consumption data to determine effectiveness and to guide future refinements to the Program. What methods and protocols exist that will enable the Program to obtain such data?

## 11. Charter Contractors

- 11.1. A limited number of trade contractors will be permitted to join the Program each year and operate where no Sponsors exist.
- 11.2. Charter Contractors will need to meet more stringent Program criteria as determined by HPwES than typically required of Participating Contractors operating under Sponsors, such as:
  - 11.2.1. Be of adequate company size and stability (with internal administrative capacity)
  - 11.2.2. Locally licensed (as required) and agree to follow local codes
  - 11.2.3. Have personnel (employees or subcontractors) who have demonstrated experience in home performance business for a minimum number of years and have satisfactorily completed a minimum number of home performance retrofits
  - 11.2.4. Submit an Implementation Plan (including a QA/QC plan)
  - 11.2.5. Have required company accreditations and/or workforce certifications
  - 11.2.6. Hire an independent QA inspector
  - 11.2.7. Agree to higher Field Inspection requirements than Participating Contractors (likely 15% versus 5% of retrofits)
  - 11.2.8. Agree to abide by data collection and reporting requirements of both contractors and Sponsors.
  - 11.2.9. Agree to abide by HPwES requirements when Charter Contractors operate in sponsored areas.

## 12. Cross-Pathway and Other Efficiency Improvements

- 12.1. The Program is interested in feedback related to how to incorporate multidisciplinary measures into the pathway approach. For example, bringing the ducts into conditioned space might qualify as both an envelope and HVAC improvement.
- 12.2. Other efficiency measures outlined in the presentation are encouraged to be part of all retrofits, but are not required components of the pathways. Are there specific measures that should be required as part of all retrofits or the specific pathways that have not been identified?