

# Home Performance with ENERGY STAR Sponsor Guide and Reference Manual (v1.5)

## Minimum Requirements for Compliance

U.S. Department of Energy  
Building Technologies Office

March 2014

## Introduction

The Home Performance with ENERGY STAR Program is providing this *Minimum Requirements for Compliance* document as a quick reference tool of all the minimum requirements codified by the issuance of the *Home Performance with ENERGY STAR Sponsor Guide and Reference Manual (v1.5)*. In addition to the checklist of requirements, the *Minimum Requirements for Compliance* document provides the narrative with specifications for compliance. Refer to the full *Home Performance with ENERGY STAR Sponsor Guide and Reference Manual (v1.5)* for optional implementation guidance and suggested strategies for developing a Home Performance with ENERGY STAR program.

# Section 1: Use and Management of the Home Performance with ENERGY STAR Mark

## Minimum Home Performance with ENERGY STAR Program Requirements Checklist:

*Use and Management of the Home Performance with ENERGY STAR Mark*

- 1.1 Comply with current *ENERGY STAR Brand Book*
- 1.2 Maintain a list of authorized representatives, including participating contractors, who may use the brand and mark in compliance with the *ENERGY STAR Brand Book*
- 1.3 Use the Home Performance with ENERGY STAR name and mark to inform homeowners that services being rendered by participating contractors under the Sponsor's program follow the HPwES approach
- 1.4 Establish a process to ensure your business partners and participating contractors comply with the *ENERGY STAR Brand Book*
- 1.5 Send marketing materials, including web designs, to your HPwES Account Manager for compliance review; HPwES Account Managers require a minimum of five business days to review materials
- 1.6 Provide training about the value and minimum requirements of HPwES to all employees who provide customer service
- 1.7 Notify your HPwES Account Manager of any change in the designated responsible party or contacts for the Sponsor's program

ENERGY STAR is a nationally recognized mark on products, appliances, homes, and buildings. Diverse networks of 18,000 businesses and organizations have become ENERGY STAR partners since the mark was introduced. ENERGY STAR continues to be a powerful tool to promote energy efficiency to homeowners because it is a trusted and widely recognized name and symbol. As partners with ENERGY STAR, HPwES Program Sponsors have the privilege and responsibility to use both the ENERGY STAR Partner mark and the Home Performance with ENERGY STAR mark.

Sponsors should be familiar with the [\*ENERGY STAR Brand Book\*](#)<sup>1</sup>, beyond the requirements listed below, and ensure their participating contractors and partners also understand how they may use the Home Performance with ENERGY STAR mark. Only participating contractors and business partners with direct Sponsor partnerships may have access to the Home Performance with ENERGY STAR mark. This access is transferable only through HPwES Sponsors with active ENERGY STAR partnership agreements.

## Minimum Requirements

Sponsors shall use the Home Performance with ENERGY STAR name and mark to promote home performance services in accordance with criteria outlined in the following three documents:

1. The Home Performance with ENERGY STAR Partnership Agreement
2. *The Home Performance with ENERGY STAR Sponsor Guide and Reference Manual (v1.5)*
3. The *ENERGY STAR Brand Book*.

As detailed in the *ENERGY STAR Brand Book*, the Home Performance with ENERGY STAR name and mark shall be used in marketing and advertising materials to educate consumers or to show that a company provides services that clearly contribute to the integrated improvement of home systems. Sponsors may choose to co-brand Home Performance with ENERGY STAR with their own organization and/or program names and/or identify their home performance program

offerings as offered “in conjunction with,” “partnered with,” “affiliated with,” or similar language to make homeowners and participating contractors aware that the work being performed on a house represents HPwES. Sponsors play a vital role in establishing the value of the HPwES program by increasing the visibility of the Home Performance with ENERGY STAR name and mark. Incorporating the name and mark into program marketing materials instills consumer confidence about the backing of the DOE and EPA and helps the program continue to reinforce national consumer awareness of the brand.

## Managing Use of the Home Performance with ENERGY STAR Mark

- 1.1 Comply with the current *ENERGY STAR Brand Book*, which describes how the ENERGY STAR marks and name may be used. Sponsors are responsible for the proper use of the ENERGY STAR marks, as well as the proper use of the Home Performance with ENERGY STAR mark used by participating contractors.
- 1.2 Maintain a list of authorized representatives, such as implementation contractors, advertising agencies, and participating contractors who have permission to use the mark in partnership with the Sponsor’s program.
- 1.3 Establish a process to ensure your business partners and participating contractors comply with the *ENERGY STAR Brand Book*.
- 1.4 Use the Home Performance with ENERGY STAR name and mark to inform homeowners that services being rendered by participating contractors under the Sponsor’s program follow the HPwES approach. For instance, Sponsors are encouraged to use the Home Performance with ENERGY STAR name and mark on Sponsors’ program websites and in other promotional materials, particularly those that target homeowners. To link to the Sponsor on the ENERGY STAR website, a Sponsor must first comply with the [ENERGY STAR Web Linking Policy](#)<sup>ii</sup> found on the ENERGY STAR website.
- 1.5 Submit marketing materials and web designs developed for your HPwES program to your HPwES Account Manager for review to ensure accurate use of ENERGY STAR marks and consistent ENERGY STAR messages. The Sponsor will allow a minimum of five full working days for ENERGY STAR to review and approve website designs and marketing materials. Sponsors with a demonstrated track record for appropriate use of the mark and Home Performance with ENERGY STAR name may be given more latitude regarding this requirement at DOE’s discretion. As mentioned in steps 2 and 3 above, Sponsors are responsible for review and monitoring of their contractor and partner network’s use of the Home Performance with ENERGY STAR mark. Participating contractors that are in a “probationary” status may continue to use the mark in any on-going marketing but cannot create new materials or initiate new campaigns using the mark until their status returns to “active.”
- 1.6 Provide HPwES training to all employees who provide customer service. This training shall include: a) a description of Home Performance with ENERGY STAR, b) tips for answering questions about Home Performance with ENERGY STAR, and c) information on the economic and environmental benefits of energy efficiency.
- 1.7 Notify your HPwES Account Manager within 30 days of a change in the designated responsible party or contacts for this agreement.

As the ENERGY STAR brand manager, EPA actively monitors proper use of the ENERGY STAR name and marks. DOE and EPA will actively pursue resolution of any non-compliance related to the use of the ENERGY STAR marks.

## Section 2: Program Design and Development

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist: Program Design and Development

- 2.1 Review and sign a Home Performance with ENERGY STAR Partnership Agreement
- 2.2 Complete and annually update a Home Performance with ENERGY STAR Implementation Plan
- 2.3 Provide quarterly and annual data on the status of Home Performance with ENERGY STAR Program implementation

This section describes the minimum requirements for becoming a Home Performance with ENERGY STAR (HPwES) Program Sponsor and recommendations to design an effective program. Sponsoring a program is a significant commitment and will require an investment of financial resources and time. Therefore, organizations should establish a budget and identify sustainable funding sources before making a commitment. In addition, to maximize affordability for homeowners and profitability for contractors, Sponsors should design their program to minimize administrative burdens and any potential marketplace confusion by collaborating with other Sponsors and partnering organizations.

### Program Sponsor Definition

HPwES Sponsors are organizations that take on the responsibility of administering home performance programs in local markets. Sponsors are instrumental in developing and supporting markets for home performance services following the HPwES approach. In establishing HPwES programs, Sponsors can forge a path to achieve both near-term energy savings as well as long-term outcomes – such as a thriving home performance industry. In this capacity, Sponsors are responsible for fostering the market for home performance services by managing and monitoring the performance of their implementation vendors and participating contractors to ensure that quality standards are met. *Sponsors do not directly provide front line home performance services to homeowners*, but rather provide these services via an established network which may include: implementation vendors, participating contractors, and other program partners. To preserve public confidence and avoid any perceived conflict of interest, it is important that Program Sponsors and HPwES participating contractors are functionally independent and make appropriate efforts to maintain an arm’s length business relationship. Organizations that typically sponsor HPwES programs include utilities, state energy offices, municipal governments, nonprofit organizations, and financial institutions; however, other types of organizations with sufficient resources to manage the day-to-day operations of a HPwES program are encouraged to join.

### Minimum Requirements

HPwES Sponsors must meet three minimum requirements for Program Design and Development.

#### 2.1 Review and sign a Home Performance with ENERGY STAR Partnership Agreement

To join HPwES, potential sponsoring organizations must agree to the terms defined in the [Home Performance with ENERGY STAR Partnership Agreement](#)<sup>iii</sup>. The terms are as follows:

- a) Adhere to the *ENERGY STAR Brand Book*;
- b) Design and implement initiatives that support the tenets of the HPwES approach as described in this *Sponsor Guide*; and
- c) Meet quarterly and annual tracking and reporting requirements to document the results of program efforts.

The Home Performance with ENERGY STAR Partnership Agreement also outlines DOE and EPA responsibilities in the Partnership, including provisions to:

- a) Define and promote the HPwES approach;
- b) Recognize Partner achievements; and
- c) Provide guidance, tools, and resources to support the advancement of the home performance market.

## **2.2 Complete and annually update a Home Performance with ENERGY STAR Implementation Plan**

Sponsors shall develop a Home Performance with ENERGY STAR Implementation Plan. DOE reviews these plans to determine eligibility and readiness for sponsorship. DOE offers an Implementation Plan to guide Sponsors as they develop program plans to meet the required elements of a HPwES program. A Sponsor's Implementation Plan should include provisions for long-term operations and production growth projections, along with a business plan that includes metrics and an approach to effectively meet goals. Each year, DOE will issue an Annual Report template to Sponsors to facilitate the required update to their Implementation Plans. See [Section 7: Tracking and Reporting](#) for more details on Annual Reporting requirements.

## **2.3 Provide quarterly and annual Home Performance with ENERGY STAR Program implementation data**

On a quarterly basis, Sponsors shall provide DOE with data to assist in determining the impact of the program and to inform future revisions to DOE's Program rules. Quarterly reports include the following minimum data:

- Verified and updated list of participating contractors including status (active, probation, inactive) and a primary point of contact for accessing marketing materials
- Number of projects completed by each contractor within the reporting period
- Number of field inspections completed for each contractor within the reporting period
- Number of projects completed by the program within the reporting period disaggregated by project type: single family vs. multifamily, and an indication of how many reported projects included only program subsidized direct install measures.

Annually, Sponsors shall provide an update on activities, including information on the previous year's accomplishments and an overview of the program plans for the coming year(s). At a minimum, the annual report will include:

- Verified and updated contact information
- Verified and updated program URL and description for HPwES website
- Updated program implementation plan elements
- Summary results of preceding program year
- Summary goals for upcoming program year.

To streamline reporting, DOE will offer report templates to facilitate data collection and tracking. See [Section 7: Tracking and Reporting](#) for more details on tracking and reporting requirements, recommended approaches, and references to templates and tools.

## Section 3: Workforce Development and Support

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist: *Workforce Development and Support*

- 3.1** Develop a contractor engagement plan:
  - Assess the market to identify the target contractor base
  - Define required certifications and credentials
  - Enable contractor access to required diagnostic equipment and software tools
- 3.2** Establish minimum qualifying criteria for participating contractors including:
  - Training and credentialing requirements
  - Certification of supervisory staff
  - Capacity and resources to provide program related services
  - Compliance with local registration and licensing requirements
  - Access to qualified installation crews and/or sub-contractors
- 3.3** Provide a program orientation:
  - Conduct contractor training providing an overview of program goals and policies and procedures as they pertain to the participating contractors
  - Provide training on basic principles of building science and the house-as-a-system approach to all employees of the Sponsor, its implementation vendor, and other program staff who interact with customers
- 3.4** Ensure availability in the local market of home performance skills training (technical, software, sales, business development, installations, etc.) for participating contractors
- 3.5** Provide technical support for participating contractors and energy advisors
- 3.6** Develop and execute a Contractor Participation Agreement (CPA) including
  - Explanation of the agreement
  - Participating contractor commitments
  - Marketing and advertising guidelines, particularly with regard to use of the Home Performance with ENERGY STAR name and mark
  - Business Practices
  - Qualifications and credentials
  - Terms and conditions pertaining to termination

When launching a home performance program, Sponsors often find a limited supply of qualified contractors. Homeowners, when given improvement recommendations by a qualified consultant, typically do not have a reliable point of reference to determine who is qualified to make the improvements. Developing a strong network of professionals who are skilled in customer engagement, the whole house assessment, performance testing, diagnostic reasoning, and installation best practices is essential to a successful Home Performance with ENERGY STAR (HPwES) program. Successful Program Sponsors have developed contractor recruitment strategies and qualification criteria to identify and enroll highly motivated and successful contractors to participate in the program. The enrollment process may include training, certification, mentoring and other qualifying criteria such as maintaining specific types of insurance and completing a program orientation session. Once enrolled in the program, Sponsors are responsible for ensuring that adequate technical support is available to the contractor network to provide mentoring, technical assistance, and on-going skills development.

## Minimum Requirements

### 3.1 Contractor Engagement Plan

The Sponsor shall establish a contractor engagement plan which includes identification of the targeted contractor base, a strategy for reaching candidate contractors, clearly defined qualification criteria, and the means by which those criteria can be satisfied. The Sponsor is not required to submit this plan to DOE for review, but Sponsors shall describe the related policies and procedures as part of the initial Implementation Plan submitted when establishing sponsorship. Sponsors shall provide a description of any updates to the contractor engagement plan when responding to DOE's annual data call (described in [Section 7: Tracking and Reporting](#)). The engagement plan shall clearly define the credentialing requirements for participating contractors including which credentialing program(s) are acceptable, which certification(s) are required and by whom within the participating contractor's team. The plan shall also include a description of how training and testing services will be accessed and who is responsible for incurring the costs associated with those activities. The plan shall include a review of the local market to determine the capacity of home improvement contractors to provide HPwES services and to identify potential early adopters. Additionally, the Sponsor shall provide a description of any specific organizations they will engage or other strategies and tactics that will be used to assist in identifying and contacting contractor prospects. Upon request by DOE or its designated agents, the Program Sponsor shall make the plan available for review.

The engagement plan shall also include a description of the enrollment process, including all steps required for contractors to qualify for participation in the program. At a minimum, the enrollment process must include:

1. Orientation covering the program's technical and administrative requirements and contractor responsibilities
2. Identification of certification or alternative credentialing requirements demonstrating the skills and knowledge required for home performance work
3. Contractor procurement of (or demonstrated access to) the minimum required diagnostic equipment and software tools to complete home performance work
4. Execution of a participation agreement between the contractor and the Sponsor.

### 3.2 Participating Contractor Minimum Qualifying Criteria

Contractors participating in the HPwES Program are expected to meet or exceed the following criteria:

1. Through training and credentialing, the Contractor's staff (and sub-contractors, if applicable) shall be proficient in the knowledge, skills and abilities needed to conduct whole house assessments, building performance diagnostics and reasoning, and estimates of energy savings from improvement installations (via calculations or a modeling software tool).
2. Certification of designated workers to assure the quality of the work completed through the HPwES program including a minimum of one site visit per HPwES project by appropriately credentialed individuals. The credentialing

**Tip:** HPwES Sponsors should anticipate that participating contractors will experience turnover among their credentialed staff over time. Additionally, most worker certifications are subject to periodic renewal (typically every 3-5 years.) As a result, it is important to establish a system for tracking and verifying that participating contractors not only satisfy credentialing requirements included in your contractor engagement plan when they sign up for the program, but also that they maintain those credentials over time.

process shall be at least as rigorous as those employed by nationally recognized certification bodies<sup>1</sup>. If an alternative process is used, it shall be overseen by the Sponsor and approved by DOE to ensure it meets or exceeds the level of rigor required by nationally recognized certification programs<sup>2</sup>.

3. The contractor must demonstrate adequate capacity and resources (in-house or through the support of the program or other allied third parties) to engage customers, conduct whole house assessments, building performance testing and diagnostic reasoning, and fulfillment of all program data collection and reporting requirements. This includes having access to adequate diagnostic equipment, tools, qualified staff, data systems and software, and administrative support.
4. The contractor must be current and in good standing with all local registration and licensing requirements for their specific region and trade(s). (*Note: The Sponsor is not responsible for maintaining records of contractor licenses and registrations but must require the contractor to take responsibility by including this requirement within the terms and conditions of the contractor participation agreement. Failure to comply with this requirement may be cause for a contractor's suspension or dismissal from the program by the Sponsor.*)
5. The contractor must employ or sub-contract to companies with workers who are qualified to install and/or physically oversee the installation of home performance improvement measures in compliance with local building codes and industry-accepted protocols. Qualifying criteria for workers may include training, experience, licensing, certification, or other requirements specified by the Sponsor.

### 3.3 Program Orientation

The Sponsor shall provide an orientation for prospective participating contractors which includes an overview of the program and its goals, a review of the procedures and rules for participation including technical and administrative requirements (e.g. paperwork and data reporting), and a review of the contractor qualification criteria and enrollment process. The program orientation shall also include a review of the program's quality assurance (QA) procedures and the contractor's role in the QA process including corrective actions and disciplinary policies and procedures. Additionally, the program shall provide training for all program staff engaged in customer service activities. Training for customer service staff shall cover the fundamentals of what is meant by home performance, building science, and the house-as-a-system approach and the value to the customer.

### 3.4 Home Performance Skills Training

Home performance training shall be made available to the contractor community. Trainings will help to build and support an infrastructure of qualified contractors and should cover the principles of building science, whole house diagnostics, energy assessments, measure installation requirements and techniques, elements of a successful home performance contracting business and effective customer engagement techniques including marketing, sales, and customer relations. Program Sponsors often need not spend resources developing technical, business development, customer engagement, and sales training, since many local, regional and national organizations already offer training appropriate for home performance work. However, the Sponsor shall have a plan in place describing how contractors can access the training needed to prepare for home performance work.

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<sup>1</sup> Most current Sponsors have adopted the Building Performance Institute (BPI) Building Analyst and/or RESNET Home Energy Rating System Rater certifications as part of their minimum qualifying criteria for participating contractors.

<sup>2</sup> Under the [Guidelines for Home Energy Professionals](#) initiative, DOE has created a Job Task Analysis for each of four job designations which may be used as the basis for both training and technical certifications in HPwES programs.

### 3.5 Technical Support

The technical training required to initially become certified is only a starting point for newly practicing home performance contractors. The necessary skills and knowledge—to efficiently complete a home performance assessment, accurately diagnose building performance problems, prioritize improvement recommendations, troubleshoot unexpected findings, and use best practices during installation of measures identified through the assessment process—are developed over time with experience. Additionally, home performance work often includes measure specifications and installation techniques which may be new to the local contracting community. For this reason, Sponsors are often the best resource for ensuring that participating contractors have access to on-going technical support and shall be responsible for facilitating access for participating contractors to appropriate training and technical resources over time.

### 3.6 Contractor Participation Agreement

The Sponsor shall create a Contractor Participation Agreement (CPA) describing the roles and responsibilities of both the contractor with respect to the Sponsor and vice versa. A signed Participation Agreement shall be executed by all participating contractors in the program. It is the Sponsor’s responsibility to ensure this is completed as part of the contractor enrollment process. Every contractor working within a Sponsor’s HPwES program must have signed a Participation Agreement indicating an understanding and intent to abide by the *ENERGY STAR Brand Book*, to follow standards and specifications of the program, and to report HPwES project data to the Sponsor.

The following table lists the required elements to be included in the Contractor Participation Agreement.

Section	Required Elements
Explanation of Agreement	<ul style="list-style-type: none"> <li>• <b>Terms and Conditions:</b> establishes the terms and conditions under which contractors may participate in the Sponsor’s Program.</li> </ul>
Participating Contractor Commitments	<ul style="list-style-type: none"> <li>• <b>Project Reporting:</b> describes the administrative procedures and requirements the participating contractor must follow to document (and often be compensated for) a completed HPwES project.</li> <li>• <b>Field Inspections:</b> describes the terms and conditions under which the participating contractor shall allow access for the Sponsor or its designee to conduct in-process and post-installation field inspections. This section also describes the parameters for participating contractors to address any deficiencies identified through the inspection process.</li> <li>• <b>Sub-contracting:</b> articulates conditions under which the participating contractor may enter into sub-contract arrangements for completion of project work scopes.</li> </ul>
Marketing and Advertising	<ul style="list-style-type: none"> <li>• <b>Use of the Home Performance with ENERGY STAR Name and Mark:</b> describes the compliance requirements for a participating contractor’s use of the Home Performance with ENERGY STAR name and mark. This section should specifically reference the current <i>ENERGY STAR Brand Book</i>, which describes how the Home Performance with ENERGY STAR mark and name may be used. Additionally, Sponsors shall describe procedures for addressing any non-compliance related to the use of the ENERGY STAR marks.</li> </ul>
Business Practices	<ul style="list-style-type: none"> <li>• <b>General Business Practices:</b> lays out the obligations for licensures, permits, liability insurance, certifications, training, and other requirements deemed necessary by state law and the Sponsor’s Program policies and guidelines. This section also includes reference to all relevant documentation and specifications pertaining to the installation of efficiency measures.</li> </ul>
Qualifications and Credentials	<ul style="list-style-type: none"> <li>• <b>Credentials/Skills:</b> describes the Sponsor’s requirements for certification or other accepted third-party verification of knowledge, skills and abilities needed to conduct whole house assessments, building performance diagnostics, and to calculate estimated energy savings from improvement installations.</li> <li>• <b>Equipment:</b> lays out the required access to adequate diagnostic equipment, tools, qualified staff, data systems and software, and administrative support.</li> </ul>
Termination	<ul style="list-style-type: none"> <li>• <b>Right to Terminate:</b> outlines the terms and conditions under which the Sponsor may terminate the Contractor Participation Agreement.</li> </ul>

## Section 4: The Assessment

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist:

#### *The Assessment*

- 4.1** Develop and require a Home Performance Assessment (HPA) for each HPwES project, which ensures that the following tasks occur at some point in the HPA process:
- Customer interview
  - Review of energy bills, if available
  - Visual inspection of the home, interior and exterior
  - Minimum diagnostic tests
  - Data collection of building assemblies and mechanical systems
- 1.2** Develop and require a Home Performance Assessment (HPA) Summary Report for each HPwES project, which includes at a minimum:
- General information
  - Existing conditions
  - Prioritized list of recommended improvements (the proposed improvement measures)
  - Notice of health and safety related issues
  - Savings projections (estimated, modeled, or calculated)

The Home Performance Assessment (HPA) is a critical element of Home Performance with ENERGY STAR. However, it is important to note that the primary goal of Home Performance with ENERGY STAR (HPwES) is to facilitate the installation of quality home performance improvements. As the first step in this process, the assessment should be designed and implemented to encourage the installation of home performance improvement measures in the evaluated homes.

The HPA may be completed using a variety of approaches. Fundamentally, it should be designed to capture as much information as necessary to generate a list of recommended home performance improvement measures that will address the customer's needs, and improve the energy efficiency and comfort of the home. The level of detail needed to achieve these goals will vary based on the customer, the housing type and condition, climate, fuels used within the home, and other localized factors.

In addition to conforming to the Minimum Requirements listed in the checklist and described in more detail in the following section, when designing the HPA for a program, Sponsors should also strive to apply the **Guiding Principles** in the text box below.

It is not required that all elements of the HPA be completed in a single visit to the home. While many programs operate this way, some find value in a multistep approach. Screening visits and walk-through assessments may be used to collect preliminary information about the home and customer to determine if they are good candidates for the HPwES program before investing in additional elements of the HPA. Preliminary screening through data collection over the phone or through an application process can also assist programs in directing customers to the appropriate program and/or level of service. Likewise, Sponsors should build sufficient latitude into the HPA process to allow contractors to experiment with different ways of delivering the HPA in order to increase customer engagement.

## Guiding Principles

1. **Customer Engagement:** Notwithstanding the need for a basis in building science, particularly health and safety, the HPA should be designed to engage the customer and motivate them to action. The Program is not successful unless recommendations are converted into installed measures.
2. **Basis in Building Science:** The HPA must include an evaluation of the home's enclosure and energy-related systems that is based on the fundamental physics of energy, airflow, and moisture in buildings.
3. **House-as-a-System Approach:** When evaluating the performance of the home and determining recommended improvements, the assessment must consider the interactive effects of all energy-related systems in the home using a systems-based approach. In this context, the "performance" of the home is inclusive not only of energy efficiency, but also the comfort, health, and safety of the occupants, and the durability of the building enclosure and its mechanical systems.
4. **Inspection and Measurement as Needed:** As each home presents a unique set of physical and operational characteristics and attributes, the assessment shall include inspections, measurements, and diagnostic tests which are sufficient to provide the data needed to evaluate the performance of the home's energy-related systems, including both individual and combined systems.
5. **Documentation, Analysis, and Reporting:** The assessment shall include an analysis and diagnosis based on observed and measured data with a list of prioritized recommended improvements and a prediction of the improved home performance including estimated energy savings.

## Minimum Requirements

The HPA shall include an interview with the homeowner and occupants, and a review of the energy consumption history if the home is occupied. The HPA shall also include an inspection of the home, diagnostic testing as necessary to evaluate conditions which are not readily observable, a review of the data collected, and analysis of that data to produce a HPA Report. The HPA Report shall include a prioritized list of recommended improvements including projected energy savings estimates and notification of health, safety, and durability issues identified during the HPA. Each of these requirements is described in greater detail below.

**Tip:** When designing your program's HPA, careful consideration should be given to striking a balance between the technical needs of the program and the effectiveness of the HPA as a sales tool. One issue that is integral to this decision process is the selection and timing of diagnostic tests. The goal should be to gather information during the HPA that is both necessary and sufficient to develop an accurate improvement proposal and to successfully persuade the customer to commit to the improvements. On the other hand, the HPA should not be so lengthy or complicated as to pose an undue burden upon the customer or the program's overhead costs. See the Recommended Approaches for considerations in the selection and sequencing of diagnostic testing.

## 4.1 Home Performance Assessment

The HPA includes specific activities (i.e., inspections and tests) to evaluate a home's existing condition and prepare a proposed energy efficiency improvement package for the homeowner. Program Sponsors shall have policies and procedures describing the minimum requirements of the HPA and the minimum qualification criteria for the person performing the assessment. The diagnostic tests that are specific to individual measure installations are not required to be completed in a single visit to the home during the HPA, but must be completed prior to or concurrent with the commencement of improvement installations under the HPwES program. Additional detail describing the minimum requirements for diagnostic tests is included in [Section 5: The Project Installation](#) of the *Sponsor Guide*.

The HPA shall include, at a minimum, the following elements with the understanding that any of these elements may be omitted on a case-by-case basis if it is physically impossible to complete the task (e.g., if the house is unoccupied it may be impossible to complete an occupant interview):

- **Customer Interview:** At some point before, during, or after the physical inspection of the property, the participating contractor shall interview one of the primary occupants of the home to identify any specific issues the customer is seeking to address through the HPwES program and typical occupant behavioral patterns as they relate to the performance of the home.
- **Review of Energy Bills:** The participating contractor shall also request historical energy bill data from the customer as part of the HPA. While useable, detailed historical bill data may not be available in all cases, it is important for the contractor to ask for whatever information is available as a reality check against projected savings estimates. A review of energy consumption data is critical to determining how the homeowner uses energy; not having this information limits the effectiveness of the HPA. When historical fuel-use data is available, the participating contractor shall review that data to identify patterns that will inform the prioritization of recommended measures and confirm that projected energy savings estimates are realistic. At a minimum, the participating contractor shall review customer-reported annual or monthly energy costs and use it as a benchmark against estimated cost-savings predictions.
- **Combustion Appliance Safety Evaluation:** When combustion appliances and/or space heating equipment are present in the home, a combustion appliance safety evaluation shall be completed following industry-accepted protocols. At a minimum, this evaluation shall include a check for fuel leaks, carbon monoxide, and confirmation that flue gases are exiting the building as required by the equipment manufacturer's specifications. If original manufacturer performance data is unavailable, industry-accepted standards such as *DOE's Guidelines for Home Energy Professionals: Standard Work Specifications for Single-Family Home Energy Upgrades* (Section 2.02) shall be used<sup>3</sup>.
- **Visual Home Inspection:** A visual inspection shall be completed of the home's exterior, interior, thermal envelope and enclosure, and all mechanical systems (including equipment, distribution systems, and controls).

<sup>3</sup> Alternative acceptable methods include but are not limited to BPI's Technical Standards for the Building Analyst Professional ("Combustion Safety and Carbon Monoxide Protection," pages 9-15); and American National Standards Institute (ANSI)/ACCA 12 QH-2011 Existing Home Evaluation and Improvement Standard, Section 3.3.

- **Diagnostic Tests:** Instrumented diagnostic testing shall be completed as part of the HPA process as required to effectively assess the home’s energy performance, produce energy savings estimates, and develop an accurate list of recommended improvement measures. The specific required diagnostic tests may vary based on a variety of factors including: local program requirements, the customer’s needs and desires, climate, housing stock, mechanical system types, and existing conditions within the home but shall remain consistent with the Guiding Principles. Additional guidance on the required diagnostic tests that must be performed during the course of HPwES project is included in Section 5: The Project Installation.
- **Data Collection:** Observed and measured data shall be recorded during the HPA including: documentation of the home’s physical geometry, features, and measurements; identification and performance data for space heating, cooling, ventilation, and domestic hot water equipment and systems; existing type, quantity, and condition of thermal elements of the building enclosure; evaluation of envelope air leakage paths, and information about existing lighting and major household appliances which may be used to inform customers of opportunities for improvements.

For certain kinds of housing stock, mechanical system types, climate zones, or other conditions, it may be necessary to require additional diagnostic testing as part of the core assessment. It is the Sponsor’s responsibility to ensure that the minimum requirements for their program satisfy the intent of all of the aforementioned Guiding Principles.

## 4.2 The Home Performance Assessment Summary Report

Upon completion of the HPA, participating contractors shall present the homeowner with an HPA Summary Report that communicates inspection findings and enumerates the improvement recommendations identified during the assessment.

At a minimum, the elements included in the following table are required to be included in an HPA Summary Report and may be provided as a stand-alone report or concurrent with a contract and agreed upon Scope of Work. Sponsors may elect to require additional data collection and documentation for program-specific purposes, such as incentive eligibility screenings, cost-effectiveness evaluations, or building energy modeling.

To facilitate the process of developing HPA reports for every home served by HPwES, it is allowable to use generic descriptions as applicable for report elements that are likely to be encountered frequently within the program’s service territory. For instance, it may be helpful to develop “typical language” that can be used in the report to discuss energy efficient lighting or appliance options based on the most likely scenarios the contractor is likely to encounter.

## Home Performance Assessment Report: Required Elements

	Required Elements	Description
General Information	Participating contractor name Contractor contact information Identification of the contractor's qualifying credential(s) Name of technician completing the HPA	Annotates the company taking <u>primary responsibility</u> for the HPwES project. This is the contractor of record who will be credited with the project in data reported to DOE.
	Customer name Assessed home's address	Additional data such as utility account numbers may be required by the Sponsor to uniquely identify the site and qualify the project for program incentives. (Note: Although the information noted should be included in the homeowner report, DOE does not collect any personally identifiable information for HPwES customers.)
	Date of HPA	The date that the primary assessment site visit was conducted.
Existing Conditions	Building envelope air leakage evaluation	Results of the visual inspection shall be recorded including a preliminary identification of leakage paths to be sealed or general scope of air sealing work to be completed as a recommended improvement measure.
	Thermal barrier condition assessment	Includes all walls, floors, ceilings and other enclosure elements comprising the envelope of the building. The report shall document the general conditions and estimated existing R-value (or U-value) for each unique surface.
	Mechanical systems inventory and condition assessment	Includes identification of all heating, cooling, domestic hot water, and ventilation systems in the home by system and distribution type; fuel type; make and model numbers; rated and/or measured operating efficiencies; and condition evaluation.
	Heating and cooling distribution system condition assessment	Includes a description of the existing heating and/or cooling distribution system by location, insulation condition, leakage assessment, and general condition evaluation including potential design flaws to be considered for improvement.
	Lighting and appliance assessment	Includes a general description of the overall condition, age, and efficiency (if available) of major household appliances in the home as well as a general evaluation of the opportunity for efficiency improvements to the existing lighting. Note: a detailed inventory of all lighting and appliances in the home is not a requirement.
Proposed Improvement Measures	Prioritized list of recommended improvements	Includes home performance improvement measures identified during the assessment. Prioritization shall be determined based on: (1) resolving health and safety related issues; (2) satisfying customer needs and desires; (3) overall cost-benefit to the customer; and (4) programmatic goals. The loading order of recommended improvements shall be consistent with industry-accepted standards and building science principles.
Health and Safety	Documentation of moisture-related problems	Includes signs of water intrusion, condensation, mold, and water stains; suspected sources and causes; and recommended repairs.
	Results of combustion appliance evaluation	Includes a general condition assessment based on visual inspection as well as results of diagnostic tests used to evaluate fuel leaks, carbon monoxide, and drafting of flue gases.
	Identification of hazardous conditions and recommended mitigation measures	Includes repairs that must be completed prior to or concurrent with energy-related improvements (e.g. electrical repairs, roof replacements, asbestos removal, etc.).
Energy Savings	Estimated energy savings	Includes projected site energy savings associated with the recommended improvement package(s). This may be presented in terms of reduced fuel consumption, reduced costs, a percentage improvement over existing conditions, or an improvement on a relative scale or benchmark such as a Home Energy Score, Home Energy Rating, or Energy Performance Score. (Note: Energy simulation software is not a requirement.) Savings estimates shall clearly indicate whether savings are projected for electricity, heating, cooling, or total household energy consumption.

## Special Requirements for Multifamily Buildings

### Scope of Building Types

Any multi-unit building subject to residential building codes as determined by the local authority may participate in HPwES.

### Reporting Options

HPwES projects may be reported at the building or the dwelling unit-level, depending on the building type and the nature of the improvements that were installed.

### HPwES Program Participation

In all cases, projects must be overseen by a HPwES Program Sponsor and follow all minimum requirements as required for single family detached dwellings. When whole building improvements (e.g., insulation of an attic space covering multiple dwelling units) are installed following these guidelines, the Sponsor may count all dwelling units directly improved by those measures toward their reported HPwES completed projects. When buildings are improved unit by unit, only those dwelling units that have been improved may be counted. Improvements impacting the energy efficiency of common areas and other non-residential spaces may be included in overall work scopes, but only projects directly impacting dwelling units will be recognized by the HPwES Program.

### Mechanical System Provisions

#### Individual Mechanical Systems

Buildings with separate mechanical systems that provide all heating, cooling, domestic hot water (DHW), and ventilation for each dwelling unit individually may be counted as projects in the HPwES Program provided that all other requirements listed in this section are met. Program Sponsors may adopt more stringent or specific requirements at their discretion.

#### Central Mechanical Systems

Buildings using any heating, ventilation, and air conditioning (HVAC) related central mechanical systems including heating, cooling, DHW, and ventilation systems will require DOE review and approval for inclusion in the HPwES program. Sponsors may apply for program-wide authorization to include specific building types in their HPwES portfolio by submitting for DOE consideration a summary of the program's technical requirements for low-rise multifamily buildings with central systems. This requirement is a one-time process review to ensure appropriate provisions are in place in the program's policies and procedures to address the unique technical challenges of buildings with central mechanical systems servicing multiple dwelling units. Sponsors are not required to obtain project-by-project approvals from DOE for HPwES.

### Energy Modeling and Savings Predictions

Energy simulation using modeling software is not required by the HPwES Program for single family homes or for low-rise multifamily buildings. However, when energy simulation software is used to predict energy savings and cost-benefit analysis of proposed improvements in multifamily projects, the following guidelines apply:

- Buildings with individual mechanical systems in each dwelling unit may be modeled as a whole building or unit by unit at the Sponsor's discretion.
- When individual dwelling units are modeled, the simulation should assume no heat transfer across surfaces separating similarly conditioned spaces following the software developer's recommended method for modeling these surface types.
- Buildings with any central mechanical systems (including heating, cooling, DHW, and ventilation) should be modeled using software designed for whole building energy simulation. Additional provisions for the determination of predicted dwelling unit savings may be applied at the Sponsor's discretion.

When evaluating a whole building using unit-level modeling, Sponsors may elect to model every apartment in the building or apply one of the following sampling approaches to estimate pre- and post-retrofit energy consumption:

- Model the energy consumption for each unique unit type (including variations based on size, geometry, mechanical systems, number of bedrooms, and exposed surface configurations) and then aggregate the results across all units in the building to determine the whole building energy consumption.
- Follow sampling protocols in the RESNET Standards<sup>4</sup> and model worst-case configurations of each unique floor plan.

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<sup>4</sup> The sampling protocols referenced here are intended to be applied for purposes of energy assessments and test-in/test-out diagnostics. This is not to be confused with the minimum requirements for QA inspections.

## Section 5: The Project Installation

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist

#### *The Project Installation*

- 5.1** Develop and require measure installation specifications, which include at a minimum:
- Installation of measures, including the sequence of installation shall be consistent with the contracted Scope of Work (SOW), as agreed upon between the participating contractor and the customer
  - Installations shall be compliant with local building codes and permitting procedures, industry-accepted standards, and manufacturer's specifications for the materials and equipment being installed
  - Ventilation shall be installed as prescribed by industry-accepted standards whenever the home's air exchange rate is determined to be below the required air exchange rate for good indoor air quality as determined by the referenced standard(s).
  - Materials and installation techniques used shall be consistent with a building science-based approach
  - Installations shall be completed by qualified workers
- 5.2** Develop and require test-out procedures, which include at a minimum:
- Visual inspection of installed measures as specified in the SOW, review of commissioning reports, and diagnostic tests as necessary to confirm that manufacturers' specifications and industry-accepted standards have been satisfied
  - Combustion safety checks for all projects where improvements might impact combustion appliance performance
  - Blower door tests when measures impacting infiltration rates are installed

It is the Sponsor's responsibility to ensure that improvement measures installed under the Home Performance with ENERGY STAR (HPwES) Program are installed in accordance with Program specifications. The Guiding Principles for HPAs (refer to Section 4) hold true for the installation of recommended measures. Adhering to these general principles will help prevent the adverse impacts of substandard improvement work and ensure that predicted energy savings are realized post-improvement.

One feature that distinguishes HPwES projects as a value-added service for residential customers is the series of inspection and instrumented tests the home performance contractor performs after the improvements are made to a home. These tests support the do-no-harm principal that is a hallmark of home performance contracting. While there is no guarantee that any home will operate safely under all conditions, the HPwES Program is explicitly concerned about health and safety of the occupants. In addition to addressing health and safety issues that may be directly affected by the home performance work, some of the tests provide valuable information on the effectiveness of certain installed measures and verification that estimated savings objectives have been met and systems are operating with specifications.

### Minimum Requirements

The Scope of Work (SOW) shall serve as the set of measures agreed upon by both the participating contractor and customer after review of the HPA results, recommended improvement measures, the customer's specific needs and wants, and the Program Sponsor's requirements. This includes installation specifications as well as appropriate sequencing of measure installations (i.e., loading order) to ensure predicted performance improvements have been achieved. At this stage in the project, loading order of measure installations is determined based on the final contracted SOW and consideration of customer needs and site-specific conditions. Installation requirements described within this section refer only to the contracted SOW.

## 5.1 Scope of Work and Installation Requirements

The improvement measure specifications included in the contracted scope of work shall be consistent with Sponsor-defined minimum installation specifications. It shall include descriptions of individual measures to be installed. Additionally, the scope of work shall include information on the materials, quantities and sizes, as applicable to ensure performance (e.g., recommended insulation type and density should be listed if a change in the specification might impact the final performance of the measure); and rated post-installation energy performance data (e.g., R-values and annual fuel utilization efficiency (AFUE) ratings).

The SOW specifications should also include any special instructions for the customer (e.g., removal of storage from areas to be treated) and descriptions of how access will be obtained if necessary.

When installing measures for a HPwES project, the following minimum requirements shall be followed:

- Sequencing of the installation of measures shall be completed in a manner that prevents potential subsequent defects (such as moisture problems or backdrafting combustion appliances) and maximizes energy savings. (Note: Consumer driven preferences and needs are already factored into the prescribed loading order of the contracted SOW during consultation and negotiations resulting from the HPA Report and recommended improvement package).
- Installations shall be compliant with building codes, industry-accepted standards, and manufacturers' installation instructions for the materials and equipment being installed. This requirement does not impose responsibility for code enforcement upon the Sponsor; however, the Sponsor shall take measures to ensure that participating contractors are working within local compliance requirements. These measures may include collecting evidence of current contractor licenses, verifying that permits are pulled where required, reviewing code inspectors' reports, or other appropriate actions. The Sponsor shall be responsible for identifying which specific industry standards (e.g., DOE's *Guidelines for Home Energy Professionals: Standard Work Specifications for Single-Family Home Energy Upgrades*, BPI's *Technical Standards for Building Analysts*, American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 62.2-2013, ACCA Standard 5 QI-2010, NFPA 54-2012, etc.) are to be referenced for HPwES projects.
- If natural air exchange rates are below the rates prescribed by industry-accepted standards, then intentional passive and/or mechanical ventilation system improvements shall be included in the scope of work to satisfy these requirements. Specifications for envelope measures designed to reduce air exchange rates shall be prioritized based on preventing defects (such as interior moisture migration into building cavities), reducing energy consumption in the building, and improving the thermal comfort within the building. Air sealing and insulation measures necessary to address these issues shall not be limited to avoid reducing air exchange rates below the minimum requirements for indoor air quality.
- Materials and installation techniques used shall be consistent with a building science-based approach to achieve projected energy savings, minimize indoor air quality problems, minimize the accumulation of moisture in building assemblies, and ensure materials and equipment installed operate at rated capacities and efficiencies.
- All measures shall be installed by qualified workers.

## 5.2 Post-Installation "Test-Out" Procedures

To ensure that the "test-out" is performed properly, Program Sponsors shall adopt test-out requirements in their program policies and procedures that meet or exceed the guidance in this document. Participating contractors commonly conduct their own post-testing, but some Sponsors use a third-party for the final test-out. While it may include a similar set of tests

and inspections, this process is not the same as inspections that are conducted for quality assurance purposes (see [Section 6: Quality Assurance](#)). The test-out process is a standard element of every home performance project. Documentation of test-out results may be used to quantify final energy savings projections as well as verify that systems are performing within specifications.

The following are minimum requirements for HPwES test-out procedures on all projects:

- Installation of measures as specified in the SOW shall be verified via visual inspection, review of commissioning reports or mechanical system performance testing documentation, and other diagnostic tests as necessary to confirm that the manufacturers' specifications and industry-accepted standards have been satisfied and systems are performing at least as efficiently as specified in the contracted SOW.
- Combustion safety checks are required for all homes with combustion appliances following industry-accepted protocols. At a minimum, this evaluation shall include a check for fuel leaks, carbon monoxide, and confirmation that flue gases are exiting the building as required by the equipment manufacturers' specifications. If original manufacturer performance data is unavailable, industry-accepted standards such as DOE's *Guidelines for Home Energy Professionals: Standard Work Specifications for Single-Family Home Energy Upgrades* (Sections 2.0111.4-2.0301.2) shall be used.
- Post-installation blower door tests are required when measures impacting the building's natural air exchange rates are installed. Final air exchange rates (either natural or mechanically driven) must be within industry-accepted tolerances<sup>5</sup> to ensure indoor air quality.

## Special Requirements for Multifamily Buildings

### Types of Improvements

#### Whole Building Improvements

Whole building improvements are defined as measures which impact the energy-related performance of the overall building. Examples include air sealing and insulation of roof or attic spaces covering multiple dwelling units, upgrades to a central heating system serving multiple apartments, and building-wide replacement of windows.

#### Unit-by-Unit Improvements

Unit-by-unit improvements are defined as measures with impact limited to the energy-related performance of individual dwelling units. Examples include in-unit lighting and appliance upgrades and replacement of in-unit heating, cooling, and DHW equipment.

### Performance Testing and Quality Assurance

Test-in and test-out requirements for installed measures are the same as for single family detached buildings described in [Section 4: The Assessment](#) and [Section 5: The Project Installation](#) of the *Sponsor Guide* with the following modifications. Sampling should follow RESNET Standard (Sections 603.7.1 through 603.7.8 and Section 603.8) or include a minimum of 10% of the total number of dwelling units treated that are fully representative of the variation in

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<sup>5</sup> For example, ASHRAE Standard 62.2-2013, "Ventilation and Acceptable Indoor Air Quality in Low Rise Buildings."

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exposed surfaces (for envelope measures) and mechanical equipment (for mechanical measures) across the entire population of improved dwelling units.

- Combustion safety testing must be completed for all combustion appliances located within the building that may be impacted by improvements. Sampling protocols may not be applied to combustion safety testing requirements.
- Whole building blower door tests are not required for whole building attic treatments. In-unit blower door testing should be used to verify unit-level air exchange rates for ventilation purposes whenever shell-tightening measures are part of the scope of work at the dwelling unit or whole building level. A sampling approach may be used for in-unit blower door tests to determine ventilation rates if there are no other health and safety-related issues.
- A sampling approach may be used for test-in/test-out of in-unit improvements unless they are health and safety related (for the purposes of this provision, blower door tests are exempt from the health and safety related category unless there is a specific health and safety concern unique to the building or project).
- Guarded blower door tests (i.e., using multiple blower doors simultaneously in adjacent spaces) may be used to isolate leakage paths for diagnostic purposes but are not required.

Minimum required Quality Assurance (QA) inspection sampling rates are the same as for single family detached dwellings based on the total number of dwelling units improved under the HPwES Program as described in [Section 6: Quality Assurance](#) of the *Sponsor Guide*.

## Project Oversight

All HPwES projects and test-out diagnostics must be physically overseen by a qualified technician to complete pre/post diagnostic tests and ensure compliance with all Program rules. A building owner or management company may act as their own contractor if they have the in-house capacity to install HPwES project measures. Sponsors may elect to establish their own rules for third-party oversight of HPwES projects.

## Section 6: Quality Assurance

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist: Quality Assurance

- 6.1** Ensure program and contractor compliance with the ENERGY STAR Brand Book
- 6.2** Ensure that a signed contractor participation agreement (CPA) includes requirements for compliance with the Sponsor's QA system
- 6.3** Implement a mechanism for customer feedback
- 6.4** Institute a conflict resolution procedure to address problems identified through Quality Assurance/Quality Control (QA/QC) activities and customer feedback.
- 6.5** Implement on-site inspection procedures and maintain records on quality control activities relating to the participating contractors including:
  - Inspection sampling rate
  - Inspection findings
  - Corrective actions, including process improvements resulting from Quality Control activities
  - Be prepared for review by request of DOE or its implementation contractor
- 6.6** Establish and implement procedures for due process and remedial actions
- 6.7** Implement one of the following two options:
  - 6.7.1** OPTION 1: Meet minimum requirements for Quality Control
  - 6.7.2** OPTION 2: Implement a Quality Management System

Quality Assurance (QA) is an essential component of Home Performance with ENERGY STAR that helps protect the integrity of the ENERGY STAR brand, and ensure that federal and local objectives are being achieved through energy savings, improved living environments, and a thriving home performance industry. Sponsors are responsible for developing and implementing a Quality Assurance/Quality Control (QA/QC) program to achieve these goals. Quality assurance protects homeowners by providing independent oversight of the work performed by participating contractors to ensure that it meets program standards. Quality assurance also protects the reputation of the HPwES Sponsor and participating contractor, and provides a feedback mechanism for both customers and participating contractors to support continuous improvement.

Quality assurance is often confused with quality control. Quality assurance deals with *systems that are designed to meet customer expectations*. Quality control is concerned with *a product or service meeting a particular standard*. A product or service may meet quality control requirements by conforming to a standard or specification but miss the mark in terms of quality assurance if the customer's expectations are not satisfied.

A properly designed and executed quality assurance plan eliminates ambiguity by clearly defining and addressing each of the following:

- Overall program goals
- Identification of the various types of customers served and their associated needs and desired outcomes
- QA responsibilities of the organization(s) and individuals engaged in program activities
- Success metrics
- How success metrics are measured
- How overall process improvements are informed by QA/QC activities.

There are several general quality requirements for Sponsors included in the following section, in addition, Sponsors are required to select one of two possible paths to fulfill the quality assurance requirement for HPwES, as described below:

- Option 1: Quality Control (QC)**  
 The QC option relies primarily on checks and inspections performed by a party that is external to the installing contractor (e.g. program staff, dedicated QC vendors hired by the program, or other independent third parties) to verify compliance with program standards and customer satisfaction. Deficiencies identified as a result of the QC process are addressed through feedback to the contractors and enforcement of a clearly defined issue resolution process. Sponsors using the QC-based approach as their primary QA option may also choose to employ some of the strategies described in the QMS-based system (Option 2) to enhance their QA/QC program.
- Option 2: Quality Management System (QMS)** The QMS option uses a systems-based approach promoting the integration of quality principles throughout the entire program delivery infrastructure from the Sponsor to its entire staff, vendor, and contractor network. The QMS approach relies on instilling a culture of quality which holds each individual working within the program responsible for delivering quality products and services as defined by a customer-focused set of pre-defined criteria. While QC activities identified in Option 1 may be a part of a QMS program, the long-term burden to the program associated with QC activities can be reduced with the implementation of a successful QMS program.

Definitions for key terms associated with quality assurance systems are provided in the **Error! Reference source not found.** An overview of QMS for HPwES and a comparison of the traditional QC-based approach vs. the QMS approach are included in **Error! Reference source not found.**[F](#).

## Minimum Requirements

The Sponsor is required to maintain records and permit access to those records by DOE, EPA, and their authorized agents to demonstrate compliance with the commitments defined in the signed Program Sponsor Partnership Agreement. To verify compliance and maintain the integrity of the program for all Sponsors, DOE and EPA will perform periodic audits and may request records for review. Records may be reviewed by DOE, EPA, and their authorized agents, either remotely via electronic document and data review, or through site visits to the Sponsor's location.

Sponsors are allowed to select one of the two options described above as their primary means of satisfying the HPwES Program QA requirement. The option selected shall be included in the Sponsor's Implementation Plan (and updated in the Sponsor's Annual Report) with policies and procedures made available to DOE or its designated agents upon request.

The following table lists the minimum QA/QC requirements, the associated QA/QC Option 1 or 2 for each required element, and the primary verification activity (data/file review, site inspection, or both) to be used by the Sponsor or DOE to ascertain compliance with the requirement. DOE will periodically review the Sponsor's activities and records. The Sponsor, in turn, is responsible for reviewing the activities and records of the participating contractors. *Components subject to both data/file review and site inspection are not necessarily required to receive both types of audit review during a single review period.*

## Summary of QA Verification Points

QA Option	QA Requirement	Verified by Sponsor	Verified by DOE	
			Desktop	Site Visit
1 & 2	Comply with <i>ENERGY STAR Brand Book</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1 & 2	Execute signed participation agreements with all participating contractors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1 & 2	Implement a system for collecting and responding to customer feedback	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1 & 2	Implement a conflict resolution procedure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1	Complete a data/file review of all contractor projects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	Ensure completion of on-site inspections of all participating contractors (minimum 5% sample of projects for each contractor)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1 & 2	Maintain records on quality control inspections including sampling rates, findings, corrective actions taken, and verification of conformance to specifications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Comply with self-defined and Department approved QMS elements	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Maintain records on internal quality control data collected during production including documentation of defects observed, corrective actions taken, and verification of conformance to specifications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

DOE will be working with several sponsors in late 2013 and early 2014 to pilot QMS-based QA programs. Sponsors who wish to use Option 2 should contact their Account Manager for assistance.

## General Requirements (Options 1 and 2)

The following requirements are to be satisfied by all HPwES Sponsors regardless of which QA implementation option path is selected.

### 6.1 Compliance with ENERGY STAR Brand Book

The ENERGY STAR identity is maintained by EPA and DOE and is protected as to its use and application. The requirements for working with *ENERGY STAR Brand Book* are described in detail in **Section 1** of this document. At a minimum, the Sponsor's QA program must include activities to monitor and verify compliance with the following provisions:

- **Adhere to the *ENERGY STAR Brand Book*:** As agreed to in the Program Sponsor Partnership Agreement for Home Performance with ENERGY STAR, Sponsors will abide by the EPA guideline as it pertains to mark use, marketing materials, brochures, and other uses of the mark.
- **Assure compliance of ENERGY STAR marks by participating contractors:** Sponsors must assure, through communications and quality assurance activities with participating contractors, that their participating contractors use the ENERGY STAR mark in accordance to the *ENERGY STAR Brand Book*.

### 6.2 Executed Contractor Participation Agreement

A signed Contractor Participation Agreement shall be executed by all participating contractors in the program as described in Section 3 of the *Sponsor Guide*. At a minimum, the Sponsor's QA program must include activities to monitor and verify compliance with participating contractor commitments, marketing and advertising guidance, required business practices, and verification and enforcement of qualifications and credentialing requirements.

### 6.3 Customer Feedback System

A HPwES Program quality assurance plan shall include a process for program and process review, identification of systemic lapses or weakness, and development of actions designed to strengthen the delivery of the product to the client. Customers participating in a Sponsor's HPwES program shall have access to a system that enables them to report concerns and issues directly to the Sponsor. Sponsors shall be responsible for communicating customer feedback to the affected contractors. All feedback from customers shall be documented and evaluated to inform decisions related to program operations and future program designs. Any negative feedback shall be addressed and records relating to the contractor feedback, response, and final resolution shall be maintained and made available for review by DOE or its agents upon requested.

### 6.4 Conflict Resolution Procedure

HPwES Sponsors shall develop and implement a process for responding to conflicts, complaints, or other issues identified through the customer feedback process and/or other QA activities. This process shall be in writing and include protocols for timely response, identification of responsible parties, documentation of corrective actions, results, and implementation of systemic improvements resulting from these issues.

### 6.5 On-Site Inspections

Regardless of which approach a Sponsor chooses for their QA process, some level of physical inspection of project sites will be required. At a minimum, these inspections shall be performed by technically qualified workers who have been trained on the program's quality assurance policies and procedures and inspection protocols.

Site inspections shall, at a minimum include:

- A visual inspection of the site and work conditions
- Verification that the installed measures match the contracted SOW and any change orders have been appropriately documented
- Verification that diagnostic test results are accurate (may be directly observed if the inspector is present at the time of testing or repeated by the inspector).

The Sponsor shall ensure that personnel providing technical inspections of Contractors' work are sufficiently trained and qualified to oversee this work. Inspectors shall have relevant field experience and advanced certification as well as specialized training in how to perform QC inspections. Technical skills qualification criteria for inspectors shall be established by the Sponsor to ensure that inspectors possess the knowledge, skills, and abilities to accurately evaluate the work being inspected. This criteria may include training, credentialing, licensure, documented experience, or other means of demonstrating competency as defined by the Sponsor.

### 6.6 Remedial Actions and Due Process

When deficiencies are detected through the inspection and testing process using either the QC-based or QMS-based approach, the Sponsor shall ensure that these results are communicated to the responsible party and any remedial or punitive actions taken follow a pre-defined set of protocols (due process). The Sponsor shall develop due process policies and procedures that shall be included in the QA Plan.

In addition to the items described above, the Sponsor shall select one of the following approaches for implementation of a Quality Assurance Plan:

## 6.7 QA/QC Plan (Option 1 or 2)

A QA/QC plan should describe the basic management functions for the delivery of the set of products and services provided and is designed to meet the expectations of a targeted customer.

### 6.7.1 Option 1: QC-Based Quality Plan

The HPwES Sponsor's QC-Based Quality Plan shall include, at a minimum, the following elements as described below:

- **Data/file review of reported HPwES projects:** The Sponsor shall establish and implement a system of reviewing project data submittals in paper and/or electronic form to ensure participating contractors' projects are in compliance with HPwES minimum requirements and the policies and procedures established by the Sponsor for the program. In particular, the Sponsor shall use this data review process to determine if:
  - the HPA was implemented in accordance with the requirements in Section 4 of the *Sponsor Guide*
  - the findings and recommendations from the HPA were provided to the homeowner (including costs and estimated savings)
  - the recommended improvement measures were consistent with the Guiding Principles and minimum requirements of the HPA
  - the contracted scope of work was specified using industry best practices
  - if post-installation testing was performed to verify installed-measure performance and health and safety conditions of the home post-installation.

Findings shall be recorded and maintained including documentation of corrective actions and verification of compliance with program requirements.

- **On-site inspections:** The Sponsor shall conduct physical, on-site inspections for a minimum of 5% of all HPwES projects completed by each participating contractor. On-site inspections conducted to satisfy this requirement may occur at varying stages of the HPwES project including assessment, installation, test-out, and post-completion inspections, provided a minimum of 50% of all inspections reported for each contractor represent post-installation inspections. Findings for each contractor shall be recorded and maintained including documentation of corrective actions and verification of compliance with program requirements.
- **Inspection records control:** Inspection activities, including processes, rate of inspections, findings for data review and on-site visits, corrective actions, customer feedback, and customer response shall be maintained by the Sponsor and be made available to DOE or its agents upon request.

### 6.7.2 Option 2: QMS-Based Quality Assurance Plan

Sponsors using the QMS option must describe and implement a Quality Assurance Plan (QA Plan) which includes all of the eight features listed below. Sponsors using a QMS-based approach are required to develop a complete quality assurance plan including all of these elements for their own internal policies and procedures. Sponsors are required to obtain DOE approval of the summary of this plan via the Home Performance with ENERGY STAR Implementation Plan process and/or via the Annual Report process. Periodic QA Audits conducted by DOE or its agents will be used to confirm that the Sponsor is successfully implementing and conforming to its approved QA Plan.

#### Required Elements of a QMS-Based Quality Assurance Plan

1. **Customer Needs Assessment:** Identify all customers in the HPwES program's supply chain and their associated needs targeted by the program. (For example, homeowners and utility commissioners might be two customer types identified by a Sponsor, each with differing needs.)
2. **Quality Objectives:** Describe the overarching goals the QA process is seeking to accomplish. These objectives shall relate to how the service or product meets the needs of the targeted customer and must be measurable.

3. **Roles and Responsibilities:** List of organizations and staff by category and/or title, their roles, and associated responsibilities of each individual worker type or entity acting within the supply chain and once identified, describe their impact and responsibility as it relates to quality.
4. **Product (Service) Specifications:** Define the technical specifications and metrics required to satisfy the customers' needs and meet quality objectives. Reference industry standards for home performance assessments and energy improvement installation as needed to fulfill this QA Plan element.
5. **Operations and Implementation Processes:** Describe the activities formally adopted by the HPwES program to deliver the product or service to the targeted customer(s). The implementation process will detail stages in the production and supply chain where quality objectives are measured and verified and who is responsible.
6. **Quality Validation and Documentation:** Using Quality Objectives and Product Specifications developed for the QA Plan as a basis, product and service characteristics shall be identified which can be measured to ascertain whether customer needs have been satisfied. The plan shall include procedures for validating compliance with the specifications during production and documentation of non-conformances that are identified and repaired via this process. Each worker in the supply chain shall be responsible for validating compliance with the specifications prior to closing out his or her stage of the work.
7. **Inspection and Testing:** Data reviews and physical inspections conducted by outside parties and/or management shall be used to supplement production-based quality checks. Sampling rates shall be determined based on the program's specific needs and its track record for managing quality within the production process. Inspection rates may also be adjusted based on individual contractor's track record as well. Inspection and testing protocols shall be designed to ensure defined Quality Objectives and Product Specifications have been achieved and shall be further informed by the Operations and Implementation process to ensure checks occur at critical stages throughout the supply chain.
8. **Feedback Systems:** A system of tracking and interpreting the results of production-based quality checks as well as external quality checks shall be created in order to use the data for meaningful improvements to the system. The feedback system shall be designed to inform overall process improvements targeting zero-defect production.

### QA Plan Example:

The following example is provided to illustrate how a QA Plan might be developed for a HPwES Program. The descriptions listed are by no means exhaustive but should provide a basis from which a Sponsor may begin the process of defining its QA Plan.

*Note that this example describes how a program might design a QA Plan based on the obvious end user, the homeowner, but there are other customer groups that should be considered in this process as well. For instance, your program may be subject to rules and expectations set by a public utility commission or other governmental body. Mid-stream actors such as the contractors who deliver home performance services might also be considered customers of the program. For your program to be successful, it must satisfy the needs of those customers as well as the end users (i.e. homeowners and occupants.)*

QA Plan Element	
<p><b>1. Customer Needs Assessment</b></p> <p><i>Tip: Remember to consider needs from the customer's perspective, not the program's perspective.</i></p>	<p>One of our customer groups is homeowners. Homeowners needs include: a comfortable, safe, durable home, affordable energy bills, improvements completed within budget, timely service, and a trouble-free program experience.</p>
<p><b>2. Quality Objectives</b></p> <p><i>Tip: Quality objectives must be measureable and should be indicative of the goal you want to strive for, not your tolerance for failure.</i></p>	<p>In order for our program to successfully meet homeowners' needs our objectives are to deliver:</p> <ul style="list-style-type: none"> <li>• Zero-defect installation of measures</li> <li>• A documented net improvement in home performance as measured by test-in/test-out procedures for every home participating in the program</li> <li>• 100% customer satisfaction (zero complaints)</li> <li>• Excellent customer satisfaction ratings based on survey results</li> </ul>
<p><b>3. Roles and Responsibilities</b></p> <p><i>Tip: List how each department or person in the supply chain has a potential to impact the customer and design this list in terms of each person or group taking personal responsibility for meeting the Quality Objectives. Remember that some are less obvious than others.</i></p>	<p>The departments and people within our program who impact the homeowner's experience include all of the following. <i>[A few examples of each party's associated responsibilities are also listed.]</i></p> <ul style="list-style-type: none"> <li>• <u>Marketing</u>: sets the tone for the program, messaging must resonate with</li> <li>• <u>Customer service</u>: be polite and helpful, efficiently triage customer inquiries,</li> <li>• <u>Energy assessors and installation contractors</u>: make a good impression in customer's home; conduct assessments efficiently; address both the customer's needs and desires; possess technical skills; ensure predicted results are achieved...</li> <li>• <u>Technical support</u>: ensure assessors and contractors are properly trained and customer's needs and the program's...</li> <li>• <u>IT</u>: provide systems that allow for seamless customer management, ensure</li> <li>• <u>Program management</u>: promote and support culture of self-directed</li> </ul>
<p><b>4. Product Specifications</b></p> <p><i>Tip: Product specifications for HPwES programs will primarily cover measure installation specifications but could also include criteria related to customer service, documentation and reporting, or other program-related activities.</i></p>	<p>Industry standards such as DOE's Standard Work Specifications for Energy Professionals or BPI's technical standards may provide a basis for product specifications. Programs should develop their own customer service, energy assessment, and installation requirements with detailed specifications that can be used to verify compliance. <i>[A couple of examples follow.]</i></p> <ul style="list-style-type: none"> <li>• <u>Venting of Bathroom Exhaust Fans</u>: Prior to the installation of insulation in an attic space, all bathroom exhaust fans connected to the attic space shall be vented to outside via continuous, insulated metal or flex duct. This installation shall conform to the requirements set forth in the Workforce Guidelines for Energy Professionals Standard Work Specifications Sections 6.6002, 6.6003.1d, and 6.6003.1e.</li> <li>• <u>Customer Service In-Field</u>: The technician shall wear clean disposable booties over his or her shoes at all times when working in the occupied space of the home. Booties shall be removed prior to entering attics, basements, crawlspaces or other unfinished spaces of the building and when outside.</li> </ul>
<p><b>5. Operations and Implementation Process</b></p> <p><i>Tip: This is where it all starts to come together. You are building your QA Plan using the elements developed in the first 4 steps.</i></p>	<p>Describe the process and flow of work beginning with the first touch with the customer (QA Plan Element 1) and resulting in the final product. This is the supply chain. For each stage in the supply chain, identify who is responsible (QA Plan Element 3) and how the quality objectives (QA Plan Element 2) are being met using the criteria contained within the product specifications (QA Plan Element 4.)</p>

## 6. Quality Validation and Documentation

*Tip: Validation procedures occur in-process, during production, and should include not only measurement of outcomes but also validation that the product specifications were met throughout the process. If all of the technical specifications were met but the workers failed to put booties on making the customer unhappy, then the quality objectives have not been met.*

Using the operations and implementation process (QA Plan Element 5) describe the procedures that are to be used to verify compliance with the product specifications at each stage in the supply chain. [An example is below.]

A worker is required to measure air sealing results using a blower door and document not only the measured leakage rate, but also that the testing procedure was compliant with the product specifications (e.g. configuring the house, recording pressures and flows, etc.) and that the projected goal has been met. If the goal is not met (the house is leakier than predicted) it is the worker's responsibility to identify the cause and remedy the situation before completing the job (find the hole that was missed and seal it.) If the predicted leakage rate cannot be achieved after all other criteria for an air sealing job have been satisfied (all the holes have been sealed,) the worker is responsible for documenting the situation so it can be evaluated in terms of the complete process to determine the cause and develop a different kind of remedy (correct the methodology used to predict air leakage reduction from air sealing or retrain the energy assessors.)

## 7. Inspection and Testing

*Tip: The inspection and testing process is distinct from the quality validation process in that the people checking the data and work are third-parties to the work itself. These checks may occur in-process while work is being done, or post-installation. Use of automated data error detection and other analytics may also serve this function.*

Establish protocols for conducting quality control checks that are external to the regular production process. These protocols should include validity checks based on the criteria described in the product specifications (QA Plan Element 4) and be consistent with the quality validation procedures (QA Plan Element 6). Define who is responsible for conducting these inspections and tests, sampling rates, and frequency. Tests may include automated data checks, manual data reviews, and physical inspections. Documentation of errors and defects should be consistent with the quality validation procedures (QA Plan Element 6).

## 8. Feedback System

*Tip: This is a continuous improvement process.*

Establish procedures for reporting of results (from QA Plan Elements 6 and 7) back to the program; processing of non-conformities, errors, and defects to identify the root causes; and procedures for implementing and documenting solutions.

## Section 7: Tracking and Reporting

### Minimum Home Performance with ENERGY STAR Program Requirements Checklist: *Tracking and Reporting*

- 7.1** Collect data and report results to DOE using Quarterly Data Reporting template provided, including:
- Verified and updated list of participating contractors including status (active, probation, inactive) and the contractor's primary point of contact for accessing marketing materials
  - Number of projects completed by each contractor within the reporting period
  - Number of field inspections completed for each contractor within the reporting period, including at which point during the project the inspection was completed (assessment, measure installation, test-out, or post-installation)
  - Number of projects completed by the program within the reporting period disaggregated by project type: single family vs. multifamily, and an indication of how many reported projects included only program subsidized direct install measures
- 7.2** Collect data and report results to DOE using Annual Data Reporting template provided, including:
- Verified and updated contact information
  - Verified and updated program URL and description for HPwES website
  - Updated program implementation plan elements
  - Summary results of preceding program year
  - Summary goals for upcoming program year

Tracking and reporting on progress in developing and implementing Home Performance with ENERGY STAR (HPwES) programs is a requirement for Sponsors. Data Sponsors provide allows DOE to review and analyze movement towards goals, trends, and lessons in implementation of HPwES. Collection of quarterly and annual reports is part of DOE's quality assurance for the national implementation of HPwES. The process also informs DOE's deployment strategy by identifying where and how best to support Sponsors and industry. Reports enable DOE to track program success, identify inactive partners, inform enhancements to online tools and resources, and recognize achievements (e.g., ENERGY STAR Awards and Century Club Contractors). Furthermore, analysis of these data enable DOE to understand with better clarity the residential energy, improvement, and real estate markets so that it can provide timely and independent feedback back to those markets. The data reported by Sponsors will be aggregated and used in publishing information on the HPwES Program's progress on the energystar.gov website, HPwES newsletter, and other program reports.

## Minimum Requirements

### 7.1 Quarterly Report Requirements

Sponsors are responsible for tracking program activity and reporting results to DOE on a quarterly basis. Sponsors shall provide this data using templates provided by DOE. Data reported on a quarterly basis includes a listing of participating contractors, their current status in the program (active, inactive, probation), and a designated point of contact for accessing marketing materials. Once a Sponsor has completed this data reporting process the first time, DOE will provide pre-populated templates for subsequent reporting periods. The pre-populated forms require that Sponsors simply verify and update existing data rather than recreate it with each reporting period. Quarterly data submittals are based on the calendar year and are due thirty days following the close of the reporting period and include all of the following:

- Verified and updated list of participating contractors including status (active, probation, inactive) and a primary point of contact for accessing marketing materials
- Number of projects completed by each contractor within the reporting period
- Number of field inspections completed for each contractor within the reporting period, including at which point during the project the inspection was completed (assessment, measure installation, test-out, or post-installation)
- Number of projects completed by the program within the reporting period disaggregated by project type: single family vs. multifamily, and an indication of how many reported projects included only program subsidized direct install measures.

### Key Reporting Terms:

**Completed HPwES Project:** encompasses the complete work cycle in which HPwES services are provided to a customer for a specific household. For purposes of reporting data to DOE, a completed project may be counted for each independent contract executed between the homeowner and a qualified participating contractor or other signatory designated by the Sponsor, which meets all program requirements including documentation of test-in and test-out results related to the scope of work completed under that contract.

**Field Inspection:** A field visit by an independent inspector to assess compliance with program standards. The visit could be at any stage during the HPwES project but the sample set should include some post-improvement inspections (refer to Section 6 on Quality Assurance).

### Contractor Status:

- **Active:** A fully participating contractor that is enrolled and eligible to produce projects in the program; these participating contractors are eligible to have access to use of the Home Performance with ENERGY STAR mark and tools on My ENERGY STAR Account (MESA)
- **Inactive:** A participating contractor that is no longer participating in a local program. Inactive contractors may self-withdraw from participation and/or may become ineligible to participate due to non-compliance with program requirements or any other delisting at the Sponsor's discretion; inactive contractors are not eligible to use of the Home Performance with ENERGY STAR mark and tools on MESA.
- **Probation:** any interim status where a contractor may be in between Active and Inactive; a contractor under a probationary status may be producing work in the program but is not fully enrolled or is under observation.

The Quarterly Report Template is a simple and easy to use Microsoft Excel workbook. Retroactive adjustments are allowed only for the two preceding quarters. If it is necessary to make changes to older data, the Sponsors should contact their Account Manager.

## 7.2 Annual Report Requirements

Sponsors shall report to DOE no later than first quarter of each calendar year, or as requested by their Account Manager, whichever is earlier. An Annual Report Template will be provided to all Sponsors at the beginning of each calendar year. Annual data is based on the calendar year and includes all of the following:

- Verified and updated contact information
- Verified and updated program URL and description

**A reminder for quarterly reports will be issued one month after the close of a quarter. Sponsors should provide their quarterly reports following this schedule:**

Q1	Jan.-March	April 30th
Q2	April-June	July 30th
Q3	July-Sept.	October 30th
Q4	Oct.-Dec.	January 30th

for HPwES website

- Updated program implementation plan elements
- Summary results of preceding program year
- Summary goals for upcoming program year.

DOE is interested in gathering information on the previous year's results, as well as plans for the upcoming year. The Annual Report questions are designed to coincide as much as possible with the data Sponsors normally collect and information that is readily accessible to the Sponsor's implementation team. As detailed in [Section 2](#), submittal of Annual Reports will meet requirements for annual updates to a Sponsor's Implementation Plan. As Sponsors and their implementation team complete the Annual Report, any questions can be directed to their Account Manager.

## Referenced Website URLs

<sup>i</sup> [http://www.energystar.gov/index.cfm?c=logos.pt\\_guidelines](http://www.energystar.gov/index.cfm?c=logos.pt_guidelines)

<sup>ii</sup> [http://www.energystar.gov/index.cfm?c=web\\_tools.pt\\_linking\\_policy](http://www.energystar.gov/index.cfm?c=web_tools.pt_linking_policy)

<sup>iii</sup> [http://www.energystar.gov/ia/home\\_improvement/downloads/HPwES\\_Partnership\\_Agreement.pdf?521c-619f](http://www.energystar.gov/ia/home_improvement/downloads/HPwES_Partnership_Agreement.pdf?521c-619f)

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For more information, visit:  
[energystar.gov/hpwes](http://energystar.gov/hpwes)



DOE/EE-1056 • March 2014

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