Request for Feedback on Proposal to Strengthen the ENERGY STAR Certification System’s Quality Assurance and Quality Control Requirements

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# Introduction

When the U.S. Environmental Protection Agency (EPA) first developed the *ENERGY STAR Certification System for Homes and Apartments Using an Energy Rating Index or Dwelling Unit Modeling Compliance Path[[1]](#footnote-2)* in 2018, it included requirements for Home Certification Organization (HCO) “Quality Control Protocols”.[[2]](#footnote-3) Since that time, compliance matters have brought additional information to light that suggests room for improvement in those requirements. In addition, the 45L tax credit’s newfound reliance on the ENERGY STAR program is expected to put the quality and reliability of ENERGY STAR certifications under greater scrutiny than ever before.

Based on this, EPA believes it is necessary and appropriate at this time to strengthen the ENERGY STAR Certification System’s quality assurance/quality control (QAQC) requirements. This document lays out a draft proposal designed to improve the effectiveness of current QAQC activities, give HCOs new tools to oversee participants operating in their ENERGY STAR certification programs, and ultimately create more confidence in the quality of ENERGY STAR certifications.[[3]](#footnote-4)

As the day-to-day implementers of the program, EPA greatly values HCOs’ input on this important effort. This preliminary concept is being provided in the spirit of spurring discussions with our HCO partners. EPA would value feedback on the proposed elements described below, as well as welcome any new or alternative ideas for achieving the same outcomes via other means. At this stage, EPA seeks feedback on the broad concepts and direction of the proposal. Based on this feedback and additional discussions with HCOs, EPA will prepare detailed edits to the Certification System document, which will ultimately be made available for public stakeholder feedback. Finally, EPA will set reasonable timelines for implementing any new requirements, recognizing that some elements may require more time to put into practice than others.

# Opportunities to Improve the ENERGY STAR Certification System’s QAQC Requirements

EPA believes the Certification System’s current requirements suffer from two major shortcomings that result in a diminished level of confidence in ENERGY STAR certifications. First, Field Reviews, which serve as the sole Quality Control approach on installed measures, are statistically compromised because the home selection is not required to be unannounced, random, and unbiased.[[4]](#footnote-5) In fact, from a logistical standpoint, it is difficult to imagine how these site visits could ever be unannounced, since the QC reviewer must ensure the Rater is available on the date of the visit and, if remote, make travel arrangements in advance. Relatedly, Raters would typically be responsible for arranging physical access to a limited set of dwellings that happen to be at the pre-drywall or final construction stage at the time of the site visit. The result is a home selection process that is subject to bias (conscious or unconscious) because it is under the influence of the Rater whose work is being reviewed.

The second shortcoming is a failure of the Certification System to specify adequate data collection and data review processes at the HCO level, especially for ENERGY STAR-specific data points (as opposed to ANSI/RESNET/ICC 301), and most acutely for ENERGY STAR’s documentation requirements (as opposed to installed measures). The Certification System’s minimal requirements for centralized ENERGY STAR data collection limits HCOs’ insight into certifications occurring through their programs, impedes their ability to respond to compliance matters in a timely matter, and fails to create a credible threat of discovery for non-compliant practices.

Besides addressing shortcomings, EPA sees opportunities to proactively advance minimum requirements in areas where HCOs, software developers, and Energy Rating Companies have propelled technologies and standards of practice beyond the Certification System’s current requirements. Where appropriate, EPA seeks to take better advantage of current technology and formally recognize best practices that are already being applied in the marketplace.

# Discussion Draft of Enhanced Quality Control Requirements

EPA proposes the following categories of improvements to overcome the current shortcomings identified above.

## HCO centralized collection of ENERGY STAR checklist data

The first element is for HCOs to centrally collect ENERGY STAR checklist data for 100% of homes at the time of certification, just as the HCO databases have historically collected ANSI 301 minimum-rated features.[[5]](#footnote-6) While schema-based data interchange is preferred, it may be necessary to support PDF and scanned documents as an alternative. If useful, EPA could develop data schemas (XML, XSD), stylesheets (XSL), and “business rules” to allow third-party software and HCO systems to work with digital versions of the ENERGY STAR checklists in a consistent manner, roughly similar to IRS’s [Modernized e-File program](https://www.irs.gov/e-file-providers/modernized-e-file-program-information).

## HCO centralized collection of Rater photos

The second element is for HCOs to centrally collect on-site photographs captured by Raters, including those photos required by ANSI/RESNET/ICC 301 Normative Appendix B, as well as a new set of approximately 10-15 photos covering key ENERGY STAR dwelling unit and (if applicable) common space mandatory measures such as range hoods being exhausted to the outdoors. The collection of photos at the HCO level would both create a credible threat of discovery and enable the next element below.

## Shifting quality control of installed features to the File Review step

Instead of relying on the on-site “Field Reviews” to perform quality control of installed measures, this task could be accomplished during the existing File Review step using the checklist data and rater photos referenced above. No change to the existing File Review frequency is proposed. Because the documentation and photos would be centrally collected for all homes, quality control selection could occur at random, in an unannounced fashion, outside the influence of the Rater being evaluated. When a quality control review identifies errors, the availability of the documentation and photos would allow expanding the review to additional homes as warranted.

Although the quality control of installed features would be shifted to the File Review step, the on-site ‘Field Review’ still serves a valuable purpose and would continue to be required at a defined frequency, though it would be reframed as a Rater ‘skills and knowledge’ check. Because this would be more of a quality assurance activity focused on the Rater’s abilities, rather than a quality control activity focused on compliance in a particular home, the statistical validity of the home selection would be largely unimportant.

## HCO direct (non-delegated) quality control review

The fourth element is for HCO personnel to directly perform quality control File Reviews on 1% of ENERGY STAR certifications directly to ensure consistency and objectivity across that HCO’s participant base. Note that this is additional to the current 10% File Review step, which HCOs could continue to delegate to approved designees, if desired. To allow this HCO File Review to occur at the time of certification, HCO systems would automatically flag 1% of ENERGY STAR certifications for ‘further review’ at random.[[6]](#footnote-7) The other 99% could result in immediate certification, just as is the case today.

## Printing ENERGY STAR certificates and labels exclusively through approved rating software

Over the years, EPA made available templates and, later, an Excel-based ‘label printing tool’ that allowed Energy Rating Companies to print ENERGY STAR labels and certificates with no controls on data quality or accuracy. In addition, EPA is aware that some Energy Rating Companies have integrated the printing of ENERGY STAR label/certificate assets into their proprietary IT systems (without EPA permission, but also in the absence of a formal policy forbidding it). All these methods allow labels and certificates to be printed with no assurance that those homes are reported to the HCO database or meet program requirements like the ERI target. To close this loophole, EPA would explicitly prohibit printing labels and certificates through any means other than the approved rating software.

EPA may also consider additional changes to its label/certificate design to prevent counterfeiting, such as the inclusion of a QR code linked to the HCO’s online certification records. Alternatively, EPA would have no objections to HCOs taking on responsibility for label/certificate printing directly, taking the Energy Rating Companies out of the loop entirely. Finally, EPA is receptive to the idea of eliminating the printed label altogether and relying solely on an online repository of certification information accessible by the homeowner. However, outreach with builder partners would be necessary to better understand how much value they place on the physical label and certificate.

## Formalized list of automated validations in approved rating software, HCO database, and HOST API

Approved rating software has traditionally included several validations for compliance with ENERGY STAR measures, such as meeting the ENERGY STAR ERI target or the mandatory duct tightness level, but implementation is inconsistent across software systems. More recently, EPA defined certain validation conditions in its Homes Online Submission Tool (HOST) API, such as a dwelling unit’s home type matching eligibility requirements (e.g., a multifamily dwelling unit should use the Multifamily New Construction Program). As a practical necessity, these HOST validations have informally filtered down to the HCO database and, to a lesser degree, the approved rating software.

EPA proposes to formalize a list of required validations at each level of the reporting stack (rating software, HCO database, and HOST API). This would improve the consistency of the existing validations, and EPA would also look for opportunities to introduce new validations to cover a more complete set of the program’s requirements. Examples include validating program Version eligibility based on a home’s location and permit date and verifying builder and Energy Rating Company ENERGY STAR partnership using EPA’s Partner List API.

Additionally, EPA understands that some HCOs employ data visualization software to periodically perform a ‘red flag’ analysis on their home repository database. The purpose of this analysis is to identify potential data outliers that warrant further investigation. EPA welcomes HCOs’ perspectives on whether the Certification System should require this type of analysis and, if so, what objective criteria and frequency are recommended.

## Periodic HCO audits of rater companies and Providers

EPA understands that both approved national HCOs perform periodic company-level audits (or “Quality Assurance record review”) on a percentage of participants. While the Certification System includes a general requirement for adequate controls to oversee designees, it is currently not prescriptive on how this is accomplished, or at what frequency. EPA welcomes HCOs’ perspectives on whether the Certification System should require company-level audits and, if so, covering which entities and at what frequencies.

# Feedback Questions

## General

* Do you have concerns that any of the proposed elements would fail to deliver their intended benefits?
* Can you foresee any unintended negative consequences from implementing any of these elements?
* Are there significant implementation challenges for any proposed elements that EPA needs to consider?
* Do you have suggestions for additional/alternative measures that could provide the same or more benefits that EPA should consider?

## HCO centralized collection of ENERGY STAR checklist data

* Based on existing market technology, is it reasonable to expect Raters to use digital form software to complete checklists and transmit data to the rating software and HCO databases, or will it be necessary to support digital PDFs and/or scans of paper checklists?
* Would it be useful for EPA to develop data schemas and stylesheets akin to the IRS’s Modernized e-File program?
* For the sake of consistency, when digital form software is used by Raters to complete the ENERGY STAR checklists, should EPA require that it be based on an EPA-created data schema/stylesheet? Should EPA require HCOs to operate a review and approval process for such form software to ensure ENERGY STAR checklists are accurately translated to digital formats?
* Are HCO databases and approved rating software technically capable of keeping up with an annual revision schedule to ENERGY STAR’s program documentation and, therefore, data schemas?
* How long would HCOs need to implement centralized collection of ENERGY STAR checklist data?

## HCO centralized collection of Rater photos

* Beyond mandatory program measures, are there other photos that would provide significant QAQC value, such as elevation photos or Rater ‘selfies’ during the on-site inspections?
* How might revised Certification System requirements accommodate situations where mandatory photos are unavailable, for example, due to accidental data loss?
* How long would HCOs need to implement centralized collection of Rater photos?

## Shifting quality control of installed features to the File Review step

* Given the additional credible threat of discovery created by the central collection of checklist and photo data, is it still appropriate to require the File Review at a 10% rate or would a different rate be warranted?
* Assuming that selection of homes for the 10% File Review is required to be verifiably randomized, how might HCOs enforce that requirement?
* Are there any reasons File Review should not be required to occur prior to a rating being uploaded to HCOs for certification?
* With the QA field visit reframed as a ‘skills and knowledge’ check, is it still appropriate to require this at a rate of 1% of homes completed by the rater? Would it be more appropriate to change the criteria to a fixed amount per rater per time period? If so, what frequency is recommended?
* Relatedly, should this check require an assessment at both the pre-drywall and final stages (either at separate homes or via separate field visits), considering that each type of inspection requires different skills and knowledge?
* Again, considering the reframing as a ‘skills and knowledge’ check, could this check be accomplished effectively using remote video protocols? Is a minimum threshold of in-person, on-site review necessary or appropriate?
* How long would be needed to update standards and train QA personnel/designees on the adjusted scopes for the File Reviews and reframed ‘skills and knowledge check’ field visits?

## HCO direct (non-delegated) quality control review

* Though most File Review could continue to be delegated, EPA is proposing that HCO staff directly perform a minimum percentage of the File Reviews. Is 1% of homes an appropriate rate for direct HCO review? If not, what frequency is recommended?
* Should that 1% for direct HCO review be selected from the full pool of ENERGY STAR certifications, or the 10% subset of home files that already received File Review by the QAQC delegate (if applicable)?
* Given that selection for the 1% HCO File Review would be randomized by the HCO’s IT system, is it necessary to further prescribe the distribution of this review, such as requiring it be applied ‘by Rater’?
* Knowing that pressures exist to deliver certifications as soon as possible, are there methods available to perform an HCO direct quality control review quicker than two days or earlier in the process?
* How long would HCOs need to implement direct (non-delegated) quality control review?

## Printing ENERGY STAR certificates and labels exclusively through approved rating software

* Should QR codes be added to the ENERGY STAR labels and/or certificates linking directly to that home’s public record on the HCO website?
* Would HCOs prefer to have sole responsibility for the printing of labels and/or certificates?
* Do HCOs have a perspective on whether the physical ENERGY STAR label and/or certificate should be eliminated altogether?
* Is January 1, 2025 a reasonable timeline by which to require all participants to print labels and certificates through approved rating software?

## Formalized list of automated validations in approved rating software, HCO database, and HOST API

* Which validations, either on ENERGY STAR requirements or ANSI 301, are currently included in HCO database systems?
* Should the Certification System require HCOs to perform data visualization analysis (also known as ‘red flag’ analysis)? If so, what objective criteria are recommended for this activity and at what frequency should it be required?
* How long would HCOs need to integrate a formalized list of automated validations in the HCO database systems and, separately, to begin performing formalized data monitoring/visualization?
* What is an appropriate deadline to require validations be included in approved rating software?

## Periodic HCO audits of rater companies and Providers

* Are HCO company-level audits an effective method for overseeing designee activities, and would it be appropriate to make these audits a default requirement?
* Should company-level audits apply to all entities with designated responsibilities in an HCO’s certification program (Energy Rating Companies, QA designees, training providers, etc.)?
* What would be the recommended scope and frequency of the audits?
1. Find the current revision of the ENERGY STAR Certification System at: <https://www.energystar.gov/partner_resources/residential_new/working/other_participants/hco/become_hco> [↑](#footnote-ref-2)
2. For the purposes of this document, “quality control” refers to processes that evaluate the end product, which, in this case, are the homes being certified as ENERGY STAR. File Review and Field Review are examples of quality control activities. In contrast, “quality assurance” will be used to refer to efforts that are focused on the certification *process*, including things like training, credentialing, and equipment calibration. [↑](#footnote-ref-3)
3. In addition to this QAQC proposal, EPA also identified quality-driven improvements to its technical specifications, which it is actively evaluating for rollout over the next two annual program revisions. [↑](#footnote-ref-4)
4. Field Reviews suffer from a third flaw as a quality control measure in that they may theoretically occur up to a year after a home is already certified, at which point there are no good options to address any deficiencies discovered. As a general principle moving forward, EPA believes that all quality control activities should be completed at the time of certification (with “quality control,” again, being defined as activities focused on the compliance of a particular home). [↑](#footnote-ref-5)
5. Note that the ENERGY STAR Multifamily New Construction (MFNC) checklists are completed at the building-level and cover all common spaces and units in that building. For MFNC, the proposed minimum requirement is to centrally collect a single copy of the building checklist, as long as it can be associated with each unit contained in that building. Relatedly, note that EPA is planning to add a requirement for explicit building-level tracking in MFNC projects (e.g., via assignment of a unique Building ID, in addition to the current unit-level IDs). [↑](#footnote-ref-6)
6. EPA’s intent is for the Certification System’s required QC rates to be calculated based on the pool of ENERGY STAR certifications, as opposed to the full set of homes submitted to an HCO (many of which may not be ENERGY STAR certified). EPA acknowledges this intent is ambiguous in the current Certification System document and intends to clarify this requirement as part of these updates. [↑](#footnote-ref-7)