



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

July 11, 2022

Dear ENERGY STAR® Smart Thermostats Partner or Other Interested Party:

With this letter, the Environmental Protection Agency (EPA) is pleased to share the first draft of a Version 2.0 ENERGY STAR specification for smart thermostats and the method to demonstrate field savings.

The current criteria for recognition have been in place since 2017. EPA monitors market and technology developments and reviews specifications regularly, looking to capitalize on opportunities for additional energy savings. EPA sees an opportunity to improve the ENERGY STAR specification for smart thermostats and to expand scope to realize additional energy savings. EPA thanks stakeholders for their comments on the discussion guide, and engagement in subsequent conversations about improving the specification and method. The Draft 1, Version 2.0 ENERGY STAR Smart Thermostat product specification reflects what EPA learned through this process.

Noteworthy updates to the specification include:

- EPA proposes to refer to the product category as ENERGY STAR Smart Thermostats (rather than Connected) because more consumers recognize the term and to reduce confusion with communicating thermostats.
- EPA proposes to expand the scope of the ENERGY STAR specification to include line voltage thermostats as the potential savings gained by setting back temperatures are compelling. Based on exploratory discussions with vendors, the current metric seems to work. EPA proposes harmonized criteria for hardware testing with CSA 828:19 standard. EPA expects immediate participation in the product category from providers that currently have products in the market and for the number of participants and product availability to grow over time.
- EPA has clarified that products intended to control mini-splits and other variable speed heating and cooling equipment are out of scope. The assumptions underlying the ENERGY STAR savings metric are questionable or invalid for variable speed equipment, and EPA has been unable to identify any reliable method for ensuring thermostats optimize the capabilities of such equipment.

Changes related to the method to demonstrate field savings include:

- Software updates will allow installations where thermostats control two stage heating and cooling equipment to be included in the sample used to evaluate the thermostat. For some vendors, up to a third of their thermostats are in in such installations.
- EPA proposes several changes to increase the stability and reliability of the savings analysis results, including:
 - Requiring minimum performance on the resistance heat utilization metric, ensuring that installations controlling heat pumps cannot achieve high savings metric scores while wasting energy using resistance heat to recover from deep setbacks.
 - Increasing maximum sample size.

- Implementing a two-stage check for data completeness: installations with 95% of data or with enough complete days in the core season will be analyzed.
 - Instituting a minimum sample size (after filtering).
 - Requiring at least 30% of installations in the random sample to be reliably analyzable by EPA software.
- To assist vendors in meeting new requirements for sufficient installations in the sample, EPA has improved error logging such that it will be considerably easier to understand why each thermostat eliminated from analysis was not included.
 - For additional ease of use, the Version 2.0 software splits the output files into a certification file containing the information required to fulfil the certification requirements in the specification and a separate summary statistics file to evaluate the performance metric. Other changes make the software faster, easier to use, and more reliable.

Additional information about all the proposed changes is included in note boxes throughout the Draft 1 specification and test method.

EPA also received valuable feedback on the discussion guide recommending detailed changes to the method to demonstrate field savings, and to the program, which we did not have resources to evaluate. Suggestions included changing to International Energy Conservation Code (IECC) instead of Building America climate zones, differentiating sample size criteria by whether the sample was for initial certification or resubmission, weighting the various climate zones differently, and developing a test method to confirm device response to demand response requests. EPA appreciates this detailed feedback from the stakeholders but notes that these updates are a major lift requiring significant analysis and resources. At this time, the Agency is constrained by funding and cannot pursue these suggestions. We welcome stakeholder effort to fully evaluate their potential and will strive to work with any stakeholders interested in pursuing this.

Comment Submittal

As with all ENERGY STAR specification development and revision efforts, EPA is committed to a transparent, open, and inclusive process with the intention of creating a high quality, stakeholder supported specification. Stakeholders are encouraged to provide written comments for EPA consideration to connectedthermostats@energystar.gov by August 19, 2022. All comments will be posted to the ENERGY STAR Smart Thermostats Product Development website unless the submitter requests otherwise.

Stakeholder Meeting

EPA will host a stakeholder webinar on July 21, 2022 from 1 to 3 pm EST to discuss the proposed criteria and address initial stakeholder comments and questions. Stakeholders interested in participating in this discussion should register [here](#) by July 20, 2022.

Please direct any questions specific to the connected criteria to Abigail Daken at EPA, Daken.Abigail@epa.gov, or 202-343-9375, Abhishek Jathar at ICF, Abhishek.Jathar@icf.com or 202-862-1203.

Thank you for your continued support of the ENERGY STAR program.

Sincerely,



Abigail Daken
EPA Product Manager, ENERGY STAR for HVAC and Connected

Enclosures:

ENERGY STAR Draft 1 Version 2.0 Smart Thermostat Specification

ENERGY STAR Version 2.0 Method to demonstrate field savings