

October 27, 2015

Ms. Abigail Daken
US Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, DC 20460

Dear Ms. Daken:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the *Basic Demand Response Criteria Draft 1 Version 1.0 ENERGY STAR® Program Requirements for Connected Thermostats Products* released by the Environmental Protection Agency (EPA) on September 1, 2015.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 45 US states, the District of Columbia, and seven Canadian provinces. In 2013, CEE members directed nearly \$6.4 billion of the \$8 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so it may continue to serve as the national marketing platform for energy efficiency. We wish to recognize the significant contribution of the Electric Power Research Institute (EPRI) towards the development of these comments, particularly with regard to identifying DR functionality that will yield grid benefits.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

We have restated our original comments, which still stand, and also provided detailed input on the proposed Demand Response criteria.

We Laud EPA's Stated Objectives, But Are Unsure if a Measurable and Reproducible Basis for Savings is Possible

CEE lauds EPA's continued effort to credibly distinguish opportunities for energy savings within the HVAC controls market. In particular, we agree that this area would benefit the consumer if the energy savings claims of thermostat manufacturers could be credibly compared, and if stakeholders could accurately predict the energy savings resulting from the installation and use of a communicating thermostat. The federal government is likely well positioned to credibly assess the savings potential of connected thermostats and to determine if a viable test procedure is possible. However, we question whether it is premature to propose an ENERGY STAR label given the need to define a credible metric for characterizing performance.

The ENERGY STAR logo is a powerful market tool for differentiating efficient products, but it does not yet appear that there are sufficient grounds for including connected thermostats into the portfolio at this time. Several issues must be addressed before CEE members can assess if and how ENERGY STAR should enter the market. Specifically, members have questions regarding the ability of ENERGY STAR to:

- Consistently deliver cost effective savings to the consumer that persist throughout the lifetime of the product;
- Deliver savings with no compromise in customer amenity or satisfaction; and
- Effectively differentiate the highly efficient products from standard efficiency products

CEE is therefore concerned about the potentially negative impacts that may arise from introducing a specification in this area until these issues are better resolved. We support EPA's investigation and ongoing pursuit of connected thermostats; however at the given time, with the absence of foundational elements to provide credible consumer guidance, we cannot support the use of ENERGY STAR for this category of products.

We look forward to working with EPA to address questions raised by program administrator.

If EPA Ultimately Labels Thermostats, Additional Communication Requirements Will Expand the Number of DSM Administrators Who May Promote ENERGY STAR

A subset of CEE members believe a modular port (or some other means to ensure local access through open standards) would not add immediate value, and/or acknowledge some thermostat manufacturers are unlikely to comply at this time. It is anticipated that certain vendors will prefer

to set-up a remote data center and keep the communication to the device private or proprietary. In such cases, utility signals for demand response would have to route to the data-center, and then the vendor would signal the devices in a proprietary manner. We recognize allowing this approach could leave room for innovative approaches for delivering DR in the future. However, even within this scenario, there is a desire to achieve better definition around what qualifies as an open API, and to at least specify the use of Demand Response application layer open standards like OpenADR 2.0 or SEP 2.0 while allowing manufacturers to ultimately select the physical layer. Ensuring Open APIs are available from product providers will enable utilities to work with aggregation providers to create large open platforms that can incorporate many products within a given service territory.

Other members believe a modular port (or some other means to ensure local access through open standards) would provide the flexibility needed to enable connectivity within the physical premises of the building and would ultimately increase both the number of organizations and the type of DR programs that could leverage thermostats meeting EPA's proposed requirements. Further, adding this requirement would align with California's building code, increasing the value of labeled products for DR programs conducted within in that state. Another consideration relates to data sharing. Many CEE members need communicating thermostats to communicate data via open standards in order to demonstrate value and justify promotion and/or partnership. As DSM administrators deploy "bring your own thermostat" programs, there will be a need to collect and process big data from numerous manufacturers. Ideally, this data sharing will be automated. Open, local access would help ensure that the thermostats do not become inaccessible if a given manufacturer or service provider goes out of business, or chooses to charge consumers a fee for maintaining a cloud-based connection that decrease program participation.

Regardless of whether access is local or remote (or both), we believe the communication protocols should be standards held and managed by an ISO-recognized standards organization such as IEC, ANSI, IEEE, etc., rather than only relying on vendor-defined APIs. We believe requiring standards in no way limits functionality or impedes creativity. Standards ensure that a certain basic set of physical and information responses are possible, while allowing vendors to employ any number of additional non-standard approaches. Open data standards that define the data parameters that will be provided by these devices for EE and DR program verification will also enable greater understanding of energy efficiency potential. Reinstating the requirement for an Open API from Draft 1 of the Climate Control specification, with the basic data and control parameters passed through the Open API, would support this desired outcome.

Allowing Customers to Redefine EPA’s Temperature Restrictions—or Simply Requiring Thermostats are Capable of Establishing Temperature Restrictions without a Default Setting—Would Enhance the Value of Labeled Thermostats in Many Jurisdictions

EPA has stipulated that under no circumstances may the temperature in the home go below 50F or above 85F. We do not anticipate situations where DR programs would allow a home to fall below 50F. However, member experiences have differed with regard to allowing homes to become too warm. In programs in Maryland and Arizona, DR programs have allowed household temperatures to exceed 90 F (likely while the consumer wasn’t home) and retained successful levels of participation that yielded grid benefits and financial savings to the consumer. In the Midwest, it was determined by one utility that any communicating thermostat must at least offer the customer the ability to establish a maximum temperature that may not be exceeded. This requirement was the result of consumers indicating “the house getting too hot” was the biggest obstacle to DR program participation, and the feedback that consumers didn’t expect their home to stay above 90F into the evening. Members in California suggest that ENERGY STAR should eliminate these protections, or at least adopt language consistent with their building code that allows consumers to easily choose alternative temperature restrictions. We are concerned the proposed requirements may reduce consumer choice and the DR potential afforded by labeled thermostats. One option for maintaining comfort while achieving the desired demand reduction (at least in some homes with gas or oil heating) would be to encourage a non-electrical fuel source to maintain comfort during a winter demand response.

For Type 1 Response, Consider Adding Cycling Response Guidelines to the Default Temperature Responses (or Eliminating the Default Temperature Response Entirely) to Enable Additional, Potentially More Stable, Load Reductions

For a “Type 1” planned day-ahead DR response, EPA has proposed a default setpoint offset of +4F (cooling) and -4F (heating) with a minimum duration of 4 hours. We assume the default is there in case customers do not set their DR preferences. We believe that all communicating, DR-ready thermostats should have the ability to allow the utility and consumer to control how much their thermostat responds. Some CEE members are concerned that setting this default response may limit the DR opportunity, and that focusing more on configurability and enabling the utility

and consumer to control how much their thermostat responds is preferable. Ideally labeled thermostats would allow DR providers to offer different options based on the different customer segments, which are likely to vary based on the physical location of the customer and their lifestyle preferences. Customization and ease of changing any default temperature response established by EPA is paramount. One member indicates that if EPA maintains a default set-point offset for up and down temperature, there would ideally be two different options: +2F/-2F and +4F/-4F. However, they are concerned that even requiring these two types would not align with DSM industry needs, and do not map well with existing DR protocols. A small set of common DR messages do exist and are represented cohesively in DR protocols including OpenADR, SEP2, and CEA-2045. These common messages include duty-cycling, variable power levels (e.g. for variable speed drives), and price. DR standards include event duration fields so that DR events can be set to the actual duration of the need.

For Type 2 Responses, Consider Requiring a Longer Duration Time

For a “Type 2” fast, spinning reserve response, EPA has proposed the response must be maintained for at least 10 minutes. In some jurisdictions, a longer response time will yield greater DR benefit. For example, in New England there are 10 and 30 minute reserve markets. Members believe that labeled systems should be required to respond within 10 minutes, but would encourage EPA to elaborate on the basis for selecting a 10 minute response duration for HVAC systems, and consider increasing the minimum duration specified to either 20 or 30 minutes. Further, the DR administrator should have the right to terminate the event in midstream and restore the thermostat to its setting prior to the event request.

Questions We Recommend EPA Explore Further

- In heating mode, products that are controlling conventional heating sources (typically oil or gas) are not required to respond. Why did EPA choose not to include gas? What if there is a gas DR program offered by the gas utility; shouldn't the labeled thermostat be able to assist regardless if its gas or electric? Gas utilities currently do have some constrained areas which are subject to curtailment in the winter critical time. Currently, residential customers are less likely affected than commercial customers.
- We note that the product is not required to respond to more than one Type 1 signal per rolling 24 hour period. Why did EPA establish this “rolling” requirement? Current DR administrators indicate that customers may have obligations with their utility or 3rd party DR provider that would differ from this requirement?
- How will EPA prevent the use of electric resistance strip-heat immediately following a DR event? Members in areas with a winter peak believe a thermostat must have some way to avoid turning on the electrical strip heat immediately after a DR event is completed in an effort to quickly return the conditioned space up to the pre-event temperature. Without

this type of strip heat lock out or avoidance then labeled thermostats will present a less valuable, less efficient, and less predictable grid resource- at least in areas where heat pumps have a high penetration rate.

CEE would once again like to thank the EPA for the opportunity to comment on *Basic Demand Response Criteria Draft 1 Version 1.0 ENERGY STAR® Program Requirements for Connected Thermostats Products*. Please contact CEE Deputy Director John Taylor at 617-532-0944 with any questions about these comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ed Wisniewski".

Ed Wisniewski, CEE Executive Director