



May 17, 2019

***NRDC Comments on ENERGY STAR Water Heaters Specification – Draft 1
Version 3.3***

On behalf of the Natural Resources Defense Council (NRDC), a leading environmental advocacy group with over 3 million members and on-line activists, we respectfully submit these comments on ENERGY STAR’s Draft 1, Version 3.3 specification for residential water heaters. In summary, we strongly support EPA’s proposal which adds grid connectivity requirements specific to water heaters to the ENERGY STAR specification for residential water heating products. Below we provide background on the importance of this issue along with a few recommendations on how to improve some of the definitions and protocols, and our long-term vision for the ENERGY STAR residential water heating specification and market.

Background: Water heating represents approximately 18% of the average home’s annual energy consumption according to the Energy Information Agency (EIA 2013) and in most cases is the second biggest source of energy load in the home after heating and cooling. New electric heat pump water heaters (HPWHs) provide significant energy savings and carbon emission reductions compared to conventional electric or natural resistance storage water heaters, or tankless systems. As discussed during EPA’s recent webinar, “demand flexible” electric HPWHs offer the promise of even greater customer utility bill savings and the ability to help better integrate renewable energy to the grid.

Grid flexible water heaters can be controlled to prioritize heating at times when power is abundant, low-price and low-carbon, and avoid heating at times when power is in high demand, higher-price and higher-carbon. In other words, they can pre-heat water and store thermal energy until it is needed. This thermal storage, akin to a built-in battery, is a form of grid flexibility. (For further discussion see [NRDC paper](#) from ACEEE 2018 Summer Study.)

Given the need to ensure a good consumer experience and to get the control systems and software right, we commend ENERGY STAR for its willingness to update its specification to include “connected” criteria specifically designed for water heating to its specification.

- 1. NRDC strongly supports EPA’s proposal to add grid flexibility and communication requirements to its ENERGY STAR residential water heater specification** – NRDC has been an active participant in this specification development process and are supportive of the Draft 1 proposal and the related test procedure development process. We also support the approach EPA took which includes: a) providing language that spells out how to qualify for connected recognition, but not making grid connectivity a requirement for all ENERGY STAR water heaters, and b) avoiding any trade-offs with the efficiency requirements.

This Connected recognition will be very useful for utility incentive programs and potentially future building code requirements.

- 2. NRDC recommends the following modifications to the definitions -**
Add to the current definition the text shown in red - Demand Response (DR): Changes in electric or gas usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity or gas over time, or to incentive payments designed to induce lower electricity or gas use at times of high wholesale market prices or when system reliability is jeopardized, **or to shift load to help integrate renewable energy and reduce system costs.**

- 3. NRDC recommends further clarification of the definitions and to add examples, where possible, to the Demand Response (DR) Information and Messaging sections -**

- Operational state definitions: recommend clarifying these definitions, e.g. provide examples.
- Current Available Energy Storage Capacity: same thing.

- 4. Consider aligning ENERGY STAR’s requirements for Demand Response (DR) Requests and Responses with those in California’s Building Energy Code (Title 24) -**

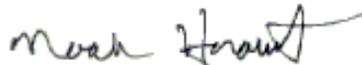
We encourage ENERGY STAR to align with the shed modes and terminology contained in California’s JA13 terminology. ENERGY STAR’s definitions are not entirely aligned with JA13. In particular, the “Emergency/critical curtailment” could lead to higher electric resistance use when the water heater recovers from this shed event, which would be suboptimal. Instead, JA13’s “deep shed” disallows the use of the electric resistance element but still allows compressor use,

which allows some recharge as needed, and reduces the need for electric resistance use during recovery.

5. **ENERGY STAR is strongly encouraged to increase the energy efficiency requirements in its specification to match NEEA's Advanced Water Heating Spec in the next major revision** - While we understand that a "dot revision" isn't the time to make significant changes in efficiency requirements, it is essential that ENERGY STAR differentiates the better performing HPWH in the market going forward. Current efficiency requirements are aligned with federal standards minimum efficiency requirements which are around UEF 2.0. Most of the market is now at UEF 3.0 or higher. Higher ENERGY STAR UEF requirements would enable consumers and utility program managers to choose the more efficient products on the market and drive manufacturer investment in better performance. While even the low-performing HPWH are already much more efficient than electric resistance water heaters, large additional energy, emissions and customer bill savings are possible and already available in the market. Capturing this opportunity falls squarely in ENERGY STAR's mission. We encourage ENERGY STAR to add provisional language at the end of this specification update document signaling its intent to raise the efficiency requirements in its Version 4.0 update.

Thank you for the opportunity to submit these comments and please do not hesitate to contact me or my colleague Pierre Delforge to discuss any questions you might have at 415-875-6100.

Sincerely,



Noah Horowitz
Director, Center for Energy Efficiency Standards
Natural Resources Defense Council
nhorowitz@nrdc.org

