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NRDC Comments on ENERGY STAR Water Heaters Specification – Version 4.0 Final Draft

On behalf of the Natural Resources Defense Council (NRDC), a leading environmental advocacy group with over 3 million members and online activists, we respectfully submit these comments on ENERGY STAR's Final Draft, Version 4.0 specification for residential water heaters.

In summary, we strongly support ENERGY STAR's proposal for electric heat pump water heaters, including efficiency levels and connected criteria, with two important change requests regarding first hour rating and CTA-2045. However, we are very concerned about the continued eligibility of very low efficiency gas water heaters and urge ENERGY STAR to pause the gas portion of the specification as soon as possible.

Background - The final draft proposes to increase the efficiency levels for most electric water heaters by 65 percent, effectively requiring efficient heat pump technology, which NRDC strongly supports, while leaving the specification for gas water heaters, which represent roughly half of the market, unchanged and at levels that barely exceed the current minimum federal energy efficiency standards.

The problem - The efficiency requirements proposed for gas water heaters in the ENERGY STAR proposal are **5 times lower for most gas water heaters**, that is 0.64 to 0.68 Uniform Energy Factor (UEF), compared to 3.3 UEF for electric models. This is barely more efficient than federal minimum energy efficiency standards (0.58 to 0.62 for the most common size of gas-fired models).

- **The specification for gas models undermines the Biden Administration's goals on climate change.** Energy efficiency and a rapid reduction in greenhouse gas emissions are critical to help achieve President Biden's goal of cutting the carbon footprint of the U.S. building stock in half by 2035. Water heating is responsible for almost one fifth of all U.S. homes' energy use, more than all air-conditioners and refrigerators combined. Promoting water heaters that waste more than one third of the energy they use when there are alternatives that are five times more efficient is slowing down market

adoption of more efficient technologies that are critical for achieving emissions reduction goals.

- **Continued inclusion of low-efficiency products in the specification would undermine the ENERGY STAR brand.** Consumers rely on ENERGY STAR to save money and protect the environment. The low-efficiency water heaters included in the draft do neither: they only provide marginal energy, emissions, and utility cost savings of the order of 10 percent compared to standard products, when there are alternatives such as heat pump technologies that are 500 percent more efficient.
- **The current gas water heater efficiency requirements hinder investment and innovation**: By setting requirements at levels that are so much lower than heat pump technologies can achieve, ENERGY STAR effectively hinders market adoption of the better technologies. The super-efficient, climate-friendly water heating technology exists but has low market share in part because it is undercut in the market by much lower efficiency technology that gets miscommunicated as energy efficient. With focused promotion and appropriate incentives, heat pump technologies would see broader adoption and cost reductions, giving industry a clear direction for technology innovation and manufacturing capacity investments.

ENERGY STAR should pause the portion of the ENERGY STAR specification for gas water heaters as soon as possible, to help the market transition to products that are aligned with the Biden Administration's climate commitments**.** Until there is commercially available and cost-effective gas water heating technology that can provide equivalent greenhouse gas reduction benefits as electric heat pump technology, ENERGY STAR should pause the program for gas water heaters and focus on promoting electric heat pump water heaters.

Electric Heat Pump Water Heater Requirements - NRDC urges ENERGY STAR to consider the following two amendments to an otherwise excellent specification for electric heat pump water heaters.

A) ENERGY STAR should reduce first-hour rating (FHR) requirements and align them with Uniform Plumbing Code requirements.

ENERGY STAR FHR requirements of 45 gallons exceed those of the Uniform Plumbing Code (UPC) of 39 gallons for the smallest units. 40-gallon units, especially the 120-volt ones that lack electric resistance elements, cannot achieve the 45-gal FHR requirements. However, these 120-volt 40-gallon units have an important role to play for studios and 1-bedroom apartments that lack the space to upgrade from a 40-gallon electric resistance or gas storage unit to a heat pump unit. These space-constrained applications are an important part of the market and

should not be excluded from the ENERGY STAR program given their superior energy efficiency. We appreciate and support the concern about ensuring that HPWH are sized correctly for the application but setting a high FHR threshold across the board isn't the best way to address this issue.

B) CTA-2045 should be required, not one of two options, to align with other HPWH specifications and standards and establish CTA-2045 as a clear connectivity standard across the country.

The proposed connected criteria in 4.0 and associated test method are essential steps to harnessing the potential for HPWH to help integrate renewable energy on the grid, reduce customer costs and grid operations costs. We strongly support ENERGY STAR's proposed criteria and test method, with one modification request:

The proposal gives the option of either CTA-2045 or OpenADR. These two options are not equivalent: CTA-2045 is a physical port and software interface standard that would guarantee open access at the water heater, ensuring the water heater can be used for demand flexibility during its full operating life. In contract, OpenADR is designed for whole building demand management, and by itself is not well suited to heat pump water heater demand management. It is had no requirement for on-premise connectivity, with most implementations relying on Wi-Fi which is not persistent and would not deliver the expected demand flexibility benefits over the life of these HPWH.

The state of Washington requires CTA-2045 by law for all electric water heaters starting over time between 2021 and 2022. Oregon is proposing to follow suit, and California adopted a specification for compliance credit in its building code (Title 24 Joint Appendix 13) which also requires CTA-2045 via reference to Northwest Energy Efficiency Alliance Advanced Water Heater Specification version 7 Tier 3.

These specifications and standards establish CTA-2045 as a clear standard for the West Coast market, but not yet for the national market. It is important for ENERGY STAR to help establish CTA-2045 as a de facto nationwide standard and avoid the risk of competing standards which would slow down the adoption of connectivity in the HPWH space.

CTA-2045 is an important connectivity standard, which guarantees open access to HPHW at the customer premise for demand flexibility purposes. This avoids persistence issues with Wi-Fi and proprietary access protocols and facilitates the upgrade of the HPWH connectivity solution as new, more affordable and reliable connectivity technologies emerge. For example, low-cost cellular, LoRa, or other new technologies may offer better connectivity than current Wi-Fi well within the lifetime of a HPWH installed today, and a CTA-2045 port would allow existing units to be easily upgraded to these new technologies.

CTA-2045 does not preclude OpenADR, it enables it where it makes sense, building on CTA-2045 as a foundation.

We appreciate the opportunity to comment.

Sincerely,

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