December 9, 2020

Via Email: WaterHeaters@energystar.gov

Ms. Abigail Daken
EPA Manager, ENERGY STAR® HVAC Program
U.S. Environmental Protection Agency

**RE: ENERGY STAR Water Heater Product Specification Version 4.0, Draft 1 and Test Method to Validate Demand Response, Draft 2**

Dear Ms. Daken:

Rheem Manufacturing Company (Rheem) appreciates the opportunity to submit the following comments regarding the ENERGY STAR Product Specification for Residential Water Heaters Version 4.0, Draft 1 and Test Method to Validate Demand Response Draft 2.

Rheem is an industry leader in total heating, cooling, refrigeration and water heating solutions and one of the few global brands with product offerings covering residential and commercial heating, cooling, conventional and hybrid storage water heaters (HPWH), tankless water heaters, solar water heating systems, pool and spa heaters, commercial boilers, residential hydronic and geothermal systems, commercial refrigeration products, indoor air quality accessories, and replacement parts for all categories. Rheem is headquartered in Atlanta, Georgia, and has U.S. based manufacturing facilities in Alabama, Arkansas, California, Connecticut, and North Carolina. The company also operates distribution facilities throughout the US, Canada and many other countries around the world.

**Product Performance Requirements for Electric Water Heaters:**
Rheem supports the more stringent UEF criteria proposed for the electric water heater category. However, there is an emerging segment for 120-volt /15-amp applications, described by NEEA Advanced Water Heater Specification Appendix – A ("Appendix - A") that we would like to see added as a separate subcategory. These include new HPWH models that are designed to address electrical and installation space constraints and can be utilized to replace gas-fired water heaters in some situations. Given these unique characteristics, we recommend a differentiated UEF and FHR criteria as compared to the exiting heat pumps. Specifically, for the ≤ 55-gallon size, we recommend UEF values to be no greater than 3.0 UEF, and the first-hour rating to be

restated as “low or medium usage bin”, rather than a numeric gallon per hour value. We suggest the subcategory be simply defined as “120 Volt / 15 Amp”, without requiring compliance to Appendix- A. This approach will capture a boarder segment of products, including those that are not complying with all provisions of Appendix-A, but provide energy efficient solutions for 120-volt applications. One example is a product configuration that is intended for a 120-volt /15-amp dedicated circuit, rather than a shared circuit specified in Appendix- A.

We also recommend adding reference UL60335-2-40 standard to table 1, for electric water heaters. This standard will supersede UL1995 in 2024 and should be recognized as an acceptable alternate. Rheem is working to have products certified to this standard prior to 2024.

**Product Performance Requirements for Gas-Fired Water Heaters:**
Rheem supports EPA’s decision to maintain the UEF criteria and revision for the minimum FHR to coincide with the medium-usage bin for gas-fired storage water heaters. In fact, in referencing the usage bin as a requirement, the first hour criteria is no longer necessary. Rheem also supports EPA’s decision to revise the maximum GPM to align with the medium draw pattern for gas-fired instantaneous water heaters.

**Product Performance Requirements for Solar Water Heaters:**
Rheem supports in principle the SUEF metric and new test method proposed to update the solar water heater criteria. We appreciate the analysis provided to help reset and translate SEF to SUEF criteria. Rheem has not performed modeling or independent analysis to validate the proposed levels. Our initial observation indicates that further clarification is required to describe how the FHR and usage bin is established. We plan to work with ICC -SRCC to complete analysis of Rheem products and to verify SUEF levels, installed performance and ratings. Recognizing the standard (Appendix- A to the ICC900 / SRCC 300 Solar Thermal Standard) is not final and subject to public comments, we would encourage EPA to closely coordinate effective date, allowing enough time to rerate currently certified products.

**Future Specification Revisions:**
Rheem appreciates EPA efforts to monitor savings potential and consumer payback for different product categories and recognizes that little to no savings has been identified for Gas Storage and Instantaneous Water Heaters that would justify raising the current levels at this time. However, these products provide significant energy savings as compared to the Federal minimum efficiency standard gas- fired models, which still dominate a large portion of the market. We believe the Energy Star program continues to provide value in promoting the energy savings associated with this category. Rheem does not agree with the rationale stated in Section 7C – Future

Specification Revisions, where EPA is considering sunsetting these categories of products. Rheem believes the Energy Star specification should include different categories of water heaters suitable for various applications, installation conditions and fuel types. This will provide choice and practical options for consumers to select most energy efficient products that meet their needs.

**Mixing valve tee connection**:
Rheem agrees with the proposed language for the mixing valve to be installed according to the water heater and mixing valve manufacturer's instructions and to Figure 1 or Figure 2. Also, if there are no installation instructions provided, the mixing valve should be installed on the outlet line, as shown in Figure 1 or Figure 2, and that cold water would be supplied from the inlet line, with connection just downstream of the location where T-in is measured. This will provide a single water source, with evenly regulated temperature and pressure to both the tank and mixing valve.

**Flow Meter and Measurement**:
Rheem recommends updates to Figures 1 and 2 to more clearly depict permissible location of flow meter at the outlet and alternatively to allow direct measurement of mass or volume flow at the inlet side. Where a volumetric flow meter is used on the inlet, Rheem recommends that DOE and EPA follow the AHRI Operations Manual for Residential Water Heater Certification Program, which provides a calculation method to determine mass withdrawn from each draw using density and volume measurements.

**DR Communications Protocols and Standards:**
Rheem encourages EPA to retain the requirement of either CTA-2045-A or Open ADR 2.0b compliance per the previous draft. Including alternates and updated versions such as the CTA-2045-B should be carefully considered, given the regulatory requirements and market adoption of CTA-2045-A in the States of Washington and Oregon. Rheem encourages DOE to maintain the reference to CTA 2045-A at this time and adding reference to CTA 2045-B only after it has been evaluated and published. Further, Rheem appreciates EPA and DOE's participation and contribution in the development of AHRI 1430 Standard for Demand Response for Electric Water Heaters. Rheem encourages EPA to consider transitioning to the AHRI 1430 Standard once it is completed and published.

**Test Method Validation**:
Rheem values the water heater testing DOE performed so far to develop and identify test method improvements. As the test method is further refined and finalized, Rheem recommends additional validation tests be performed, including representative 50-gal and 80-gal water heaters with mixing valves. Rheem is available to provide

additional feedback concerning Section 6: Demand Response and support further testing activities.

We look forward to the continued refinement of Version 4.0 draft 1 and the corresponding Test Method to Validate Demand Response. We appreciate EPA's willingness to consider our comments. If there are questions, please contact me directly.

Sincerely,
RHEEM MANUFACTURING COMPANY

Joe Boros
Sr. Manager Global Regulatory Affairs

cc: Karen Meyers, Vice President, Government Affairs