



June 24, 2011

Ms. Abigail Daken
ENERGY STAR® Water Heater Program Manager
U.S. Environmental Protection Agency (EPA)
1200 Pennsylvania Avenue NW
MC 6202J
Washington, DC 20460

Dear Ms. Daken,

On behalf of Rheem Water Heating we support the U.S. EPA efforts in the development of a second generation (Version 2.0) ENERGY STAR® Water Heater Specification for residential water heaters. As you know, Rheem as a major manufacturer of residential water heating systems sold in the U.S. have a key stake and influence in the market and recognize the importance of this program in helping our country make better use of energy resources and serve to protect the environment through the use of energy efficient products.

As the foundation of our commentary herein and as a general opening statement, the advent of new technologies to increase energy efficiency of water heating equipment has caused the industry in recent years to re-evaluate residential product classifications and associated test procedures which rate, certify and validate water heating equipment sold into the U.S. Rheem recognizes and supports the evolution of new residential energy efficient technology through our recently released new products (high efficiency conventional gas storage, heat pump electric water heater and condensing tankless models) and our ongoing participation in the development of an industry consensus agreement to require the U.S. D.O.E. to conduct a rulemaking to revise its residential water heater test procedure. This test procedure revision is inclusive of establishing a new, single, uniform energy efficiency descriptor for all water heaters replacing the traditional descriptors of Energy Factor and Thermal Efficiency. The new descriptor would cover all residential water heaters: storage, tankless, non-condensing, condensing and would be a major positive step towards technology neutrality and universal product performance labeling which ultimately allows the Customer to make confident and relative energy efficient product decisions amongst the various water heating technologies. This drives Customer driven market choice which we firmly believe is the most efficient method to achieve embraced and sustained market transformation towards higher efficiency product choices.

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However, while we would support a D.O.E. rulemaking process to revise its residential water heater test procedure to accommodate a new energy efficiency descriptor, we also recognize that the stakeholder process to accomplish this is lengthy and would not match up with the proposed ENERGY STAR® Version 2.0 timeline (specification December, 2011; effectivity September, 2012).

Further, we applaud the continued work of many companies, advocates, individuals, utilities and government entities in bringing new technologies, new ideas and new methods of improving hot water “system” efficiency. However, with respect to the ENERGY STAR® Version 2.0 proposal draft, we will run into the same time challenges on each of the topics listed below (categorized as shorter and longer term) in that ALL will require some level of industry consensus of a product and/or system classification and a related product and/or system test procedure and related standard(s). Consequently, it’s our belief that the stakeholder process to implement these proposal items (in total) would be lengthy and not match up with the proposed ENERGY STAR® Version 2.0 timeline as well.

Therefore, in order to maximize the probability to achieve the EPA’s desired objective within the ENERGY STAR® Revision 2.0 targeted timeline, Rheem proposes to focus industry resources on the shorter term item below, specifically the EPA POU Electric proposal inclusive of storage and instantaneous product types. Rheem proposes the “longer term” items listed below be delayed and considered during a subsequent revision of the Residential Water Heater ENERGY STAR® program, not Revision 2.0.

- Shorter term
 - Point of Use (POU) Electric – Rheem proposes to keep the current D.O.E. product classification for POU Electric, establish a revised POU test procedure derived by industry consensus to recognize this category as a true point of use application and develop associated product standards to recognize same.
- Longer term:
 - Inclusion of aftermarket products (water recovery and energy reclamation, etc.) in ENERGY STAR® Revision 2.0: Rheem believes a separate ENERGY STAR® program and timeline needs to be established in that this is a hot water “systems” approach and again requires product classifications and perhaps newly created “systems” classifications, accompanying test procedures and standards derived through industry consensus.
 - Inclusion of Commercial water heater products in ENERGY STAR® Version 2.0: Rheem believes a separate ENERGY STAR® program and timeline needs to be established in that Residential and Commercial products have their own unique set of market application and Customer drivers along with unique safety considerations.

- Revision to existing product category, specifically Solar equivalency on energy efficiency performance (SEF or SF vs. EF): The primary energy generated to heat the water in a solar water heating system is derived from solar means. Accompanying gas and electric fueled water heaters merely provide backup to the solar primary energy source. Accordingly, Rheem supports the position that a separate ENERGY STAR® program and timeline needs to be established for this product category as an alternative fuel category.
In the interim, Rheem continues to support the current ENERGY STAR® criteria for Solar water heaters as it is an efficient means of heating water. At this time Rheem is unaware of any suitable alternatives to the OG-100 test and/or OG-300 rating method.
- Establishment of a new product category, specifically add on Heat Pump Water Heaters: With respect to the U.S. replacement market, Rheem's position is that we believe current integrated heat pump water heaters available on the market today by multiple manufacturers are being designed within a small enough product envelope and deliver ample hot water utility when properly applied, to address a significant amount of replacement installations. The complications of tank warranty assumption by the add on manufacturer and gaining the approval of an industry derived and accepted add-on test procedure in a field retrofit and potential standards development to validate minimum ENERGY STAR® performance criteria that covers the large range of installed application possibilities would be a significant task and likely untimely with respect to meeting the ENERGY STAR® Version 2.0 proposed implementation timetable.

Finally, Rheem wants to re-emphasize our continued support of the DOE's definition for the Residential Water Heater Product Classes as referenced from the Title 10, Code of Federal Regulation, Chapter 11, Part 430, Subpart B, Appendix E. The use of such product definitions make clear the scope of coverage, the applicable test methods and standards and effectively aligns the program with residential water heaters. These are the current rules of our industry in which we as a major manufacturer continue to govern our business and multi-year new product development investment decisions by.

Therefore, with respect to the proposal to combine both high efficiency gas storage (non-condensing and condensing) categories into one, Rheem holds to the position of maintaining current ENERGY STAR® criteria for each and to keep the two categories distinct.

Specifically, for Residential gas condensing water heaters the criteria currently is:

- A minimum Energy Factor of 0.80
- A minimum First-Hour Rating of 67 gallons-per-hour
- A minimum eight-year warranty on the sealed system
- Compliance with ANSI Z21.10.1/CSA 4.1

For ENERGY STAR® Revision 2.0, Rheem does ask the EPA to consider aligning the warranty period of the high efficiency condensing water heater to match that of the high efficiency non-condensing water heater, specifically change the current eight year to “A minimum six-year limited warranty on the sealed system” which will not impact the reliability of the product but can impact the cost and should enhance Customer ROI when considering this technology for their application.

Therefore, it's in this spirit we offer our response to the ENERGY STAR® Water Heaters Product Specification Framework document dated May, 2011 and specifically to the questions within, Rheem wishes to submit the following commentary.

Technology Neutrality

1. Do consumers set out to buy water heaters specifically with a tank, or are they indifferent?

Response: In very basic form, Customers typically look to replace like for like since the decision is seldom “proactive”.

2. Is it appropriate to assess tankless and storage technologies based on one EF level?

Response: If Rheem understands the question correctly, yes we believe a new, single, energy efficiency descriptor can cover a large range of storage and tankless, non-condensing and condensing residential products.

3. How might we compare system sizes between tank and tankless units?

Response: Tank storage volume, recovery rate and First Hour rating are used for system sizing of storage, while temperature rise at various flow rates and F-max is used for tankless. System sizing comparisons vary between manufacturers today.

4. Should hybrid systems (more than 1 gal storage per 4,000 btu/hr input, but less than 20 gallons total) be considered? Is there a test method for these products?

Response: Yes, however work is needed to define the product category, define the product classification, establish and/or attach appropriate safety standards and a test method is required.

Revision to Existing Product Categories

7. What is the potential for gas condensing storage products to be developed at or below 75,000 Btu/hr input rating?

Response: Potential exists.

8. What is the range of projected installed costs for gas condensing storage units? What are the associated maintenance costs over a product's lifetime?

Response: Please refer to NAECA III Technical Support Document commentary.

9. Do gas condensing storage water heaters reliably draw enough energy out of flue gas to condense, or is there an issue with partial load that affects efficiency under field load conditions?

Response: Yes, when properly designed. Maintaining an EF criteria of 0.80 for condensing storage will help ensure category effectiveness. As with many other appliances, the efficiency will vary to some degree with differing loads and cyclic conditions.

10. How do consumers make a decision to purchase a solar water heater? What do they compare it to for cost and operational savings?

Response: Due to the complexity of the installation (specifically for existing homes) decision is proactive and not based upon existing tank replacement. Consumers must rely on contractor input since a majority of the total cost is not equipment but rather labor/installation. Therefore, the savings are not easily assessed.

11. How does the SEF metric compare to EF metric? Could they be considered equivalent compared? Does the SRCC calculate a First Hour Rating parameter that could be compared to that from the DOE test?

Response: They are not equivalent. More research is necessary in this area.

12. What are the sales channels for solar water heaters?

Response: Solar sales require specialized tools, skills, equipment and therefore sales channel is through Solar Dealers/Contractors to consumers and builders.

13. Are there any alternatives to the OG-100 test and/or OG-300 rating method?

Response: We are not aware of any alternatives.

New Product Category Consideration

14. In what situations are add-on heat pump water heaters actually used? Are there situations in which they compete directly with new units, particularly new integrated heat pump units?

Response: Rheem is not in this business and does not have knowledge of this category.

15. What are the distribution channels for add-on electric heat pumps?

Response: Rheem is not in this business and does not have knowledge of the category

16. Is COP the most appropriate metric for assessing the efficiency of Add-On Heat Pump water heaters? How could COP be used in conjunction with the EF of the tank to determine total system efficiency?

Response: No, use of COP alone or in conjunction with EF would not allow for proper comparison with integrated models.

17. At what performance level would a COP requirement be set so as to assure the consumer of significant energy savings? What are the costs associated with this?

Response: Test and research is required to correlate COP and EF levels. There are several system parameters that can affect overall efficiency such as: controls, plumbing connections and design size of tank being utilized, making even good estimates highly variable.

18. What additional performance requirements should be considered for the add-on heat pump category? How could those requirements be verified?

Response: For a replacement application please see aforementioned commentary under longer term considerations and the add-on heat pump sub-bullet. For new installations as a tank and add-on system, the system should be tested and rated (to the current DOE test procedure) with the designated storage tanks they're to be installed with. Add-on heat pump manufacturers should test and certify EF for each model listed to ensure actual efficiency is being achieved as there are functional differences amongst storage tank manufacturers.

19. What are the appropriate warranty requirements to assure consumers a reliable product?

Response: In both the replacement and new installation, the add on heat pump manufacturer must assume the warranty of the tank being used in the add-on system as the Customer warranty from the tank supplier is voided. Therefore, this question is best answered by the add-on heat pump manufacturer.

20. How would models appropriate for POU be distinguished from whole home models? Maximum input power? Storage capacity as well or instead? Should there be a limit on physical dimensions?

Response: Rheem recommends use of current D.O.E. product classification of less than 12 KW and less than 20 gallon storage capacity. Also should utilize D.O.E. test procedure requirement of 36 inch maximum height.

21. How can the efficiency of POU systems be characterized? Are the current test procedure and existing metrics sufficient?

Response: Rheem recommends EF. However, improvements are needed for the POU category. For example, definition of test method is lacking for less than 20 gallon electric storage tanks. Existing tests assume 64.3 gal /day hot water usage which is inappropriate for POU applications. Fittings for testing and temperature set points for draws are inappropriate for POU applications. Also, first hour requirements need to be revised for POU applications.

22. How would water savings be measured for point-of-use products? How can in-field energy savings best be quantified? Would the savings be compared to other point of use products?

Response: Water Sense methods may be applied in some cases. However, others test methods need to be developed to characterize any savings.

23. Can the efficiency of whole home and POU systems be compared? If so, how?

Response: Not readily. This should be a key objective for the new test method development.

24. What additional performance requirements should be considered for the point-of-use category? How should those factors be verified?

Response: Minimum flow rates and flow rates at specified temperature rise should be considered.

25. In what situations are POU water heaters actually used? Are there situations in which they compete directly with whole home units?

Response: Situations are extremely varied and application specific. In many cases the original cost of equipment is the deciding factor followed by installation cost, then space limitations/requirements.

26. Are there any differences in the distribution channels of point of use units vs. whole home?

Response: There are no significant differences; both are sold through retail and wholesale distribution channels.

In closing, Rheem believes that our commentary above will serve to promote energy efficient water heater ENERGY STAR[®] solutions in a manner supporting the consistency and integrity of the ENERGY STAR[®] brand and to the expectations of the U.S. marketplace.

Rheem remains eager to continue working with the Department in the development of the next generation (Version 2.0) ENERGY STAR® Water Heater Specification for Residential Water Heaters and plans to participate as the process continues. Thank you for the opportunity to provide our commentary and respectfully request that the Department consider our commentary outlined above. Should there be any questions or clarifications needed, please let me know.

Kind regards,



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