



November 26, 2007

Mr. Richard H. Karney, P.E.,
Manager, ENERGY STAR Program
U. S. Department of Energy
1000 Independence Avenue SW
Washington DC 20585

Dear Richard:

Thank you for the opportunity to provide additional comments on the recent document, ENERGY STAR Residential Water Heaters: Second Draft Criteria Analysis and Proposal. This letter comprises the response of the American Council for an Energy-Efficient Economy (ACEEE).

Background.

The American Council for an Energy-Efficient Economy is a nonprofit organization dedicated to advancing energy efficiency as a means of promoting both economic prosperity and environmental protection. ACEEE fulfills its mission by conducting in-depth technical and policy assessments; advising policymakers and program managers; working collaboratively with businesses, public interest groups, and other organizations; publishing books, conference proceedings, and reports; organizing conferences and workshops; and educating consumers and businesses.

ACEEE was involved in the NAECA and EPCAct legislation establishing federal efficiency standards, and has been active in all rulemakings since then. We have also been very active in the ENERGY STAR program, both in the technical aspects of setting performance criteria and in the field support of ENERGY STAR program implementation. In these processes we have developed a strong sense of the technical, economic, market, and institutional issues involved in the ENERGY STAR arena. We bring that broad experience to these comments.

ACEEE staff serve on ASHRAE T.C. 6.6 (water heating), have carried out market evaluations for commercial heat pump water heaters, and for other emerging technologies (including solar-assisted water heating, in our Emerging Technologies series). ACEEE also served on the SEGWHAI team, both as staff and as a member of the Advisory Committee, so we have some current knowledge of the industry and its challenges.

The Big Issue

ACEEE strongly supports the effort to develop an ENERGY STAR program for residential water heaters. We recognize the challenge that this represents in adapting the ENERGY STAR model for emerging technologies, and find that it is critical to adapt the model to help pull these key technologies into the market. The long-term future of efficient water heating is condensing gas appliances, heat pumps, and solar-assisted units. The future for pollution prevention must begin now, with these and similar emerging technologies. For additional detail, we refer you to our letter of July 13, 2007, on the prior round of draft rating levels.

Reliability

ACEEE recommends the need to protect the ENERGY STAR brand by assuring that all covered products will be seen as reliable. To a large extent, the Department proposes to use mandatory warranties (of different lengths) to provide this assurance to consumers. ACEEE does not claim expertise in how customers judge reliability, and suggests that the Department continue to consider alternatives that might achieve results that are at least as good, at lower cost. Thus, we will not further comment on warranty requirements in the draft document.

Specific ACEEE Recommendations

Conventional gas and electric storage water heaters.

1. The savings potential (as estimated by differences in EF) for the best conventional tank-type and resistive electric storage water heaters that are widely available are very low (~5%) relative to the apparent threshold for other ENERGY STAR product classes (which seems to be ~10%). In general, ACEEE believes that ENERGY STAR recognition of such small fractional savings threatens to debase the brand's value, and thus ACEEE generally opposes giving ENERGY STAR recognition to conventional gas and electric storage water heaters. Even at 0.65, the per family annual savings are only about \$2/month, so any lower level would be completely invisible. Our earlier comments provide additional detail, noting particular that the three major manufacturers all indicated that they can support a 0.65 minimum. At 0.65, a program could effectively introduce the value of ENERGY STAR to water heating market channels, particularly plumbers and distributors. At the end of that interval, the label would be withdrawn for these products, whether or not higher efficiency water heaters had achieved enough market share to warrant ENERGY STAR labels. Such a program must be time-limited from the outset, or it will strongly discourage introduction of more advanced products, particularly advanced gas units at near-condensing (0.7) and condensing (0.80) levels.
 - *ACEEE supports the Department's first and second criteria for gas WH.(0.65 EF, first-hour rating of 67 gph.*
 - *ACEEE supports the three year sunset for this part of the program.*
 - *to encourage early development and introduction of the next generation of water heaters.*
 - *ACEEE supports exclusion of electric storage water heaters from this program.*
2. We reiterate from our prior comments that long-term market transformation and energy savings require that the thrust of the water heater effort must be on recognizing and encouraging advanced technologies, such as solar, heat pump water heaters, and condensing gas water heaters. If these emerging technologies are considered too "risky" for ENERGY STAR (*sensu stricto*), then it is imperative to set up a new label for such products, under the ENERGY STAR umbrella. Such a program might be called "Leaders' Choice" or other suitable term to denote products that should be the preferred choices for early adopters. This is at least as important as ongoing efforts to set up a higher-performance "tier" for other ENERGY STAR products (analogous to CEE tiers), and complements that effort nicely.
3. To accommodate the shifts in water heater technology and markets that could flow from a strong ENERGY STAR program, ACEEE strongly encourages early publication of

specifications (e.g, EF levels) for advanced products such as condensing water heaters, heat pump water heaters, and solar water heating systems.

Advanced gas-fired storage water heaters.

We note that the Department has dropped its proposal for a “near-condensing” ENERGY STAR level. However, given the Department’s announced intention to “sunset” the 0.65 EF product category, this is acceptable if the Department commits to setting the performance levels for the next generation products within the next year. As noted below, our disappointment is tempered by the condensing water heater performance tier you have proposed.

Tankless gas water heaters

ACEEE supports the Department’s current proposals for tankless, whole-house, water heaters, with the exception of our comments on warranty requirement (see *Reliability*, above).

Based on the Department’s analysis, ACEEE supports the proposed criteria for ENERGY STAR tankless gas water heaters (EF ≥ 0.82 , ≥ 3.0 gpm @ 77°F temperature rise). The technologies are mature. An ENERGY STAR program at this level would give current manufacturers confidence that the market would be carried to larger sales levels by the ENERGY STAR endorsement, justifying investments in better products and greater manufacturing capability. It might also encourage market entry by other firms. In this, we note that the current EF rating method gives results for instantaneous water heaters that are anomalously high relative to expected field performance. Because higher performance levels are feasible, we recommend that the Department remind all parties that ENERGY STAR criteria are subject to regular revision.

Heat Pump Water Heaters (HPWHs)

ACEEE strongly supports the proposed program for heat pump water heaters (HPWHs), with criteria of EF ≥ 2.0 , and first-hour rating ≥ 50 gallons/hr. Because higher performance levels are feasible, we recommend that the Department remind all parties that ENERGY STAR criteria are subject to regular revision.

As shown by the Department’s analysis, HPWH potential savings, even at modest market penetration rates, dwarf those of other technologies. DOE has invested large sums in research and development funds to support market deployment of reliable units. Utilities and others have carried out noteworthy programs, and vendors are supporting their products. The program should be designed to give manufacturers confidence that the market would be carried to larger sales levels by the ENERGY STAR endorsement, justifying investments in better products and greater manufacturing capability. It might also encourage market entry by other firms.

Solar Water Heater Systems

ACEEE supports this program, and the announced criteria for participation (Solar Fraction ≥ 0.50 , and OG-300 certification from the SRCC).

In addition, because the cost of installing solar water heating is much lower at time of construction than as a retrofit to existing houses, we strongly recommend that the ENERGY

STAR new homes program examine whether it gives as much credit as feasible for solar installations, and even for making houses “solar ready” with rough-in piping for solar water heaters (and rough-in wiring for photovoltaics).

Fuel Switching.

We have heard concern that the presence of an electric resistance option could lead to consumer fuel switching based on first cost. As stated in our earlier comments, there are many reasons to oppose reliance on resistive heating, and we find that fuel-switching is rather unlikely. We have predicted that it would be very uncommon: As a retrofit, the cost of installing a gas line or 220 v connection is a substantial barrier to fuel-switching.

Conclusions

Water heating is often the second largest energy use in the house. Under the right circumstances, the ENERGY STAR program for water heaters could help raise efficiency, reduce homeowner bills, and prevent pollution. Such an approach would have to emphasize the higher efficiency technologies (condensing storage gas, solar, heat pump water heaters) while recognizing current market limitations.

It is also important to publish specifications for eligibility for these emerging technology products as soon as possible, so manufacturers have specific goals for marketable products. The bottom line is that the savings associated with these technologies, even at low levels of market penetration, are much greater than the best that can be hoped for by pushing conventional technologies as far as possible.

Overall, ACEEE is generally pleased with the Second Draft Criteria Analysis and Proposal

Sincerely,



Harvey M. Sachs
Director, Buildings Program