

***Appliance Standards Awareness Project
American Council for an Energy Efficient Economy***

July 8, 2016

Ms. Brenda Edwards
U.S. Department of Energy
Building Technologies Program
Mailstop EE-5B
1000 Independence Ave, SW
Washington, DC 20585-0121

Docket Number: EERE-2014-BT-STD-0042

RIN: 1904-AD34

Dear Ms. Edwards:

This letter comprises the comments of the signatories in response to the Department of Energy's Notice of Proposed Rulemaking on Test Procedures for Commercial Water Heaters, Unfired Storage Tanks, and Hot Water Supply Boilers published May 9, 2016

Summary

The signatories thank DOE for extensively addressing in this NOPR the comments we submitted previously under this docket. We generally support DOE's proposed test procedures for Commercial Water Heaters, Unfired Storage Tanks, and Hot Water Supply Boilers ("commercial water heaters"). The following comments provide limited recommendations for improvements. Our responses to DOE's requests for comments refer to the slide presentation displayed and distributed at the June 6, 2016 public meeting.

DOE's NOPR for commercial water heaters standards could save almost two quads of energy over the review period, but only if the energy efficiency of commercial water heaters in the field actually improves. To ensure that standards translate into improved performance requires that DOE's test procedures for this product class adequately simulate normal operating conditions. We believe that the test procedures described in this NOPR are appropriate and reasonable, and will provide regulators, industry and customers with critical comparative information on product energy efficiency.

Metrics

Effective equipment test procedures must capture performance parameters that can have significant impacts on the performance of a technology. Newer condensing combustion and refrigeration-cycle equipment may offer higher energy efficiencies, and be more sensitive to ambient conditions, than legacy commercial water heating equipment. In this NOPR DOE asks commercial water heater manufacturers to adopt test procedure approaches common to other industries which use these

technologies. The signatories recommend that DOE's final rule for commercial water heater test procedures require the collection and reporting of data on ambient conditions during performance testing, including relative humidity, air temperature and barometric pressure.

However, we recommend that ambient conditions only be required and ambient condition data only be collected when this information is relevant to the energy efficiency performance of a specific equipment class. For example, ambient relative humidity is generally understood to have little impact on the efficiency of fossil fuel-fired, non-condensing water heaters. Ambient humidity is relevant to the performance of fossil fuel-fired condensing and refrigerant cycle based commercial water heaters.

Definitions

We agree with DOE that instantaneous water heaters with storage capability should be tested in a manner similar to storage water heaters. The distinction is important because we have not yet found a substantive reason to test non-storage IWH for standby losses. In response to request for comment #12, we are comfortable with the use of either "storage type" (DOE) or "thermostatic" (AHRI) as descriptors for "storage-type instantaneous water heater."

Setting Tank Thermostats

In response to request for comment on issues #6 & 7, we suspect that the thermal efficiency and standby loss tests are sensitive to the choice of outlet temperature vs. mean tank temperature for all storage and instantaneous storage-type commercial water heaters. We support DOE's proposal to change the requirement for thermostat setting to outlet temperature for fossil fuel-fired storage and storage-type instantaneous commercial water heaters. We also support DOE's tentative decision to maintain the mean tank temperature requirement for the standby loss test for electric storage commercial water heaters.

Unfired Hot Water Storage Tanks

In response to request for comment on issue #5, we support DOE's proposal to adopt a standby loss procedure for unfired storage hot water tanks, provided that a procedure is also established to validate AEDMs for these products, which are often built to order in custom configurations. Performance-based test procedures will provide a better understanding of actual energy consumption for this class of product. We recognize also that there are "cross-walk" issues for existing products that meet the R-12 criterion but may not meet whatever standby loss requirement may be adopted by DOE. We further recommend that DOE adopt procedures to deal with commercial storage water heaters and unfired hot water storage tanks whose insulation is field-applied.

Fuel Input Rate for Gas-Fired and Oil-Fired Equipment

In response to request for comment on issue #21, we recommend that DOE use the measured fuel rate for all enforcement testing, while allowing for adjustment of gas pressure within the manufacturer's allowable fuel input rate range.

Instantaneous Water Heaters and Hot Water Supply Boilers

In response to request for comment on issue #17, we support DOE's determination that outlet temperature is an appropriate reference for the standby test instead of mean tank temperature for condensing commercial water heaters.

Classifications of CHPWHs

In response to request for comment on issue #19, we recommend that DOE divide the air-source commercial heat pump water heater category into separate classes for “self-contained” and “remote” evaporator classes. Self-contained commercial heat pump water heaters have been applied in commercial kitchens (and some commercial laundries), where their cooling byproduct is valued. Remote evaporator commercial heat pump water heaters have been applied in areas where both electricity and fossil fuels are relatively expensive, including Hawaii. Ambient conditions (for the evaporator) can vary significantly for these classes and must be recorded in order for the test procedure to yield useful information.

Definitions of CHPWHs

The definition of *ground water-source commercial heat pump water heater* is potentially confusing because it is inconsistent with nomenclature used in the ground-source heat pump industry. “Ground-source heat pump” is commonly understood to include both “direct geo-exchange” and “ground water-source” commercial heat pump water heaters as defined in the NOPR. Similarly, “direct exchange” ground source heat pumps are a type not covered by the definitions in the NOPR.

We recommend that DOE define three sub-categories of ground source heat pumps that are relevant to this NOPR: “closed-loop” systems, that extract heat from the ground by circulating water- or anti-freeze through closed loops buried in the ground (probably the most prevalent type); “open-loop” systems which pump water either from a well or a surface pond, extract heat from it, and return the chilled water to source (second most prevalent); or “direct expansion” systems which circulate refrigerant through closed loops buried in the ground (rare). Alternatively DOE could adopt the definitions provide in ASHRAE’s “Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems (GSHP)”.

Test Procedures for CHPWHs

In response to request for comment on issue #20, we question whether requiring testing without a specified storage tank would create an inherent disadvantage for self-contained units with integrated tanks (essentially larger versions of common residential HPWH types). Rather than testing without a storage tank, would it be more appropriate for DOE to require that CHPWHs be paired with a standard storage tank with a volume proportional to the steady-state heating output of the CHPWH? This approach would provide consistency across manufacturers of both integrated and non-integrated CHPWH types.

We appreciate the opportunity to provide these comments and look forward to the final rule.

Sincerely,



Chris Granda
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Appliance Standards Assistance Project (ASAP)

A handwritten signature in cursive script, appearing to read "H. Sachs".

Harvey Sachs, Ph.D.

Senior Fellow

American Council for an Energy-Efficient Economy