

Appliance Standards Awareness Project
Consumer Federation of America
National Consumer Law Center, on behalf of its low-income clients

May 26, 2021

Ms. Catherine Rivest
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-5B
1000 Independence Avenue SW
Washington, DC 20585

RE: Docket Number EERE–2019–BT–STD–0036/RIN 1904–AE82: Request for Information for Energy Conservation Standards for Consumer Boilers

Dear Ms. Rivest:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), Consumer Federation of America (CFA), and National Consumer Law Center, on behalf of its low-income clients (NCLC) on the request for information (RFI) for energy conservation standards for consumer boilers. 86 Fed. Reg. 15804 (March 25, 2021). We appreciate the opportunity to provide input to the Department.

We urge DOE to withdraw the January 2021 final interpretive rule for gas products and maintain the current product classes for consumer boilers. In January 2021, DOE finalized an interpretive rule which determined that standards that would limit the market to gas products that use condensing technology would result in the unavailability of a “performance-related feature.”¹ This rule would harm consumers by ensuring that inefficient gas products, including residential boilers, continue to be sold. The rule is being reviewed by DOE in accordance with Executive Order 13990,² and we urge DOE to withdraw it as soon as possible.

In this RFI, DOE seeks information on the potential separation of condensing and non-condensing products based on “the complexity/cost of installation, changes to a home’s living/storage space, and the potential for fuel switching.”³ We do not believe that any of these reasons constitute a “performance related feature” that warrants a separate product class. Both condensing and non-condensing boiler products use gas as the primary fuel source and provide the same utility to consumers.

Cost cannot be identified as a feature because nearly every potential increased standard has an impact on cost. DOE routinely takes into account installation costs at each efficiency level in the economic analysis and often evaluates max-tech levels which are very costly. Furthermore, for boilers, there are consumers who will incur additional installation costs even in the base case (i.e., absent any amended standard) due to current safety requirements. For example, in the 2016 final rule for boilers, DOE assumed that chimney relining would be necessary in 6% of installations in 2021 when installing a new

¹ 86 Fed. Reg. 4776 (January 15, 2021).

² https://www.energy.gov/sites/prod/files/2021/02/f82/eere_eo13990_memo_1.pdf.

³ 86 Fed. Reg. 15805.

gas-fired hot water boiler just meeting the existing standard at that time (82% AFUE). DOE also assumed that the installations of 2% of gas-fired hot water boilers would require either installing new vent connectors or resizing the vent system in the base case.⁴

In regards to potential changes to a home's living/storage space, as described in more detail below, there are various venting solutions for high-efficiency boilers, such as DuraVent's FasNSeal product,⁵ that allow the use of an existing exhaust vent and would not affect the living or storage space within a home.

Finally, the potential for fuel switching will result from any standard that affects the first cost of a product that competes against another product that uses a different fuel. Some market segments, such as largescale builders of new homes, will be most sensitive to first cost increases since the builder selecting equipment will not benefit from operating cost savings. Ultimately, restricting standard levels that may result in an enhanced level of fuel switching would restrict the improvement of space heating product standards and limit the energy savings potential for these products.

DOE should conduct a full analysis to evaluate potential amended standards for consumer boilers. As shown in the figures below,⁶ there are boilers on the market that are considerably more efficient than models meeting the current DOE standards and the ENERGY STAR v3.0 specification for annual fuel utilization efficiency (AFUE).⁷ The current ENERGY STAR specification for residential gas boilers (90% AFUE) is considerably higher than the current DOE standard (84% AFUE); according to the 2019 ENERGY STAR Unit Shipment Data and Market Penetration Report, the estimated market penetrations for ENERGY STAR gas and oil boilers are 56% and 72%, respectively.⁸ The efficiency levels of available models show that there is significant potential to improve the standards for consumer boilers and provide greater energy savings to consumers. Furthermore, in the 2016 final rule for residential boilers, DOE found that condensing levels for both gas-fired and oil-fired hot water boilers would result in national energy savings five times greater than the savings from the current standards.⁹

⁴ <https://www.regulations.gov/document?D=EERE-2012-BT-STD-0047-0070>. pp. 8C-11, 8C-13.

⁵ <https://duravent.com/fasnseal-80-90/>.

⁶ Models in the DOE Compliance Certification Database (CCD) as of April 5, 2021.

⁷

<https://www.energystar.gov/sites/default/files/specs//private/Boilers%20Program%20Requirements%20Version%203%200.pdf>.

⁸ <https://www.energystar.gov/sites/default/files/asset/document/2019%20USD%20Summary%20Report.pdf>.

⁹ 81 Fed. Reg. 2396. Table V.37.

Figure 1. Annual fuel utilization efficiency for gas-fired hot water boilers

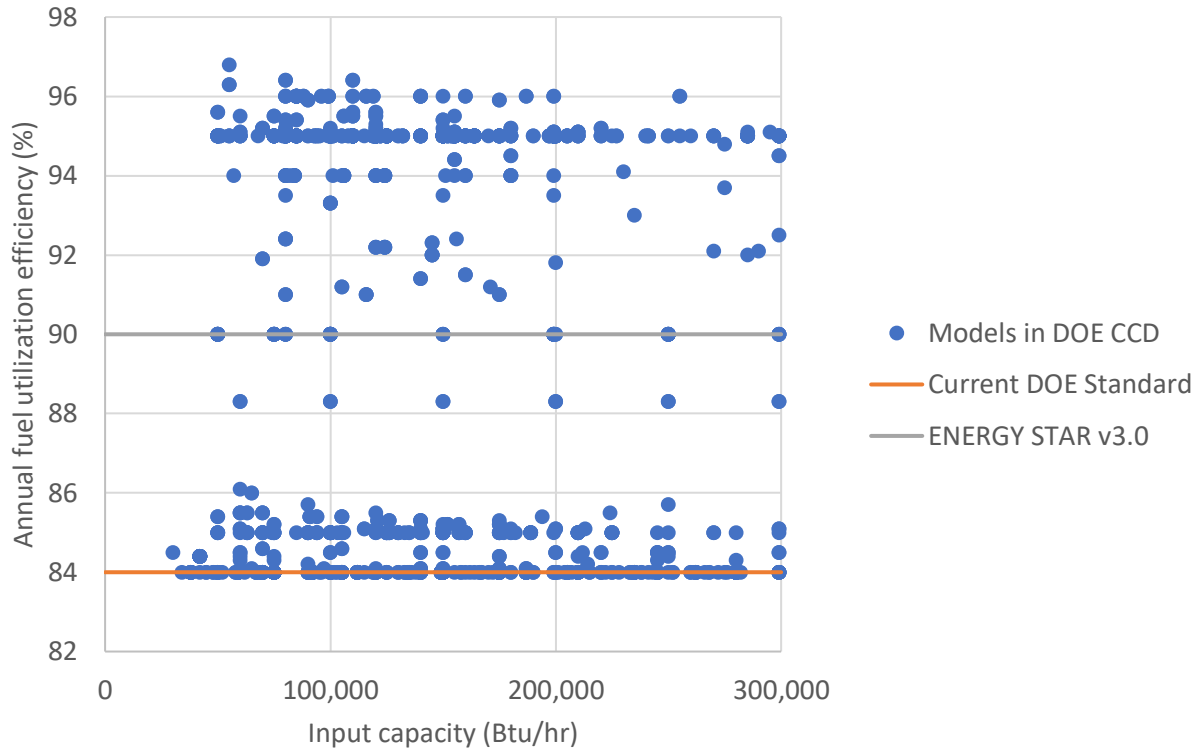
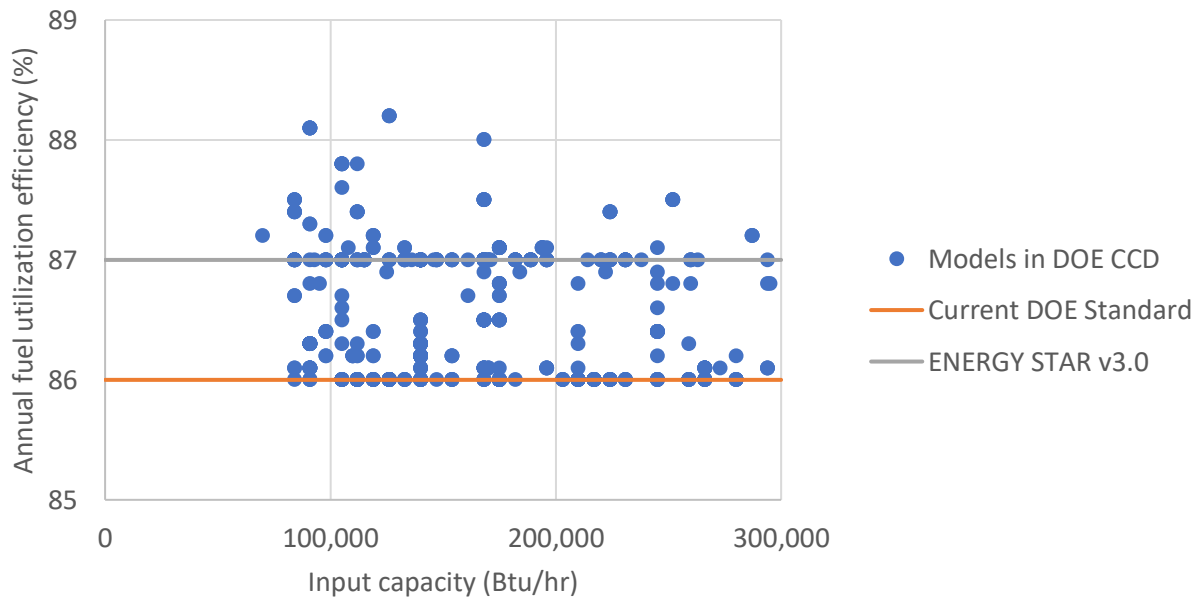


Figure 2. Annual fuel utilization efficiency for oil-fired hot water boilers



We encourage DOE to evaluate gas heat pumps as a potential max-tech efficiency level. Gas absorption heat pumps have the potential to replace standard gas space heating appliances, including in cold climates. Gas heat pumps can provide significant energy savings compared to standard boiler systems, reducing natural gas consumption by up to 30% compared to condensing boilers.¹⁰ In a study that investigated absorption heat pumps for various heating applications, the residential gas heat pump system achieved an AFUE of 141%.¹¹ These systems are commercially available for residential use in the United States¹² and internationally.¹³

Retrofit solutions are available to address installation barriers associated with higher-efficiency boilers. In this RFI, DOE seeks input on issues and costs associated with the venting of flue gases in higher-efficiency boilers.¹⁴ In most cases, condensing boilers are vented through a side wall using plastic (PVC) piping. In cases where sidewall venting is not practical or feasible, the boiler can be vented vertically using PVC piping or can often use the existing Type B vent or chimney. An existing Type B vent can be used to vent a condensing boiler along with an atmospheric water heater with DuraVent's FasNSeal product.¹⁵ The FasNSeal product works for the replacement of a Category I vented appliance with a condensing appliance using a corrosion-resistant stainless-steel liner within the existing Type B vent. A specialized vent cap vents the two products (i.e. the condensing boiler and the atmospheric water heater) individually without taking up additional space.¹⁶ A condensing boiler and an atmospheric water heater can also be vented in an existing chimney using two separate flexible liners: a corrosion-resistant stainless-steel liner for the new condensing boiler, and an aluminum liner for the existing water heater.¹⁷

DOE has also looked into venting solutions that are currently under development; for example, DuraVent has designed a product that utilizes a double-walled flexible vent for concentric venting of multiple products which could be used in an existing masonry chimney.¹⁸ In addition, Oak Ridge National Laboratory (ORNL) has developed a potential low-cost solution for venting Category I and Category IV products in an existing chimney – this product would use jet entrainment to produce negative pressure in a water heater vent to allow for acceptable venting of a power-vented condensing appliance.¹⁹ Although this innovation was developed for condensing furnaces, similar issues persist with condensing boilers and a comparable design could be used to safely vent condensing boiler flue gases. While these products are not currently commercially available, they illustrate the potential for innovation and technology to provide additional venting solutions beyond those already available.

These venting solutions would likely present some additional costs; however, as described above, additional installation costs are often associated with each efficiency level, even in the base case (e.g.,

¹⁰ <http://members.igu.org/html/wgc2009/papers/docs/wgcFinal00323.pdf>.

¹¹ <http://hpc2017.org/wp-content/uploads/2017/05/O.4.3.3-Residential-and-Commercial-Capacity-Absorption-Heat-Pumps.pdf>.

¹² See https://www.roburcorp.com/references/installations/residential_home.

¹³ See https://www.robur.com/heat_pumps/gas_absorption_heat_pump_for_homes_k18 and <https://www.bosch-thermotechnology.com.au/au/en/ocs/residential/compress-3000aw-1064540-p/>.

¹⁴ 86 Fed. Reg. 15808.

¹⁵ <https://duravent.com/fasnseal-80-90/>.

¹⁶ https://duravent.com/wp-content/uploads/2021/04/L301_Catalog_FasNSeal_04-09-2021-web-1.pdf.

¹⁷ <https://web.ornl.gov/sci/buildings/docs/Condensing-Furnace-Venting-Part2-Report.pdf>.

¹⁸ <https://www.regulations.gov/document?D=EERE-2014-BT-STD-0031-0217>. pp. 8L-1, 8L-2.

¹⁹ <https://web.ornl.gov/sci/buildings/docs/Condensing-Furnace-Venting-Part1-Report.pdf>.

when older chimneys require relining). Furthermore, these installation costs are fully accounted for in DOE's economic analysis.

Thank you for considering these comments.

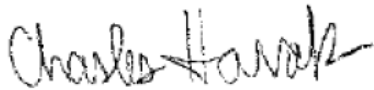
Sincerely,



Kanchan Swaroop
Technical Advocacy Associate
Appliance Standards Awareness Project



Richard Eckman
Energy Research Associate
Consumer Federation of America



Charles Harak, Esq.
National Consumer Law Center
(On behalf of its low-income clients)