

Appliance Standards Awareness Project
New York State Energy Research and Development Authority
American Council for an Energy-Efficient Economy
National Consumer Law Center, on behalf of its low-income clients
Natural Resources Defense Council

February 28, 2022

Ms. Julia Hegarty
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–2021–BT–STD–0031/RIN 1904–AF19: Request for Information for Energy Conservation Standards for Consumer Furnaces

Dear Ms. Hegarty:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), New York State Energy Research and Development Authority (NYSERDA), American Council for an Energy-Efficient Economy (ACEEE), National Consumer Law Center, on behalf of its low-income clients (NCLC), and Natural Resources Defense Council (NRDC) on the request for information (RFI) for energy conservation standards for consumer furnaces. 87 Fed. Reg. 4513 (January 28, 2022). We appreciate the opportunity to provide input to the Department.

DOE should conduct a full analysis to consider amended standards for consumer furnaces. We believe significant energy savings are possible for consumer furnaces, specifically for non-weatherized oil furnaces (NWOFs) and weatherized gas furnaces (WGFs). Additionally, we believe the standards for mobile home oil furnaces (MHOFs) are outdated and should be updated given the efficiencies of current models on the market.

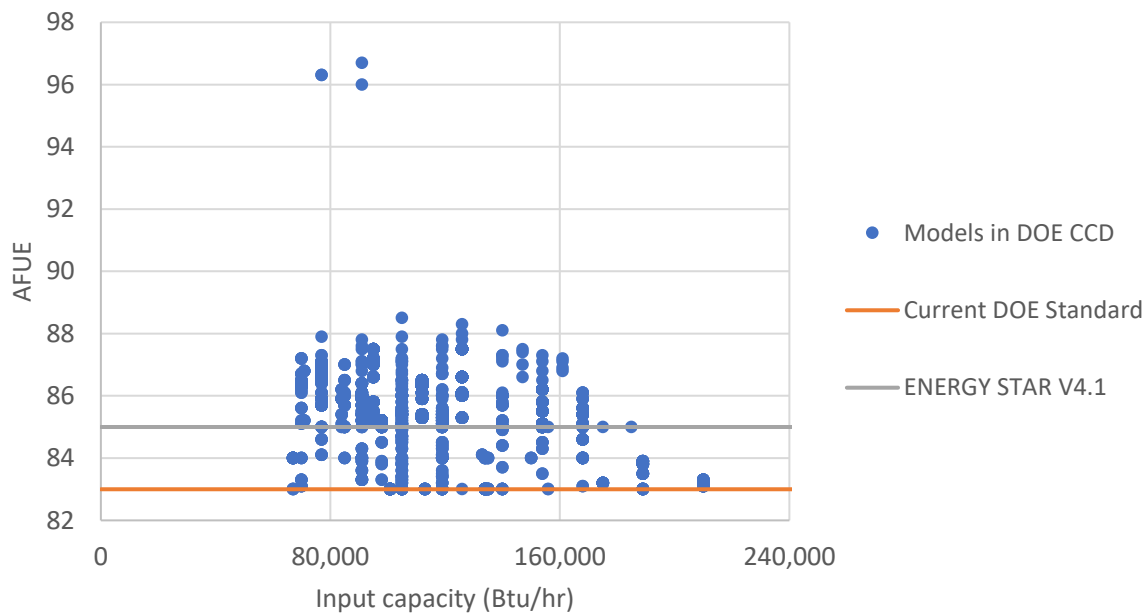
Figure 1 below shows the capacities and annual fuel utilization efficiencies (AFUEs) of currently available NWOFF models.¹ The current DOE standard for NWOFFs is 83% AFUE. In the June 2011 Direct Final Rule (DFR), DOE analyzed three efficiency levels between the baseline and max-tech level (97% AFUE) for NWOFFs. The efficiency level below max-tech was set at 85% AFUE; however, as seen in Figure 1, there are numerous non-condensing NWOFFs above 85% AFUE. Close to 1700 non-condensing and condensing NWOFF models have AFUEs over 85%, which suggests that there is a significant opportunity to improve standards and provide greater energy savings to consumers for this product category alone. A 2019 New York HVAC Market

¹ Models in the DOE Compliance Certification Database (CCD) as of 2-3-22.

Characterization study also supports this conclusion, reporting that in 2017, of the 9,701 oil furnaces sold in New York, 1,408 (15%) were at 86% AFUE or above.²

Furthermore, in the 2011 DFR analysis, DOE estimated that a standard established at the max-tech level for NWOFFs would have resulted in 0.376 additional quads of savings relative to the standard level adopted.³ DOE cited the challenge raised by manufacturers in achieving max-tech, condensing levels for oil furnaces, noting that “some manufacturers indicated that they would not be able to produce products at the condensing level until the sulfur content of heating oil was regulated and substantially lowered in key markets.”⁴ Due to state regulations throughout the northeast, where the majority of heating oil is being used, the sulfur content of heating oil has decreased significantly,^{5,6} thus resolving what was a barrier to adoption of condensing-level standards in 2011.

Figure 1. Efficiencies of NWOFF models in DOE CCD



For WGFs, the current DOE standard is 81% AFUE. DOE did not evaluate condensing technology for this product class in the 2011 DFR due to the lack of condensing models available at the time. Currently, condensing models rated at 95% AFUE are available on the market and represent efficiency improvements of 17% compared to the current DOE standard. Additionally, in the 2007 Final Rule for residential furnaces and boilers, DOE estimated that annual WGF

² 2019 HVAC Market Characterization, NYSERDA <https://www.nyserda.ny.gov/-/media/Files/Publications/building-stock-potential-studies/rbsa-hvac-market-assessment.ashx>.

³ 87 Fed. Reg. 4517.

⁴ 76 Fed. Reg. 37514. June 27, 2011.

⁵ EIA, Sulfur content of heating oil to be reduced in northeastern states, <https://www.eia.gov/todayinenergy/detail.php?id=5890>.

⁶ Northeast Cleans Up Its Heating Oil, <https://www.greenbuildingadvisor.com/article/northeast-cleans-heating-oil>.

shipments would be close to 500,000 in 2030. Therefore, we believe that there are considerable savings possible from amended standards for WGFs.

Finally, while the current DOE standard for MHOFs is 75% AFUE, the efficiency levels of the models listed in the DOE Compliance Certification Database (CCD) range from 80-87%. Thus, we believe the standards for MHOFs are outdated given the efficiencies of current models and should be updated.

We encourage DOE to consider establishing an energy conservation standard for standby and off-mode energy consumption for WGFs and WOFs. In the RFI, DOE states that weatherized furnaces are sold as part of a packaged unit (i.e., with a central air conditioner or heat pump) and that the seasonal energy efficiency ratio (SEER) rating already accounts for standby mode power consumption.⁷ However, the existing SEER rating only accounts for the standby mode power consumption of the cooling operation and does not consider the heating operation.⁸ Thus, we encourage DOE to consider establishing a separate standby mode and off mode energy consumption standard for WGFs and WOFs to account for the consumption during the heating season.

We encourage DOE to analyze technology options outside of those included in the June 2011 DFR analysis. As noted above, in the June 2011 DFR analysis DOE screened out condensing technology as a design option for WGFs and established a max-tech level of 81% AFUE.⁹ In the past, condensate disposal has presented challenges to using condensing technology in weatherized furnaces due to the potential for freezing in cold climates. However, as noted above, condensing technology is available for WGFs, and there are currently 36 models in the DOE CCD that are at condensing levels. This suggests that the challenges with condensate disposal in cold climates can be overcome. Thus, DOE should include a condensing secondary heat exchanger as a technology option for WGFs.

In addition, in the 2016 SNOPR for non-weatherized gas furnaces, DOE considered low-loss linear transformers (LL-LTX) as a technology option for reducing standby mode and off mode electrical power consumption.¹⁰ These transformers offer significant efficiency improvements and use around four times less energy in standby mode compared to standard laminated core linear transformers. Therefore, we encourage DOE to investigate LL-LTX as a technology option for this furnace analysis.

Thank you for considering these comments.

⁷ 87 Fed. Reg. 4517.

⁸ See 10 CFR 430, Subpart B, Appendix M and 10 CFR 430, Subpart B, Appendix N.

⁹ 87 Fed. Reg. 4518.

¹⁰ <https://www.regulations.gov/document/EERE-2014-BT-STD-0031-0217>. p. 3-41.

Sincerely,



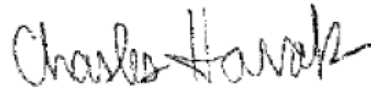
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