

Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
Consumer Federation of America
Natural Resources Defense Council

March 25, 2022

Mr. Bryan Berringer
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–0039/RIN 1904–AE32: Notification of a Webinar and Availability of Preliminary Technical Support Document for Energy Conservation Standards for Dishwashers

Dear Mr. Berringer:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), Consumer Federation of America (CFA), and Natural Resources Defense Council (NRDC) on the preliminary technical support document (PTSD) for energy conservation standards for dishwashers. 87 Fed. Reg. 3450 (January 24, 2022). We appreciate the opportunity to provide input to the Department.

DOE and EPA analysis suggests that higher efficiency dishwashers are able to reduce energy and water consumption while meeting consumer expectations in various performance areas. We support DOE's efforts to understand the relationship between energy and water consumption and consumer satisfaction metrics. In the preliminary analysis, DOE investigated the potential impact of reduced energy and water consumption on dishwasher cleaning performance and cycle time. In addition, as part of the ongoing development of the ENERGY STAR Residential Dishwasher Version 7.0 specification, EPA used web-scraped and *Consumer Reports* data to understand how dishwashers meeting the proposed requirements perform across a range of metrics that impact consumer satisfaction. EPA's proposed criteria for standard-sized dishwashers would establish a maximum annual energy use of 240 kWh/yr and maximum water use of 3.2 gallons/cycle,¹ which are equivalent to the current ENERGY STAR Most Efficient (ESME) criteria and efficiency level (EL) 3 in the DOE preliminary analysis.

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<https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%207.0%20Residential%20Dishwasher%20Draft%20%20Specification.pdf>.

DOE analyzed the cleaning performance at each efficiency level for heavy, medium, and light soil loads and found that products meeting EL 3 were able to reliably maintain adequate cleaning performance.² EPA's analysis found that all dishwasher models rated by *Consumer Reports* that met the Version 7.0 requirements received a cleaning performance rating of Very Good or Excellent.³ Additionally, both DOE and EPA found no clear correlation between cycle time and energy and water consumption.⁴ In fact, the average cycle time of models rated by *Consumer Reports* meeting the Version 7.0 requirements was 142 minutes, while the cycle time of all rated models was 148 minutes. EPA's analysis of *Consumer Reports* data also found minimal differences in drying performance when comparing models meeting the proposed Version 7.0 requirements to all other reviewed models. Web-scraped and *Consumer Reports* data found that noise performance is rated better than average for the higher efficiency models (i.e., the higher efficiency dishwashers were found to be quieter than the average model). The overall *Consumer Reports* owner satisfaction rating was considerably higher for models meeting the Version 7.0 requirements compared to the average of all models (4.36 compared to 3.56 on a scale from 1 for Poor to 5 for Excellent).

These findings from DOE and EPA indicate that dishwashers are able to meet the ENERGY STAR proposed Version 7.0 requirements (i.e., EL 3 for standard-sized dishwashers) while providing high consumer satisfaction across various areas of performance.

We believe DOE may be overestimating the incremental costs to meet intermediate efficiency levels for standard-sized dishwashers. As mentioned above, EPA is proposing to raise the ENERGY STAR criteria for standard-sized dishwashers to the current ESME criteria, which are equivalent to EL 3 in DOE's preliminary analysis. Based on actual prices of available models on the market with similar characteristics (unrelated to energy and water consumption), EPA estimated that the incremental cost of meeting the ESME criteria relative to the current DOE standards is \$48.⁵ However, DOE's preliminary analysis shows an incremental cost of \$110 at EL 3.⁶ Therefore, we encourage DOE to reevaluate the incremental costs for standard-sized dishwashers.

We encourage DOE to evaluate an additional efficiency level for compact dishwashers that would fall between EL 1 and EL 2. In the preliminary analysis, DOE only evaluated two efficiency levels above the baseline level for compact dishwashers: the current ENERGY STAR Version 6.0 requirement and max-tech.⁷ However, based on the distribution of available

² <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 5-17.

³ ENERGY STAR Draft 1 Version 7.0 Residential Dishwasher Data & Analysis Package, https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Draft%201%20Version%207.0%20Residential%20Dishwasher%20Data%20%26%20Analysis%20Package%20-%20Rev.%20May%202020_0.xlsx.

⁴ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 5-17.

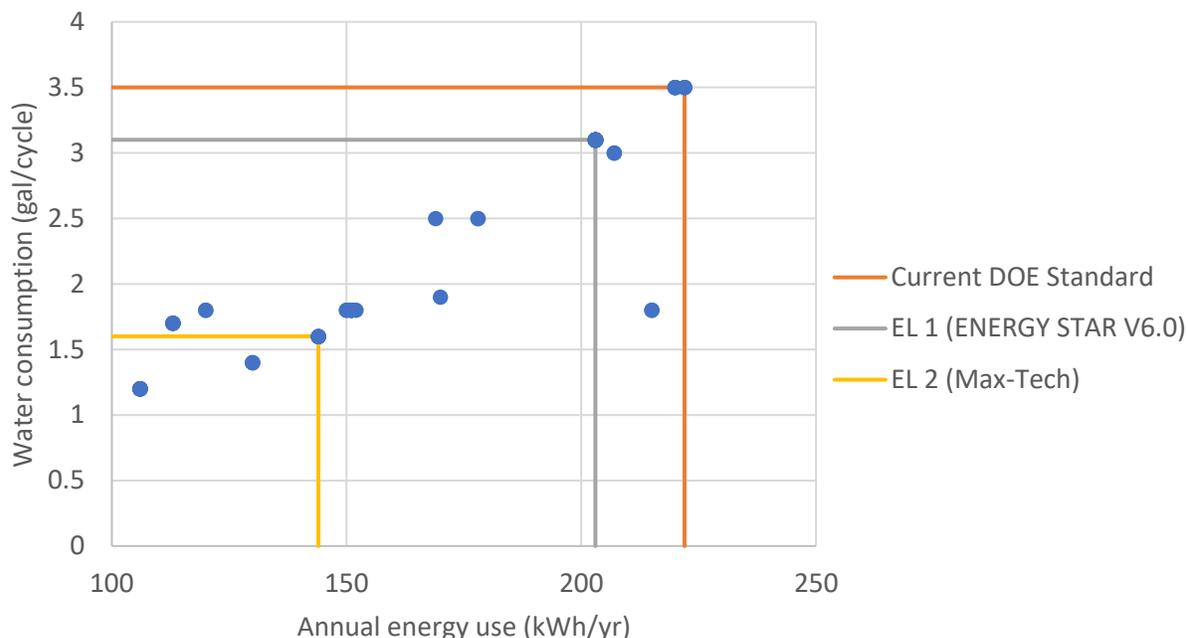
⁵ ENERGY STAR Draft 1 Version 7.0 Residential Dishwasher Data & Analysis Package, https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Draft%201%20Version%207.0%20Residential%20Dishwasher%20Data%20%26%20Analysis%20Package%20-%20Rev.%20May%202020_0.xlsx.

⁶ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 8-35.

⁷ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 5-7.

compact dishwasher models shown in Figure 1, there is a significant gap between the energy and water consumption levels of EL 1 and EL 2. Over half of the models listed in the DOE Compliance Certification Database meet the requirements of EL 1 but fall short of EL 2. Therefore, we encourage DOE to evaluate an intermediate efficiency level for compact dishwashers which could provide an additional option for DOE to consider.

Figure 1. Energy and water consumption of compact dishwasher models⁸



We believe DOE’s assumptions regarding water heater efficiencies are underestimating the energy use associated with water heating. In the preliminary analysis, DOE calculates the energy use associated with hot water heating using water heater efficiencies of 100% and 78% for electric and gas water heaters, respectively.⁹ We believe that these water heater assumptions are overestimating the efficiencies of current water heaters in the field and therefore underestimating the real-world energy savings for dishwashers. As we outlined in our comments on the clothes washers test procedures NOPR,¹⁰ we estimate that the shipment-weighted efficiencies for new water heaters are 92% and 64% for electric and gas water heaters, respectively. Furthermore, average efficiencies of water heaters found in the existing housing stock are likely lower than those of new shipments.

According to DOE’s preliminary analysis, with the current water heater efficiency assumptions, hot water energy use makes up around half of total dishwasher energy use and varies considerably by efficiency level. For example, DOE estimates that a baseline standard-sized dishwasher with an electric water heater uses 151 kWh/yr for water heating, or almost 60% of

⁸ Models listed in the DOE Compliance Certification Database as of March 10, 2022.

⁹ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 7-6.

¹⁰ <https://www.regulations.gov/comment/EERE-2016-BT-TP-0011-0028>.

the total annual energy usage, while a standard-sized dishwasher at EL 4 would use 73 kWh/yr of water heating energy (less than 40% of the total annual energy use).¹¹ We urge DOE to reevaluate the assumed water heater efficiencies to better reflect actual efficiencies in the field in order to more accurately capture the energy savings associated with reduced hot water consumption.

Thank you for considering these comments.

Sincerely,



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¹¹ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. p. 7-6.