

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

April 10, 2024

Dr. Carl Shapiro
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–2024–BT–STD–0002: Request for Information for Energy Conservation Standards for Dishwashers, Residential Clothes Washers, and Consumer Clothes Dryers

Dear Dr. Shapiro:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), Alliance for Water Efficiency (AWE), American Council for an Energy-Efficient Economy (ACEEE), Consumer Federation of America (CFA), Earthjustice, National Consumer Law Center, on behalf of its low-income clients (NCLC), Natural Resources Defense Council (NRDC), and New York State Energy Research and Development Authority (NYSERDA) on the request for information (RFI) for energy conservation standards for dishwashers, residential clothes washers, and consumer clothes dryers. 89 Fed. Reg. 17338 (March 11, 2024). We appreciate the opportunity to provide input to the Department.

DOE published two final rules in 2020 that established separate product classes for dishwashers with a cycle time on the “normal cycle” of 60 minutes or less; top-loading clothes washers and certain clothes dryers¹ with a cycle time of less than 30 minutes; and front-loading clothes washers with a cycle time of less than 45 minutes. These rules were subsequently revoked in 2022. Various States filed a petition in the Fifth Circuit Court of Appeals seeking review of the 2022 final rule, and the Fifth Circuit recently remanded the matter to DOE. The Department is now initiating a rulemaking to consider whether so-called “short-cycle” dishwashers, clothes washers, and clothes dryers should be subject to different standards than other products.

As described in more detail below, separate product classes for “short-cycle” products are unwarranted because there are dishwashers, clothes washers, and clothes dryers on the market today with short cycles that meet existing energy and water conservation standards. Furthermore, current standards are not precluding manufacturers from introducing products with shorter cycle times, and recently finalized standards for clothes washers and clothes dryers and proposed standards for dishwashers would not

¹ Vented, electric standard clothes dryers and vented gas clothes dryers.

require any substantive increase in cycle time. In addition, there is wide availability of products that provide very good performance, and recently finalized and proposed standards would not negatively affect performance. On the other hand, significantly shorter cycle times would likely result in performance tradeoffs. Finally, there is no evidence that the frequency of behaviors such as pre-rinsing, handwashing, or running multiple cycles has increased over time or will increase in the future.

Separate product classes for “short-cycle” products are unwarranted. There are dishwashers, clothes washers, and clothes dryers on the market today with short cycles that meet existing energy and water conservation standards. For example, DOE’s test data on clothes washers and clothes dryers published in August 2020 showed that three top-loading clothes washer models in DOE’s test sample had average cycle times on the “normal” cycle of 29, 27, and 27 minutes, respectively, and one front-loading clothes washer had a cycle time of 45 minutes.² For clothes dryers, there were electric and gas models in DOE’s test sample with cycle times of 36 minutes and 33 minutes, respectively. Furthermore, there is no evidence that a clothes dryer cycle time of 29 minutes, for example, provides a utility that is not provided by products with a cycle time of 33 or 36 minutes.

For dishwashers, the Association of Home Appliance Manufacturers (AHAM) presented data showing that 87% of dishwasher shipments in 2017 provided the option of a short cycle.³ Furthermore, many of these short cycle options are designed for normally soiled loads. For example, an LG dishwasher manual describes a “Turbo” cycle that “will clean heavily soiled dishes in an hour.”⁴ An AHAM survey of 400 models found that only about 50% of short cycles were designed for “light” loads. Furthermore, there is no unique utility with having a short cycle be the “normal cycle,” as selecting a short cycle option simply requires pressing a button on the control panel.

Separate product classes for “short-cycle” dishwashers, clothes washers, and clothes dryers are thus unwarranted because there are products on the market with short cycles that meet existing standards. Furthermore, as outlined below, current standards are not precluding manufacturers from introducing products with shorter cycle times, and new standards will not require any substantive increase in cycle time.

Current standards are not precluding manufacturers from introducing products with shorter cycle times. As noted above, the 2020 final rules established a separate product class for dishwashers with a cycle time on the “normal cycle” of 60 minutes or less, and separate product classes for top-loading and front-loading washers with cycle times of less than 30 minutes and 45 minutes, respectively. However, *Consumer Reports* data presented in a 2018 petition from the Competitive Enterprise Institute (CEI) showed that average dishwasher cycle times were longer than 60 minutes even before any dishwasher standards took effect.⁵ Notably, in the 1980s before the first standards took effect, new dishwashers used more than twice as much energy and water on average than dishwashers sold today.⁶ Similarly, in 1995, when new clothes washers used more than four times as much energy on average than clothes

² <https://www.regulations.gov/document/EERE-2020-BT-STD-0001-0007>.

³ <https://www.regulations.gov/comment/EERE-2018-BT-STD-0005-3188>.

⁴ <https://gscs-b2c.lge.com/downloadFile?fileId=5KeUuVBe6Ok55B0afOWQjw>.

⁵ 83 Fed. 17773 (April 24, 2018).

⁶ AHAM’s “2018 Trends in Energy Efficiency” report shows that in 1981 and 1990, new dishwashers consumed 2.87 and 2.67 kWh/cycle, respectively, on average, compared to 1.14 kWh/cycle in 2018. According to *Consumer Reports*, dishwashers made before 1994 used 10-12 gallons per cycle, while today’s dishwashers use less than half that amount: <https://www.consumerreports.org/appliances/dishwashers/how-to-use-your-dishwasher-a6468169097/>.

washers sold today and could consume unlimited amounts of water,⁷ *Consumers Reports* reported that typical cycle times ranged from 38-50 minutes,⁸ which is similar to the cycle times of many washers on the market today. In fact, as noted above, DOE's August 2020 test data showed that there were clothes washers with cycle times less than 30 minutes. Furthermore, recent test data from DOE show that there is no discernable correlation between efficiency and cycle time.⁹ There is therefore no evidence that current standards are precluding manufacturers from introducing products with shorter cycle times.

Recently finalized standards for clothes washers and clothes dryers and proposed standards for dishwashers would not require any substantive increase in cycle time. For clothes washers, DOE's testing in support of the analysis for the recent direct final rule (DFR) found no discernable relationship between efficiency and cycle time.¹⁰ Furthermore, the ranges of cycle times for models meeting the standard levels adopted for both top-loading and front-loading washers are no higher than for units at lower efficiency levels. Specifically, for top-loaders, units in DOE's test sample meeting the standard level adopted have cycle times that range from around 35 minutes to around 65 minutes, while models at lower efficiency levels have cycle times that range from around 35 minutes to around 70 minutes. For front-loaders, units meeting the standard level adopted have cycle times that range from around 40 minutes to around 55 minutes, while models at lower efficiency levels have cycle times that range from around 35 minutes to around 65 minutes.¹¹

For clothes dryers, DOE's testing found that the amended standards adopted in the recent DFR would not necessitate any increase in cycle time compared to typical cycle times associated with today's minimally compliant dryers. Specifically, DOE found that clothes dryers certified under Appendix D1¹² have an average cycle time of 61 minutes when tested in accordance with Appendix D2, while there were multiple units in DOE's test sample that are certified under Appendix D2¹³ that have a cycle time less than 60 minutes.¹⁴

For dishwashers, DOE's investigative testing found that dishwasher cycle time is not correlated with energy or water consumption,¹⁵ indicating that the proposed standards would not require any substantive increase in cycle time. Furthermore, both the test procedure used today for dishwashers (Appendix C1) and the amended test procedure (Appendix C2) capture energy and water consumption

⁷ AHAM's "2018 Trends in Energy Efficiency" report shows that in 1995, new clothes washers consumed 2.22 kWh/cycle compared to 0.54 kWh/cycle in 2018. (These energy use values include machine and water heating energy consumption. Prior to 2004, the standards for clothes washers did not capture drying energy consumption.) The first water efficiency standard for clothes washers took effect in 2011.

⁸ *Consumer Reports*. 1995. Washing Machines: What's Ahead? What's in Stores Now? February. pp. 96-101.

⁹ For dishwashers, clothes washers, and clothes dryers, respectively: 88 Fed. Reg. 32574 (May 19, 2023); 89 Fed. Reg. 19107 (March 15, 2024); 89 Fed. Reg. 18227 (March 12, 2024).

¹⁰ 89 Fed. Reg. 19107 (March 15, 2024).

¹¹ 89 Fed. Reg. 19106 (March 15, 2024).

¹² Since ENERGY STAR requires that dryers be tested under Appendix D2, most dryers certified under Appendix D1 are minimally compliant with current standards. As of April 1, 2024, 99% of electric standard dryer models in DOE's Compliance Certification Database certified under Appendix D1 have a rated CEF of 3.73 or 3.74 (with 3.73 being the current standard).

¹³ As of April 1, 2024, all but 3 of the 434 electric standard dryer models certified under Appendix D2 in DOE's Compliance Certification Database have a rated CEF of at least 3.93, which is the ENERGY STAR level. (The other three models have a rated CEF of 3.8, which also exceeds the current minimum standard.)

¹⁴ 89 Fed. Reg. 18226 (March 12, 2024).

¹⁵ <https://www.regulations.gov/document/EERE-2019-BT-STD-0039-0015>. pp. 5-17, 5-18.

only on the “normal cycle”; manufacturers would continue to be able to offer short cycle options, which would not be impacted by the proposed standards.

The observed increase in dishwasher cycle time was likely driven by a variety of factors including consumer demand for quiet and efficient machines and detergent changes. While dishwasher cycle times on the “normal cycle” have increased over the past three decades, the *Consumer Reports* data presented in CEI’s 2018 petition showed that the greatest increase in cycle time came during a long period when no new standard was adopted (between 1991 and 2007).¹⁶ Rather, the increase in cycle time can be explained by a range of other factors.

In particular, there appears to be clear consumer demand for both quiet and efficient machines. According to *Reviewed*, older dishwashers had sound levels around 60 decibels (“just below the sound level of a vacuum”), while modern dishwashers average between 40 and 50 decibels (“about as loud as typing on a keyboard”).¹⁷ *Wirecutter* notes that dishwashers that fall around 45 decibels on average “are practically silent (unless you’re standing right next to them).”¹⁸ *Reviewed* explains that “there are lots of ways to reduce noise, but most of them involve reducing the machine’s cleaning power, and that in turn means lengthening the cycle times to compensate.”¹⁹ Furthermore, ENERGY STAR data indicate that consumers are choosing to buy highly efficient dishwashers. Specifically, between 2010 and 2022, the ENERGY STAR market penetration for dishwashers ranged between 84% and 100%.²⁰

In addition, by 2010, many states had banned the sale of dishwasher detergents with phosphates, which resulted in detergent manufacturers introducing new detergent formulas. Newer detergents use enzymes, which, according to *Reviewed*, “take time to work—potentially *a lot* of time, depending on the type of food and the material it’s bonded to.” *Reviewed* notes that “Dishwasher makers know this, so they’ve extended their cycle times to ensure the enzymes have time to do their business.”²¹

In sum, rather than being driven primarily by amended energy and water conservation standards, the observed increase in dishwasher cycle time appears to be a result of a variety of factors including consumer demand for quiet and efficient machines and detergent changes.

There is wide availability of dishwashers, clothes washers, and clothes dryers that provide very good performance, and more efficient models often provide better performance. For dishwashers, 98% of models currently rated by *Consumer Reports* received a washing performance score of 4 or 5 (out of 5).²² *Consumer Reports* notes that the best dishwashers “now can wash dishwashers squeaky-clean and dry them almost completely, all while using minimal water and energy—and they run quietly enough that you forget they’re running at all.”²³ For clothes washers, nearly three-quarters of ENERGY STAR top-loading models tested by *Consumer Reports* (including both agitator and non-agitator models) received a washing performance score of 4 or 5, while only slightly more than one-quarter of non-ENERGY STAR

¹⁶ 83 Fed. 17773 (April 24, 2018).

¹⁷ <https://reviewed.usatoday.com/dishwashers/features/is-your-dishwasher-quiet-enough>.

¹⁸ <https://www.nytimes.com/wirecutter/reviews/the-best-dishwasher/>.

¹⁹ <https://reviewed.usatoday.com/dishwashers/features/why-is-my-dishwasher-so-slow>.

²⁰ https://www.energystar.gov/partner_resources/products_partner_resources/brand-owner/unit-shipment-data/archives.

²¹ <https://reviewed.usatoday.com/dishwashers/features/why-is-my-dishwasher-so-slow>.

²² <https://www.consumerreports.org/appliances/dishwashers/c28687/>. Accessed April 1, 2024.

²³ <https://www.consumerreports.org/appliances/dishwashers/best-dishwashers-of-the-year-a6109623431/>.

models achieved such ratings.²⁴ Front-loading washers, which are generally more efficient than top-loaders, score even better on washing performance; all but one model rated by *Consumer Reports* received a washing performance score of 4 or 5, and nearly 80% received a 5.²⁵ Finally, for clothes dryers, more than 90% of ENERGY STAR electric dryers tested by *Consumer Reports* received a drying performance score of 4 or 5, while only about two-thirds of non-ENERGY STAR models achieved such ratings.²⁶ Similarly, more than 80% of ENERGY STAR gas dryers tested by *Consumer Reports* received a drying performance score of 4 or 5, while less than 60% of non-ENERGY STAR models achieved such ratings.²⁷

Recently finalized standards for clothes washers and clothes dryers and proposed standards for dishwashers would not negatively affect performance. As part of the analysis for the recent rulemaking on clothes washers, DOE conducted extensive testing to evaluate any impacts of more stringent standards on a range of performance characteristics. DOE found that the standards proposed in the March 2023 notice of proposed rulemaking (NOPR) (i.e., efficiency level [EL] 3 for standard-size top-loading and front-loading washers) would not require any substantive reduction in hot water temperature; would allow clothes washers to continue to provide very good cleaning performance; and would not preclude the ability to provide mechanical action (“wear and tear”) scores comparable to the scores for units at lower efficiency levels.²⁸ In the recent DFR, DOE adopted efficiency levels that were one EL lower than those proposed for both top-loaders and front-loaders (i.e., EL 2); these are equivalent to the current ENERGY STAR levels. The recently finalized standards thus can be achieved with key performance attributes (wash temperatures, stain removal, and mechanical action) that are largely comparable to the performance of lower-efficiency units. Furthermore, as noted above, *Consumer Reports* testing shows that ENERGY STAR top-loading washers generally provide better washing performance than non-ENERGY STAR models, suggesting that the new standards will improve washing performance for top-loading machines.²⁹

For clothes dryers, the amended test procedure (Appendix D2) that will be used to determine compliance with the new standards requires that models meet a threshold for “final moisture content” in order to be certified as compliant; this requirement ensures that compliant dryers will adequately dry the clothes. There are more than 400 electric clothes dryer models and nearly 200 gas clothes dryer models that are certified to the current ENERGY STAR specification,³⁰ which is equivalent to the recently adopted standard levels³¹ and is based on Appendix D2; these models all meet the final moisture content threshold. In addition, as noted above, *Consumer Reports* testing shows that ENERGY STAR electric and gas dryers generally provide better drying performance than non-ENERGY STAR models, suggesting that the new standards will improve drying performance.

²⁴ <https://www.consumerreports.org/appliances/washing-machines/top-load-agitator-washer/c32002/>; <https://www.consumerreports.org/appliances/washing-machines/top-load-he-washer/c37107/>. Accessed April 1, 2024.

²⁵ <https://www.consumerreports.org/appliances/washing-machines/front-load-washer/c28739/>. Accessed April 1, 2024.

²⁶ <https://www.consumerreports.org/appliances/clothes-dryers/electric-dryer/c30562/>. Accessed April 1, 2024.

²⁷ <https://www.consumerreports.org/appliances/clothes-dryers/gas-dryer/c30563/>. Accessed April 1, 2024.

²⁸ <https://www.regulations.gov/document/EERE-2017-BT-STD-0014-0059>.

²⁹ For front-loading washers, more than 90% of current sales already meet the standard levels adopted in the DFR. 89 Fed. Reg. 19061 (March 15, 2024). Front-loading washers will thus largely be unaffected by the amended standards.

³⁰ <https://www.energystar.gov/productfinder/product/certified-clothes-dryers/results>. Accessed March 27, 2024.

³¹ For standard-size electric and gas dryers, which make up the majority of the market.

For dishwashers, the amended test procedure (Appendix C2) that will be used to determine compliance with new standards requires that models meet a minimum per-cycle cleaning index threshold of 70 at each of the soil loads for a test cycle to be considered valid; this requirement ensures that compliant dishwashers are adequately cleaning the dishes. DOE's testing found that standard-size dishwashers with efficiencies up to EL 3 in the analysis for the 2023 NOPR could achieve the specified cleaning index threshold,³² while DOE proposed to adopt EL 2. In addition, there are more than 400 dishwasher models that are certified to the current ENERGY STAR specification,³³ which is more stringent than DOE's proposed standards; all ENERGY STAR qualified products must meet a minimum cleaning performance index. These data demonstrate that there is wide availability of dishwashers that both meet DOE's proposed standard levels and provide good cleaning performance.

Significantly shorter cycle times would likely result in performance tradeoffs. There are many product attributes of dishwashers, clothes washers, and clothes dryers that are important to consumers including cleaning/drying performance, noise, efficiency, and cycle time. Manufacturers have to balance all of these attributes, and significantly shorter cycle times would likely result in performance tradeoffs. For example, DOE's dishwasher test data show that short cycles with a cycle time of less than 60 minutes provide worse cleaning performance than the "normal" cycles on the same machines, in particular for "heavy" and "medium" soil loads.³⁴ Specifically, DOE found that the average per-cycle cleaning index for the dishwashers in their test sample with the "heavy" soil load was 63.1 on the "normal" cycle compared to 49.5 on short cycles <1 hour; for the "medium" soil load, the average cleaning index was 67.9 on the "normal" cycle compared to 57.9 on short cycles <1 hour. *Reviewed* reports that "speed cycles" fall short of older dishwashers in "raw cleaning power." They note that while these speed cycles "can be as loud and inefficient as they want, they're still limited to using the new, enzyme-based detergent."³⁵ In addition to sacrificing cleaning performance, shorter dishwasher cycles would likely be noisier since one way of reducing cycle time is to increase mechanical action, which increases noise levels.

For clothes washers, AHAM has noted that in order to reduce cycle time, "many manufacturers may elect to reduce clothes washer spin time."³⁶ As AHAM explained, reducing spin time would mean that clothes would come out of the washer wetter, which would have the effect of increasing dryer cycle time. And for clothes dryers, shorter cycle times than those available today would likely require higher heat levels and/or the use of high heat for longer periods of time, which could damage the clothes being dried.³⁷

There is no evidence that the frequency of behaviors such as pre-rinsing, handwashing, or running multiple cycles has increased over time or will increase in the future. As DOE described in the recent DFR for clothes washers, the average number of clothes washer cycles per year declined from 292 in the 2005 Residential Energy Consumption Survey (RECS) to 210 in the 2020 RECS.³⁸ Similarly, in the recent

³² 88 Fed. Reg. 32532 (May 19, 2023).

³³ <https://www.energystar.gov/productfinder/product/certified-residential-dishwashers/results>. Accessed March 27, 2024.

³⁴ <https://www.regulations.gov/document/EERE-2018-BT-STD-0005-3213>.

³⁵ <https://reviewed.usatoday.com/dishwashers/features/why-is-my-dishwasher-so-slow>.

³⁶ <https://www.regulations.gov/document/EERE-2021-BT-STD-0002-0002>, p. 18.

³⁷ <https://www.sciencedaily.com/releases/1999/08/990831080157.htm>;
<https://reviewed.usatoday.com/laundry/features/how-dryers-destroy-your-clothes>.

³⁸ 89 Fed. Reg. 19066 (March 15, 2024).

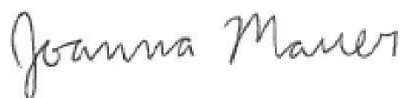
DFR for clothes dryers, DOE noted that the average number of cycles per year for electric standard clothes dryers declined from 301 in the 2005 RECS to 213 in the 2020 RECS, and for vented gas standard clothes dryers from 292 in the 2005 RECS to 213 in the 2020 RECS.³⁹ During the same period, DOE noted that the average household size has remained essentially unchanged. In addition, measured data on clothes washer usage showed that the average number of loads per household per day declined from 0.81 in 1999 to 0.71 in 2023, and average daily per-capita water use for clothes washing declined from 15.0 gallons/day in 1999 to 5.8 gallons/day in 2023.⁴⁰ In other words, there is no evidence that consumers are running multiple cycles on the same load in response to improved efficiency standards.

For dishwashers, data also indicate that the number of cycles per year has declined over time. DOE established an assumed annual number of cycles per year of 215 in 2003 for the purposes of the test procedure based on data from several sources including the 1997 RECS.⁴¹ DOE recently updated the number of cycles per year to 185 based on the 2015 RECS. In addition, according to *Consumer Reports*, with dishwashers sold a decade or two ago, “you had to prerinse dirty plates, bowls, and glasses in the sink before loading them into the dishwasher to ensure your dishes came out clean.” But now, “most dishwashers work *better* if you don’t prerinse them.”⁴²

Furthermore, as described above, recently finalized standards for clothes washers and clothes dryers and proposed standards for dishwashers would not negatively affect performance. Therefore, there is no reason to believe that behaviors such as pre-rinsing, handwashing, or running multiple cycles will increase in the future in response to amended standards.

Thank you for considering these comments.

Sincerely,



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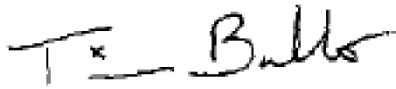
Courtney Griffin
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³⁹ 89 Fed. Reg. 18197 (March 12, 2024).

⁴⁰ <https://www.regulations.gov/comment/EERE-2017-BT-STD-0014-0508>.

⁴¹ 88 Fed. Reg. 3244 (January 18, 2023).

⁴² <https://www.consumerreports.org/appliances/dishwashers/how-to-use-your-dishwasher-a6468169097/>.



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