

Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
National Consumer Law Center
Natural Resources Defense Council

February 15, 2011

Ms. Brenda Edwards
U.S. Department of Energy
Building Technologies Program
Mailstop EE-2J
1000 Independence Avenue, SW
Washington, DC 20585-0121

RE: Docket Number EERE-2010-BT-TP-0039 / RIN 1904-AC27: Test Procedures for Residential Dishwashers, Dehumidifiers, and Conventional Cooking Products (Standby Mode and Off Mode)

Dear Ms. Edwards,

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), National Consumer Law Center (NCLC), and Natural Resources Defense Council (NRDC) in response to the Department of Energy (DOE) request for comments on the notice of proposed rulemaking (NOPR) for test procedures for residential dishwashers, dehumidifiers, and conventional cooking products and the public meeting held to discuss the document on December 17, 2010.

It is important to account for the standby and off mode energy use of products as these modes can account for significant energy use, and so we are pleased that DOE is conducting this rulemaking. We provide the following comments on the proposed rule to ensure that: 1) the definition of cycle finished mode is sufficiently broad to capture all energy-consuming features in this mode; 2) energy consumed during delay start mode is separately measured and accounted for; 3) the definition of standby mode is sufficiently broad to encompass standby energy consumption in network mode; 4) the hours assigned to cycle finished mode accurately reflect consumer usage; 5) non-active hours be partially allocated to off mode only if the off switch is clearly intended for consumer use; and 6) energy consumption in all types of inactive modes is measured and accounted for. We appreciate the opportunity to provide input into this important process.

Definition and Measurement of Cycle Finished Mode

DOE is proposing to define cycle finished mode for dishwashers as “a standby mode which provides continuous status display following operation in active mode,” and for conventional cooking products as “a standby mode in which a conventional cooking top, conventional oven, or conventional range provides continuous status display following operation in active mode.” 75 Fed. Reg. 75324, 75326 (December 2, 2010). We are concerned that this narrow definition of

cycle finished mode will not capture all energy-consuming features in cycle finished mode. For example, at least some models of dishwashers and conventional cooking products on the market contain fans that continue to run after the active cycle is finished. An owner's manual for GE dishwashers indicates that if the "Heated Dry" option is off, top-control models have a fan that will run for up to 4 hours after the "Clean" light illuminates, and if the heater is turned on, the fan will continue to run for up to 2 hours after the "Clean" light illuminates.¹ GE's website notes that on electronic models of ranges, the convection fan may stay on after the cooking is finished or the self-cleaning cycle is complete and that it is normal for the fan to run until the oven is cool, which takes up to 2 hours.² An owner's manual for Whirlpool convection ovens notes that the cooling fan may continue to operate even after an oven function has been canceled.³

If additional energy-consuming features in cycle finished mode other than a continuous status display are not captured in the test procedures, the test results will not depict the representative average energy use in cycle finished mode. For example, the power consumption of fans may be significantly higher than the power consumption of a continuous status display. In addition, manufacturers will have no incentive to reduce the power consumption of additional features in cycle finished mode while still providing the added functionality if the power consumption of these features is not measured. Therefore, we suggest that DOE expand the definition of cycle finished mode for dishwashers and conventional cooking products to include any energy-consuming features following operation in active mode before the product reverts to inactive/off mode.

In addition, we encourage DOE to ensure that the measurement of power consumption in cycle finished mode actually captures all energy-consuming features including fans. The proposed language for the Code of Federal Regulations in the NOPR includes the direction to "measure and record the average cycle finished mode power, P_{CF} , in watts." 75 Fed. Reg. 75325. While this language may be sufficient for the measurement of cycle finished mode if cycle finished mode is limited to a continuous status display, additional specifications may be necessary for a measurement that captures all energy-consuming features in cycle finished mode. For example, it may be necessary to specify that the operation of the product during the power consumption measurement should represent typical operation following operation in active mode.

Treatment of Delay Start Mode

For dishwashers, dehumidifiers, and conventional cooking products, DOE is proposing to allocate delay start mode hours to the inactive and off modes. 75 Fed. Reg. 75306, 75308, 75310, 75313. While we recognize that an active mode test procedure for measuring delay start mode energy consumption cannot be established as part of this standby mode and off mode test procedure rulemaking, we encourage DOE as soon as possible to incorporate measurement of the energy consumption in delay start mode as part of the active mode test procedures as this mode

¹ GE Appliances. Dishwashers.

<http://products.geappliances.com/MarketingObjectRetrieval/Dispatcher?RequestType=PDF&Name=49-55065.pdf>.
Page 8.

² GE Appliances. Range- Fan Noise and Normal Operation.
<http://www.geappliances.com/search/fast/infobase/10000206.htm>.

³ Whirlpool. Built-In Electric Convection Oven.

http://www.whirlpool.com/assets/pdfs/product/ZUSECARE/GBS279PVS_Use%20and%20Care_EN.pdf.

can represent significant power consumption. In the interim, we believe that the allocation of delay start mode hours to the inactive and off modes may be an appropriate temporary solution until the active mode test procedures for these products are amended.

If the energy consumption in delay start mode is not measured as part of the test procedures, the test procedures will effectively ignore significant differences in delay start mode power consumption among products. Testing conducted by DOE found that power consumption in delay start mode ranged from 0.27-4.22 W for dishwashers and from 2.00-10.78 W for ovens.⁴ Manufacturers of products with high power consumption in delay start mode will have no incentive to provide this functionality with lower power consumption if it is not captured in the test procedure. In addition, for some products the measured power levels in delay start mode were significantly higher than the power levels in inactive/off mode. For example, for dishwashers, the power consumption of Unit 3 was 0.03 W in inactive/off mode and 2.06 W in delay start mode while the power consumption of Unit 4 was 1.42 W in inactive/off mode and 4.22 W in delay start mode.⁵ These data demonstrate that for many products, the power consumption in inactive/off mode is not representative of power consumption in delay start mode.

Network Mode

DOE is not proposing to include a measurement of energy use in network mode in the test procedures. 75 Fed. Reg. 75299. We understand the challenges of incorporating network mode when dishwashers, dehumidifiers, and conventional cooking products that include networking functions have not yet appeared on the market. However, “smart” products may soon become common, and therefore it is important that the test procedures capture at a minimum the standby energy consumption associated with network mode. Zpryme’s 2010 Smart Appliance Report projects that in 2015, U.S. sales of smart dishwashers will reach \$0.70 billion, accounting for 12.8 percent of the U.S. household smart appliance market.⁶ GE’s website indicates that they are developing a dishwasher that will automatically set to air-dry during high-cost hours and a double-oven range that will temporarily disable the self-clean feature, automatically reduce cooktop surface power use, and automatically default to the less energy-consuming upper oven during high-cost periods.⁷ Whirlpool has announced that all of its electronically controlled appliances will be Smart Grid compatible by 2015.⁸

We are concerned that DOE is not proposing to capture the energy use of products in network mode since this additional energy use could potentially be significant. If the energy consumption associated with network functionality is not captured to any extent in the test procedure, manufacturers will have no incentive to employ technologies that provide this feature with low power consumption.

⁴ Docket Item: EERE-2010-BT-TP-0039-0005.

⁵ Ibid.

⁶ Zpryme Research and Consulting. 2010. Smart Grid Insights: Smart Appliances. March 2010. http://www.zpryme.com/SmartGridInsights/2010_Smart_Appliance_Report_Zpryme_Smart_Grid_Insights.pdf.

⁷ GE Appliances. <http://www.geappliances.com/home-energy-manager/appliance-energy-consumption.htm>.

⁸ GreenBiz. 2009. Whirlpool Set to Launch Smart Grid Compatible Appliances by 2015. <http://www.greenbiz.com/news/2009/05/08/whirlpool-set-launch-smart-grid-compatible-appliances-2015>.

We recognize the data limitations that DOE identifies in the NOPR that may not allow for developing a test procedure during this rulemaking that captures energy consumption when a product is actually connected to a network. 75 Fed. Reg. 75299. However, it is likely that standby power consumption will represent the majority of the total energy consumption associated with network mode. Therefore, at this time we encourage DOE to ensure that the standby test captures any standby power consumption associated with network functionality that a dishwasher, dehumidifier, or conventional cooking product would consume regardless of whether the product is actually connected to a network. To capture this energy consumption, we suggest that DOE develop a definition for inactive (standby) mode that is sufficiently broad so as to capture any standby power consumption associated with network mode that would be captured in the standby test as long as the network functionality is not disabled during the test.

Cycle Finished Mode Hours for Dishwashers

At the public meeting on December 17 it was noted that DOE's testing observed that "a dishwasher display continues indefinitely if the user doesn't take any action."⁹ In addition, as noted above, at least some dishwashers have fans that continue to run for up to several hours after the end of the active cycle.¹⁰ Based on this information, we believe that DOE's assumption that on average dishwashers spend 1.1 hours per cycle in cycle finished mode (75 Fed. Reg. 75305) is too low. We also note that the 1.1 hour estimate is based on a very limited European data set and is therefore unlikely to be representative of U.S. consumers, and it is unclear how the 1.1 hour estimate was calculated.

While we are not aware of additional data sources regarding time spent in cycle finished mode, we encourage DOE to do additional testing to more accurately estimate the average time spent in cycle finished mode. Specifically, we suggest that DOE measure the duration of cycle finished mode in the absence of user interaction; make logical assumptions about the percentage of consumers that allow the dishwasher to run through the end of cycle finished mode; and compare these calculations to the 1.1 hour average assumed. The estimate of cycle finished hours is important because the DOE test data show that power consumption in cycle finished mode can be as high as 4 W and that power consumption in cycle finished mode can be significantly higher than power consumption in inactive/off mode for individual products.¹¹

Cycle Finished Mode Hours for Ovens and Ranges

In the NOPR, DOE assumes that ovens and ranges on average remain in cycle finished mode for 5 minutes after every cycle. 75 Fed. Reg. 75309, 75312. However, there is no information presented that indicates how DOE developed this estimate. As noted above, manufacturers state that it is normal on at least some ovens and ranges for fans to continue to run for up to 2 hours

⁹ DOE Public Meeting Transcript. Energy Conservation Standard NOPR for Test Procedure for Dishwashers, Dehumidifiers and Conventional Cooking Products. December 17, 2010. pp. 42-43.
http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/dw_dehum_ccp_tp_nopr_meeting_transcript.pdf.

¹⁰ GE Appliances. Dishwashers.
<http://products.geappliances.com/MarketingObjectRetrieval/Dispatcher?RequestType=PDF&Name=49-55065.pdf>.
Page 8.

¹¹ Docket Item: EERE-2010-BT-TP-0039-0005.

after the end of the active cycle.¹² This seems to suggest that cycle finished mode likely continues on average for much longer than 5 minutes. If no data is available on the average amount of time that ovens and ranges spend in cycle finished mode, we encourage DOE to use limited observations of ovens and ranges and/or product information supplied by manufacturers to develop an estimate of cycle finished mode hours.

Allocation of Inactive/Off Mode Hours

DOE is proposing to allocate half of the non-active hours to inactive mode and half to off mode for dishwashers, conventional ovens, and conventional cooktops with electronic controls plus a mechanical on/off switch. 75 Fed. Reg. 75306, 75310, 75311. We believe that it is appropriate to allocate a portion of the inactive/off hours to off mode for these products given the potential energy-saving benefits of mechanical on/off switches that allow the consumer to reduce the power consumption of the product when not in use. However, we are concerned about the potential for gaming if there is no specification regarding where the switch must be placed on the product in order to receive credit. For example, a manufacturer could place a switch in a location where it would obviously not be intended for consumer use. In this case, allocating half of the inactive/off mode hours to off mode would clearly not be appropriate. To attempt to avoid any potential gaming, we encourage DOE to specify that the switch must be placed in a specific location and/or be intended for consumer use in order for half of the inactive/off mode hours to be allocated to off mode.

Alternative Methodology for Allocation of Hours

In the NOPR, DOE presents an alternative methodology for the allocation of the non-active hours for dishwashers, dehumidifiers, ovens, and ranges. 75 Fed. Reg. 75306, 75308, 75310, 75313. While we recognize that currently the annual energy consumption in certain inactive modes may on average represent a small fraction of total annual energy consumption, we encourage DOE to establish test procedures that include measurements of energy consumption in each inactive mode in order to provide an incentive to manufacturers to reduce power consumption in these modes and to prevent potential loopholes.

DOE test results of dishwashers illustrate the potential implications of not measuring the power consumption in cycle finished mode, as an example. The test data show that power consumption in cycle finished mode ranged from 0.24-4.18 W.¹³ In addition, for some products the measured power levels in cycle finished mode were significantly higher than the power levels in inactive/off mode. For example, the power consumption of Unit 3 was 0.03 W in inactive/off mode and 2.19 W in cycle finished mode while the power consumption of Unit 4 was 1.42 W in inactive/off mode and 4.18 W in cycle finished mode.¹⁴ A test procedure that does not measure power consumption in cycle finished mode would effectively ignore differences in cycle finished mode energy consumption among products as well as significant differences between power consumption in inactive/off mode and power consumption in cycle finished mode.

¹² See, for example, <http://www.geappliances.com/search/fast/infobase/10000206.htm>.

¹³ Docket Item: EERE-2010-BT-TP-0039-0005.

¹⁴ Ibid.

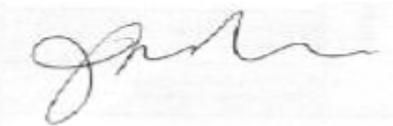
In addition, if the test procedures do not measure power consumption in each inactive mode, the energy consumption of any new features in these modes that are introduced to products will not be captured. The functionality of products can change very rapidly while test procedures are only required to be reviewed every seven years. This means that it is important that the test procedures not only capture energy-consuming features of current products but that they also allow for capturing, to the extent possible, any energy-consuming features that may be subsequently introduced.

Thank you very much for considering these comments.

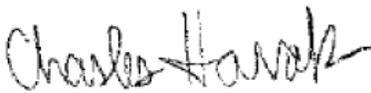
Sincerely,



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