Appliance Standards Awareness Project
Alliance to Save Energy
Northwest Energy Efficiency Alliance
Natural Resources Defense Council
Northeast Energy Efficiency Partnerships
Northwest Power and Conservation Council

October 4, 2016

Mr. Jeremy Dommu
U.S. Department of Energy
Building Technologies Office
Mailstop EE-5B
1000 Independence Avenue, SW
Washington, DC, 20585-0121

Docket Number: EERE-2016–BT–STD–0022

RIN: 1904-AD69

Dear Mr. Dommu:

This following comprises the comments of the Appliance Standards Awareness Project, the Alliance to Save Energy, the Northwest Energy Efficiency Alliance, the Natural Resources Defense Council, the Northeast Energy Efficiency Partnerships, and the Northwest Power and Conservation Council in response to the Department of Energy's notice of proposed rulemaking on energy conservation standards for the uninterruptible power supplies class of battery chargers (UPS) published August 5, 2016.

DOE's analysis of the proposed rule shows significantly increased benefits over DOE's 2012 proposed standards for the UPS product class. The co-signers commend DOE for this revised analysis and generally support DOE's NOPR for UPSs. However, we recommend that DOE adopt energy efficiency standards at TSL 3, rather than TSL 2 as proposed, in order to increase savings.

Overview and comments on DOE's analysis

With uninterruptible power supplies, only limited market or product energy consumption data are currently available. This is often the case with technologies that are being covered by efficiency standards for the first time simply because before a standard there is no reason to gather this information in a consistent form. UPS manufacturers also lack experience with energy efficiency standards, and with estimating the costs of compliance. As a result, DOE's UPS standards analyses may be overly conservative, and estimates of the cost of compliance provided by industry may be

overstated.[1] We believe that the combined effect of overly conservative assumptions has led to DOE to propose energy efficiency standards for UPSs that are less stringent than optimal.

For example, it is likely that DOE has overestimated the product conversion costs associated with the proposed standards because transformerless UPS technologies were excluded from the analysis.[2] Several manufacturers now offer both transformer and transformerless UPSs and manufacturers may follow a standards compliance strategy of shifting to lower-cost transformerless UPSs rather than redesigning transformer-based models.[3] The recent comments of the California investor-owned utilities to this docket provide further information documenting the rise of transformerless UPSs.

Similarly, during the public meeting UPS industry representatives claimed that the market for UPSs was shrinking because the personal computer market was shifting from desktops, which work with UPSs, to laptops which do not need them. A shrinking UPS market would reduce projected savings from the standards and constrain industry's ability to recover compliance costs. However, industry representatives also noted that UPSs are increasingly being used with other kinds of electronic devices including VOIP phone systems, modems, routers and networking equipment, which would seem to indicate an increasing market for UPSs.

DOE should adopt UPS standards at trial standards level 3

In the analysis for this NOPR, DOE analyzes four trial standards levels (TSLs) and proposes TSL 2. The only difference between TSL 2 and TSL3 is that TSL 3 would require efficiency level (EL) 2 for VFDs while TSL 2 would only require EL 1. The efficiency requirements for VIs and VFIs are the same for TSL 2 and TSL 3. Therefore, TSL 3 is very similar to TSL 2 but would provide greater savings.

If TSL 3 were chosen instead of TSL2, DOE's analysis projects that cumulative, full-fuel-cycle, national energy savings would increase by an additional 6.8% to 1.26 quads and carbon dioxide emissions would be reduced by an additional 6.4% to 76.7 million metric tons[4] over the 30 year analysis period. TSL 3 would also create a significant positive NPV for consumers, ranging from $749 million to $2.41 billion over the same period.

The NOPR states that DOE's choice of TSL 2 is due to a small increase in average net lifecycle costs (an average of $1.00 for 38% of consumers) for commercial applications of VFDs that would result from choosing TSL 3 relative to the no-standards case.[5] DOE also projects that both TSL 2 and TSL 3 would create a manufacturer production cost increase of 41% for VIs.[6] However, both of these findings were influenced by overly conservative assumptions.

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[1] Nadel, Steven and Andrew Delaski, *Appliance Standards: Comparing Predicted and Observed Prices*. ACEEE, July 2013 (report number E13D)

[2] Slide 18, 9/16/2016 DOE UPS standards public meeting presentation

[3] *"One of the major trends emerging in this market is the growing demand for transformerless UPS systems among end-users. This demand is because of the several advantages it offers over transformer-based UPS systems. Transformerless UPS solutions offer several advantages such as high efficiency, low capital expenditures, higher returns on investment, low operating cost, less weight, and low carbon footprint."* Businesswire http://www.businesswire.com/news/home/20150630006425/en/Research-Markets-Global-Transformerless-UPS-Market-2015-2019

[4] FR Vol. 81 No. 151 (8/5/16) pg 52237 Table V.28

[5] FR Vol. 81 No. 151 (8/5/16) pg 52225-6 Table V.5

[6] FR Vol. 81, No. 151 (8/5/16) pg 52230

The UPS Technical Support Document states that *"DOE assumed no price trend for UPSs, given feedback from manufacturers gathered in early 2015, as well as the lack of data suggesting components of this mature technology are likely to exhibit changes in price over time*[7]*."* During the public meeting DOE's consultant confirmed that average lifecycle savings estimates do not incorporate price learning. DOE applied this conservative assumption to UPSs despite the fact that the agency has developed and deployed a price learning approach based on Lawrence Berkeley National Laboratories research to other product categories. According to a 2013 LBNL report[8], DOE has applied learning-curve based cost adjustments to regulatory impact assessments for at least half a dozen product minimum energy performance standards dating back to 2011, including such mature product categories as residential clothes washers and dishwashers. DOE also applies a price learning module in the analysis supporting the general service lighting NOPR published earlier this year.

In an increasingly connected world, the reliability of data networks is becoming increasingly important, which should tend to increase the market for UPSs. The growth of transformerless UPSs is only one example of how this product category continues to evolve, not unlike the digital electronic devices they are designed to power. It seems unreasonable to assume that once UPS standards are in place, and once manufacturers have adapted to their requirements, that there would no price erosion of that kind that is typically observed in competitive markets for electronic devices. We believe that if price learning were incorporated into DOE's UPS analysis that projected manufacturer production costs would be lower, that average lifecycle savings would be higher, and that TSL 3 would be more clearly the optimal choice for the new UPS standards.

We appreciate the opportunity to provide these comments and look forward to the final rule.

Sincerely,

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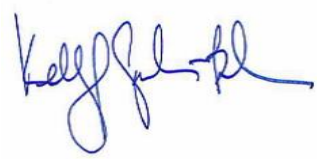

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[7] Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Uninterruptible Power Supplies, Section 10-4. DOE, July 2016

[8] Taylor, M. and S. K. Fujita. *Accounting for Technological Change in Regulatory Impact Analyses: The Learning Curve Technique*. 2013. Lawrence Berkeley National Laboratory: Berkeley, CA. Report No. LBNL–6195E.

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