

October 20, 2015

Ms. Brenda Edwards, EE-41
Office of Energy Efficiency and Renewable Energy
Energy Conservation Program for Consumer Products
U.S. Department of Energy
1000 Independence Avenue, SW.
Washington, DC 20585-0121

Docket Number: EERE-2014-BT-TP-0044
RIN: 1904-AD45

Dear Ms. Edwards:

This letter constitutes the comments of the Natural Resources Defense Council (NRDC), and the Appliance Standards Awareness Project on the Department of Energy (DOE, the Department) notice of proposed rulemaking (NOPR) for the Battery Chargers Rulemaking.

The Natural Resources Defense Council (NRDC) is an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Livingston, Montana, and Beijing. NRDC's top institutional priorities are curbing global warming and creating a clean energy future. Energy efficiency is the quickest, cleanest, cheapest solutions to global warming and other energy-related problems. Cost-effective energy efficiency standards help to ensure that consumer and commercial products provide the same level of comfort and service using less energy, with benefits for consumers, the environment and the electricity grid. For more than 30 years, NRDC has advocated for stronger federal and state energy efficiency standards for household appliances and commercial products, and for strong implementation and enforcement of these standards, including better test procedures.

The Appliance Standards Awareness Project organizes and leads a broad-based coalition effort that works to advance, win and defend new appliance, equipment and lighting standards which deliver large energy and water savings, monetary savings and environmental benefits.

The Northwest Energy Efficiency Alliance (NEEA) identifies barriers and opportunities to increase the market adoption of efficiency. We work on behalf of over 140 utilities, so our actions help transform the Northwest energy market by creating demand and setting new standards for cost-effective energy efficiency.

We thank DOE for its efforts in developing energy conservation standards for battery charger systems and in revising the test procedure that supports such standards. Over 500 million battery charger systems were sold in the United States in 2011, consuming more than 10 billion kilowatt-hours annually. Battery charger systems sales are continuing to increase with the proliferation of consumer electronics products, the trend toward mobile product use, and the rapid drop in the price of batteries.

We believe that energy efficiency standards play a critical role in reducing the energy used by electrical equipment, thereby reducing carbon emissions, and the environmental, economic and

public health impacts of electricity generation. A repeatable and representative test procedure is critical to enabling the development and enforcement of effective energy efficiency standards.

We appreciate the opportunity to comment on the battery charger systems test procedure notice of proposed rulemaking (NOPR). We generally support DOE's goal to clarify the test procedure, and to harmonize it with applicable international standards where necessary. In summary:

1. Battery selection criteria for multi-voltage, multi-capacity battery chargers

The signatories are concerned that the proposal in the SNOPR to revise the selection criteria for multi-voltage, multi-capacity battery chargers will fail to adequately identify non-compliant products, and might also create different loopholes both for battery chargers shipped with a battery, and battery chargers shipped without batteries, potentially leading to missed energy savings.

2. Back-up battery chargers

We strongly recommend that battery backup systems be included in the scope of the test procedure so that they can be covered under DOE's battery chargers standard. Alternatively, we suggest DOE exclude battery backup systems as a covered product in the SNOPR in order to allow the California Energy Commission to continue to enforce its standards for these products until DOE Computer and Battery Backup Systems (CBBS) standards become effective.

3. Discharge rate and conditioning for lead acid batteries

We do not support DOE's proposed changes in this area. The improvements in representativeness are debatable, and the loss in energy savings is substantial.

Below we provide our detailed comments and recommendations on these issues.

1. We are concerned that DOE's proposal for selection criteria for multi-voltage, multi-capacity battery chargers will fail to adequately identify non-compliant products, and might also create new loopholes resulting in significant missed energy savings.

We agree with DOE's proposal to add an additional criterion that a battery charger be tested in combination with the battery which results in the highest maintenance mode power. We believe this would adequately address some of the ambiguity in the current test procedure. We also suggest that DOE resolve additional ambiguity in the discussion regarding Table 4.1, specifically the phrase "highest voltage and/or highest charge capacity" by rewording it as follows: "highest voltage, and if multiple batteries meet this criterion, the one with the highest charge capacity".

We are also concerned that DOE's proposal to test only one battery per "basic model" could create two different types of loopholes and we recommend that DOE clarify the scope of this "a la carte" battery selection provision to ensure it is not misinterpreted or exploited. The current language states that "there will be only one set of test results, and a single rating, for each basic model of battery charger". It is not clear whether this statement is valid only for battery chargers that ship without a battery, or for all battery chargers.

For battery chargers which are typically sold with a battery we are concerned that the proposed revision could allow a manufacturer to test a battery charger with the highest capacity battery that it is capable of charging, rather than the battery the charger is actually sold with. Devices like power tools and laptops are typically sold with a battery but may be capable of charging batteries of multiple voltages and charge capacities. Efficiency test results for a battery charger paired with the highest charge capacity compatible battery tend to be better than tests of the same battery charger with a perhaps more typical, lower charge capacity battery. Manufacturers should be required to test such battery chargers with the battery the device is typically shipped with. Regardless of what testing approach DOE takes, the Department should reaffirm that all covered battery chargers should be compliant with the DOE standard when charging all compatible batteries. DOE should make clear that certifying compliance for a basic model using cherry-picked components does not relieve manufacturers of the obligation to have all products meet the standard.

We are opposed to DOE's proposal to allow multi-capacity, multi-voltage, multi-chemistry battery chargers to be tested with a single battery when they are sold without a battery. We recommend that DOE retain the battery selection criteria in the current test procedure. We appreciate the assertion made by DOE that "testing multiple batteries produces different results for each test battery" but, again, believe that regardless of what testing approach DOE takes, the agency should re-affirm that all products sold must comply with the standard's minimum efficiency level. DOE test results are not typically used as marketing points between competing products. We believe that the improved accuracy this approach would provide is more important than the decrease in comparability of the test results.

If DOE is committed to changing the selection criteria for multi-voltage, multi-capacity battery chargers sold with batteries, we recommend that manufacturers be required to test their battery chargers with the lowest charge capacity compatible battery, and if multiple batteries meet this criterion, the compatible battery with the lowest voltage and lowest charge capacity.

2. The exclusion of back-up battery chargers embedded in continuous use devices, including Uninterruptible Power Supplies (UPS) risks reducing energy savings nationally.

DOE states that it intends to cover battery backup systems under the Computers and Back-up Battery Systems (CBBS) standards, and therefore proposes to remove battery backup systems from the battery chargers test procedure and include them in the future CBBS test procedure instead.

We believe that this proposal poses several problems:

It may create confusion with regards to California's standards. The CBBS rulemaking is in its early stages and the first proposed test procedure and standards have not been released yet. The timing and eventual completion of the CBBS test procedure and standards are uncertain. Excluding battery backup systems from the federal battery chargers test procedure, which is used for California battery chargers standard, could make California standard unenforceable, at least until the federal CBBS test procedure is adopted and becomes effective.

It would cause backsliding on savings from California standards for UPS products until 2021 or later. DOE's upcoming battery chargers standards would not be able to cover back-up battery systems unless they are covered by the federal battery chargers test procedure. Back-

up battery systems also would not be covered by federal standards until CBBS standards come into effect, five years after adoption. Unless California is able to continue to enforce its standards for battery backup systems until DOE's standards come into effect, there is a risk of a coverage gap that could last more than five years. This gap could result in the loss of **up to 683 gigawatt-hours** in annual electricity savings from the California standards. The California standards for consumer uninterruptible power supplies have been in effect since February 1, 2013 and will go into effect on January 1, 2017 for non-consumer UPSs unless pre-empted by the proposed DOE battery chargers test procedure NOPR.

It may leave certain battery backup systems uncovered: The CBBS standard will most likely affect a narrower scope of back-up battery charger systems than would the battery charger test procedure NOPR. There are important non-computer related battery backup systems, such as for modems, that the CBBS test procedure may not cover. Excluding battery backup systems from the federal battery chargers test procedure could prevent the setting of standards for non-computer related devices, allowing them to be unnecessarily inefficient.

Instead, we recommend that DOE choose one of the two following approaches:

To maximize energy savings, we recommend that DOE to keep battery backup systems in the battery chargers test procedure and standards, at least until the CBBS standards go into effect. Setting federal standards for battery backup systems as proposed in the battery chargers test procedure NOPR and standards SNOPR would save an additional 240 gigawatt-hours of electricity annually, on top of the 683 gigawatt-hours already saved by California standards.

Alternatively, DOE could explicitly exclude UPSs from the definition of battery chargers. This would let California standards remain in effect until the federal CBBS standards take effect in five or more years.

3. We do not support DOE's proposed changes regarding discharge rate and conditioning for high-capacity lead acid batteries.

DOE proposes to apply conditioning before testing lead-acid batteries, and to let manufacturers choose between three discharge rates when testing lead-acid batteries rated above 1000 Wh, in order to increase representativeness. While we generally support making the test procedure more representative of typical use, DOE's proposed changes may not actually increase representativeness of the test procedure for the following reasons:

- Due to the natural degradation of battery capacity during normal use the actual average energy consumption of battery chargers in the field is lower than that measured when the chargers are tested with new batteries. While we have not attempted to model average battery degradation, it is possible that the C/5 discharge rate and lack of battery conditioning may actually be more representative of average field charging efficiency than DOE's proposed change.
- Slower discharge rates would not be representative of golf carts, one of the largest applications for batteries with capacities greater than 1000 Wh. Discharge rates vary by application and golf carts typically have high discharge rates. Allowing golf cart chargers to be tested at a lower discharge rate would yield artificially higher efficiencies than experienced in actual use.

In addition, DOE's proposal would also have additional negative consequences that would backslide on California standards for chargers with lead-acid batteries. Assuming that the test data used by DOE to determine these proposed standards was collected using the existing test procedure, it would significantly weaken DOE standards. Lead acid battery capacity increases by more than 10 percent when going from C/5 (5-hour discharge) to C/20 (20-hour discharge according to Peukart's Law. This makes it much easier for battery chargers to achieve standards levels when tested C/20 than at C/5. DOE's proposal for discharge rates for lead-acid batteries would effectively result in setting standards at levels that are significantly lower than the maximum improvement in energy efficiency, which is technologically feasible and cost-effective.

Furthermore, giving manufacturers a choice between three discharge rates makes the test procedure less repeatable, and may reduce energy savings from the standards by allowing manufacturers to optimize their test results and comply using a discharge rate that is different from the rate that was found to be cost-effective by DOE when setting the standards.

Conditioning the battery before testing would increase the representativeness of the test procedure for new battery chargers, but it would also allow lower efficiency battery chargers to comply with the standard than does the current test procedure. For these reasons, we do not support the changes to the discharge rate and battery conditioning proposed by DOE. The improvement in representativeness is debatable, and the negative impacts on energy savings are very substantial.

If DOE decides to make changes to the discharge rates for lead-acid batteries in the test procedure NOPR, we suggest that DOE prescribe specific discharge rates instead of leaving that choice to manufacturers. While we believe that C/5 is a reasonable, and perhaps even a conservative discharge rate for golf cars and other vehicle motorization applications, a different discharge rate could potentially be developed for other applications.

In conclusion, we assume that the test data analyzed to develop the standards included in DOE's SNOPR were collected using the current battery chargers test procedure. The proposed changes in DOE's battery chargers test procedure NOPR could lead to changes in the measured performance of covered battery chargers. Depending upon the changes to the test procedure that are eventually adopted, we recommend that DOE reassess the proposed standard levels for product categories 5, 6, and 7 in order to achieve the maximum efficiency improvements that are cost-effective and technologically feasible. However, we do not advocate additional testing in order to avoid delaying the battery chargers standard rulemaking. Instead we recommend DOE adjust standards levels using battery discharge and capacity tables per Peukart's Law.

Thank you for considering our comments.

Sincerely,



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