May 10th, 2023

Department of Energy
docket number EERE-2020-BT-STD-0013

Dear Sirs,

Our comments on 2023-03-15 Energy Conservation Program: Energy Conservation Standards for Battery Chargers; Notice of proposed rulemaking

The Japan Machinery Center for Trade and Investment ("**JMC**") is a non-profit organization. It was established in December 1952 in accordance with the Japanese Export and Import Trade Law under the authorization of the Minister of Economy, Trade and Industry of Japan. The objective of the JMC is to engage in activities that enhance the common benefit of member companies and promote the sound development of international trade and investment by the machinery industry. JMC comprises member companies engaged in machinery and systems-related exports and foreign investments such as machinery manufacturers, trading houses and engineering companies. At present, the total number of JMC member companies is about 240.

Our committee handles environmental and product safety issues regarding products for trade and is strongly concerned with overseas environment- and product safety-related regulations on products. From this standpoint, we would like to comment on 2023-03-15 Energy Conservation Program: Energy Conservation Standards for Battery Chargers; Notice of proposed rulemaking (NOPR: docket number EERE-2020-BT-STD-0013)

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If you have any questions, please feel free to contact our secretariat (Mr. Chiaki Morikawa, E-mail: morikawa@jmcti.or.jp)).

Sincerely yours,

KANNO Yasuhiko

Chairman
Environment Law Committee

Our Comment on 2023-03-15 Energy Conservation Program: Energy Conservation Standards for Battery Chargers; Notice of proposed rulemaking (NOPR: docket number EERE-2020-BT-STD-0013)

In order to achieve carbon neutrality by 2050, which is the U.S. energy policy, it is expected that more and more battery chargers will be used in the future.
The NOPR (docket number EERE-2020-BT-STD-0013), 6. "Need of the Nation to Conserve Energy," states that "Energy conservation resulting from potential energy conservation standards for battery chargers is expected to yield environmental benefits in the form of reduced emissions of certain air pollutants and greenhouse gases." We fully support this proposal from this perspective.
However, as a result of our review of the feasibility of implementation in accordance with this NOPR in electrical and electronic equipment and machinery products, we have found some provisions for which the technical response would be impracticable, and we would like to submit the following comments.

The Off mode power (Poff) for Product class 1a, 1b, and 2a is proposed to be 0W in Table IV.5-BASELINE EFFICIENCY LEVEL OR CSL 0 FOR BATTERY CHARGERS.
The Off-mode power (Poff) limit of "0W" is technically unfeasible for battery chargers within the scope of NOPR III. General Discussion B, unless the power supply to the battery charging circuit is mechanically disconnected. In other words, it is technically impossible to comply with this regulation unless the primary circuit of the primary power supply is cut off by a manual on-off switch.
Therefore, we would like to propose the following:

1. Change the definitions of manual on-off switch, off mode, etc. (see Option (1) to (3) below)

In Appendix Y1 to Subpart B of Part 430
eCFR :: Appendix Y1 to Subpart B of Part 430, Title 10 -- Uniform Test Method for Measuring the Energy Consumption of Battery Chargers

・Option (1) 2.16. Manual on-off switch
The definition of "2.16. Manual on-off switch" is altered as follows.
2.16. Manual on-off switch is a switch activated by the user to control primary power reaching the battery charger: "primary" is added.
or

・Option (2) 2.20. Off mode

The definition of "2.20. Off mode" is altered as follows.

Off mode is the condition, applicable only to units with manual on-off switches, in which the battery charger:

(a) Is connected to the main electricity supply;

(b) Is not connected to the battery; and

(c) All manual on-off switches on the primary AC circuit are turned off.

: For (c), "on the primary AC circuit" is added.

or

・Option (3) TABLE IV.5 in NOPR

TABLE IV.5—BASELINE EFFICIENCY LEVEL OR CSL 0 FOR BATTERY CHARGERS

Off mode power (Poff) with power switch on primary circuit turned off

: The addition of "with power switch on primary circuit turned off" follows "Off mode power (Poff)."

2. Modification of definition of standby mode

We would like to propose that the baseline levels for maintenance mode and standby mode be separated and that the definition of standby mode be defined as only "no-battery mode power," as the present regulation.

According to the proposed test procedure Y1, the standby mode power is defined as the sum of the power in maintenance mode and the no-battery mode power. (3.3.13) However, in reality, standby mode is the standby state without battery, which is not accurately indicated in this definition, which includes the power during maintenance mode. This is also what each commenter questioned in EERE-2020-BT-TP-0012 as an opinion on the November 2021 NOPR. The DOE's response in this case includes the following statement.

"DOE would be able to representatively capture the energy usage metrics for battery chargers in these states regardless of how much time the battery charger spends in each state, while still giving manufacturers freedom in design flexibility."

However, rechargeable batteries with self-discharge characteristics, such as nickel-hydrogen secondary batteries, need to be charged intermittently during maintenance mode, and the power increases over time, so this state would not be consistent with the above statement.

3. To set the power consumption for off mode to 0.5W or less

It is not feasible to set the power consumption for off mode to 0W, and we would like to propose that it be set to 0.5W or less.

(1) The only way to achieve power consumption of 0W is to mechanically disconnect the electrical circuit. But forcing this is not feasible for maintaining battery functionalities and the energy-saving design according to the following reasons.

1) In order to maintain battery performance and ensure safety, it is necessary to charge the battery appropriately for its characteristics and prevent overcharging.
2) Especially chargers with multiple ports require complex controls to meet the above requirements.
3) For energy saving, it is preferable to have a function that automatically turns off the battery charger within a certain period after completion of charging or when the power is turned on, but the battery is not connected. To enable such a function, it is difficult to design the battery charger with a function to mechanically disconnect the electrical circuit.
4) If the electrical circuit is not mechanically disconnected, it is impossible to eliminate the power consumption to 0W. Considering the case where an external power supply is used, it is necessary to take its power consumption into account. Therefore, the off-mode power standard must be higher than the maximum permitted no-load power of the external power supply.

(2) There are many consumer products which have a function to charge their removable battery, and the energy conservation standards for battery charger should be legislated so that this kind of product can comply. Some consumer products with a charging function allow the user to attach and detach the battery for the following reasons.

1) To be able to easily replace the battery when it deteriorates.
2) To have spare charged batteries available for in case the user runs out the battery in the consumer product outside its usual location.
3) There are products that have a charging function in the consumer product itself (scanner, printer, etc.), and the battery can also be charged with a battery charger sold separately by removing the battery from the consumer product.

Making it possible to replace deteriorated batteries is a design concept that extends the product life and reduces environmental impact, as required by the proposed EU Battery Regulation to replace the current EU Battery Directive, and such products are expected to increase in number in the future.

(3) In the following explanation in 2.6 in Section 2. Definitions of Appendix Y1 to Subpart B, the test procedure, a removable battery in a consumer product with charging function can be interpreted as a detachable battery.

"The word 'intended' in this context refers to whether a battery has been designed in such a way as to permit its removal or disconnection from its associated consumer product."

If a battery is classified as a "detachable battery," the relevant consumer product with charging function cannot be categorized as there being no manual on-off switch based on 2.16 in Section 2. Definitions and/or Section 3.3.12(b) of Appendix Y1. And the consumer product can be interpreted as having an off mode.

In that case, the consumer product has a complex circuit for the main functions other than charging consumer devices, such as scanning and printing, and has the ability to automatically turn off to comply with Regulation (EC) 1275/2008 (EU Ecodesign Regulation Lot 6: *standby* and off mode electric power consumption), and mechanical disconnection of the electrical circuit is not feasible.

Currently, the power consumption standard for "off status" for products with the function of automatic transition into off mode, which is widely recognized internationally and reflected in many products, is "0.5W or less" in the EU Ecodesign Regulation Lot 6. Therefore, we propose 0.5W as the power consumption limit value for off mode. By this threshold value, the energy conservation standards will provide energy saving without contradicting the power consumption of no load of the external power supply and the function of automatic transition into off mode.

EU ErP Lot 6 Official Journal

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008R1275-20210301

4. Certain transitional measures for spare parts (service parts)

We would like to recommend DOE to set some additional transitory period for battery chargers that are made available by a manufacturer as spare parts or service parts (hereinafter referred to as "spare parts") for an end-use product produced prior to the effective date. Details are as follows.

(1) In many cases, the battery chargers are not sold as independent products but often marketed as the parts of their end-use products. When the battery chargers bundled with the end-use products become out-of-order before the products, chargers for replacement would be needed. Such spare parts contribute to extend the products' lifetime.

(2) Battery chargers have a similar nature to EPS in this point. The Federal Energy Regulation on EPS gives an additional transitional period of about five years for spare parts (seven years for the first regulation and four years for the second regulation).

(3) The current Federal regulations for battery chargers, enacted in 2019, have comparable standards to California's appliance efficiency regulations for battery chargers which were enacted in 2013. As five years had passed since California's regulations were enacted at the point of effect, no grace period was established for the current Federal regulations for battery chargers. However, since the proposal establishes new standards, we believe that the same transitional period should be provided for battery chargers as supplies and spare parts as for EPS.

More concretely, the current (z) (1) of Section 430.32 should be amended as follows. Please see the underlined sections.

(z) *Battery chargers.*

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(ii) (A) Except as provided in paragraphs (z)(iii), battery chargers manufactured on or after *[date two years after publication of the final rule]*, must meet the following active mode energy, standby mode power, and off-mode power standards:

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(iii) Battery chargers are not subject to the energy conservation standards of paragraph (z) (ii) of this section if a battery charger-

(A) is manufactured during the period beginning on *[the date of compliance for the energy conservation standards of paragraph (z)(1)(ii)]*, and ending on *[five years after the date of compliance for the energy conservation standards of paragraph (z)(1)(ii)]*;

(B) meets, where applicable, the standards under paragraph (z)(1)(i) of this section, and has been certified to the Secretary as meeting those standards; and

(C) is made available by the manufacturer only as a service part or a spare part for an end-use product that was manufactured before *[the date of compliance for the energy conservation standards of paragraph (z)(1)(ii)]*.

5. Postponement of Effective Date

The proposed revisions to this standard, 10 CFR Part 430, include regulations for wireless power charging used in non-humid environments, and a draft regulation was published on March 15. However, there are many points in the proposed revision that do not take into account the characteristics of nickel-hydrogen secondary batteries, and the content of the proposed revision hinders the progress of wireless charging technology for nickel-hydrogen secondary batteries. Therefore, we propose to either limit the scope of fixed wireless hydration to wireless connectivity in wet environments as before, or to extend the effective date from two years after the final rule comes into effect to four years later.

Compared to lithium-ion secondary batteries, nickel-hydrogen secondary batteries have a lower energy density and lower charging efficiency. While wireless charging technology for nickel-hydrogen secondary batteries is still in development and lags behind that of lithium-ion secondary batteries, nickel-hydrogen secondary batteries are less expensive than lithium-ion secondary batteries, making them affordable and accessible to many consumers. The proposed revisions will stifle the technological development of nickel-hydrogen secondary batteries, and this will result in fewer choices for consumers.

Under the proposed test criteria, the characteristics of nickel-hydrogen secondary batteries are expected to be unfavorable. As an example, owing to their self-discharge characteristics, nickel-hydrogen secondary batteries tend to have higher power in standby mode because the reduction of maintenance power is more stringent than that of lithium-ion secondary batteries. Nickel-hydrogen secondary batteries have lower charging efficiency than lithium-ion secondary batteries, so it is necessary to develop technology to increase the efficiency of chargers.

Improving the efficiency of the charging IC, which is an elemental technology, is extremely difficult and technological development is expected to take a long time because it requires solving many constraints such as material development, fine-tuning of control methods, heat generation, and miniaturization.

For the above reasons, it is expected to take at least 48 months in total: 24 months for technological development, 18 months for prototype creation and reliability evaluation, 4 to 5 months for conformity assessment by a third-party organization, and 1 to 2 months before the product is integrated into production lines. Therefore, we would like to request an extension to four years.

6. Correction of errors

42 U.S.C. 6291-6309; 28 U.S.C. 2461 note.

2. Amend § 430.32 by revising paragraph (z) (1) to read as follows:

§ 430.32

Energy and water conservation standards and their compliance dates.

* * * * *

(z) Battery chargers. (1)(i) Battery chargers manufactured on or after June 13, 2018, and before [date two years after publication of the final rule], must have a unit energy consumption (UEC) less than or equal to the prescribed “Maximum UEC” standard when using the equations for the appropriate product class and corresponding rated battery energy as shown in the following table:

In the table after Energy and water conservation standards and their compliance dates. The formula for “Maximum active mode energy E a (Wh)” in “2b Medium-Energy” is “1.367*Ebatt + -9.560,” which is both + and -, but we believe the - is an editorial error. Please correct to “1.367*Ebatt +9.560.”

(Reason of correction)

With a Battery energy E batt 100(Wh) with Product Class “2a Low-Energy,” when the formula for “2a Low-Energy” is “1.222*Ebatt + 4.980” and the formula for “2b Medium-Energy” is provisionally “1.367*Ebatt -9.560,” the limit standard value will be more stringent for “2b Medium-Energy.”

End