[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 430

EERE-2020-BT-STD-0006

RIN 1904-AD87

Energy Conservation Program: Energy Conservation Standards for External Power Supplies

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Request for Information.

SUMMARY: The U.S. Department of Energy ("DOE") is initiating an effort to determine whether to amend the current energy conservation standards for External Power Supplies ("EPS"). Under the Energy Policy and Conservation Act, as amended, DOE must review these standards at least once every six years and publish either propose new standards for EPSs or a notice of determination that the existing standards do not need to be amended. This request for information ("RFI") solicits information from the public to help DOE determine whether amended standards for EPSs would result in significant energy savings and whether such standards would be technologically feasible and economically justified. As part of this RFI, DOE seeks comment on whether there have been sufficient technological or market changes since the most recent standards update that may justify a new rulemaking to consider more stringent standards. Specifically, DOE seeks data and information that could enable the agency to determine whether DOE should propose a "no new standard" determination because a more stringent standard: would not result in a significant savings of energy; is not technologically feasible; is not economically justified; or any combination of the foregoing. DOE welcomes

written comments from the public on any subject within the scope of this document (including those topics not specifically raised), as well as the submission of data and other relevant information.

DATES: Written comments and information will be accepted on or before [**INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***].

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *http://www.regulations.gov*. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2020–BT–STD–0006, by any of the following methods:

1. *Federal eRulemaking Portal*: *http://www.regulations.gov*. Follow the instructions for submitting comments
2. *E-mail*: to *EPS2020STD006@ee.doe.gov* Include the docket number EERE-2020-BT-STD-0006 in the subject line of the message.
3. *Postal Mail*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE–5B, 1000 Independence Avenue, SW., Washington, DC 20585– 0121. Telephone: (202) 287-1445. If possible, please submit all items on a compact disc ("CD"), in which case it is not necessary to include printed copies.
4. *Hand Delivery/Courier*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC 20024. Phone: (202) 287-1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimilies (faxes) will be accepted. For detailed instructions on submitting comments and additional information on the rulemaking process, see section III of this document.

Docket: The docket for this activity, which includes *Federal Register* notices, comments, and other supporting documents/materials, is available for review at *http://www.regulations.gov*. All documents in the docket are listed in the *http://www.regulations.gov* index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at *http://www.regulations.gov/#!docketDetail;D=EERE-2020-BT-STD-0006*. The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section III for information on how to submit comments through *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT:

Mr. Jeremy Dommu, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-9870. E-mail: *ApplianceStandardsQuestions@EE.Doe.Gov*.

Mr. Michael Kido, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586–8145. E-mail: *Michael.Kido@hq.doe.gov*

For further information on how to submit a comment, or review other public comments and the docket contact the Appliance and Equipment Standards Program staff at (202) 586-6636 or by email: *ApplianceStandardsQuestions@ee.doe.gov*

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Introduction

A. Authority and Background

The Energy Policy and Conservation Act, as amended ("EPCA"),[1] authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B[2] of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles. These products include

[1] All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Pub. L. 115–270 (October 23, 2018).

[2] For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

external power supplies ("EPSs"), the subject of this document. See 42 U.S.C. 6295(u) EPCA, as amended by the Energy Independence and Security Act of 2007, Pub. L. 110-140 ("EISA"), also defined a subset of EPSs, called Class A EPSs -- devices that are "able to convert to only 1 AC or DC output voltage at a time" and have "nameplate output power that is less than or equal to 250 watts" among other characteristics.[3] (42 U.S.C. 6291(36)(C)(i)) These devices are also, by definition, (1) designed to convert line voltage AC input into lower voltage AC or DC output, (2) sold with (or intended to be used with) a separate end-use product that constitutes the primary load, (3) contained in a separate physical enclosure from the end-use product, and (4) connected to the end-use product via a removable or hard-wired male/female electrical connection, cable, cord or other wiring. See 42 U.S.C. 6291(36)(C)(i). EPCA prescribed energy conservation standards for Class A EPSs (hereafter referred to as the "Level IV standards," the nomenclature of which is based on the marking required in accordance with the International Efficiency Marking Protocol) that became required on July 1, 2008. EPCA also directed DOE to conduct 2 cycles of rulemakings to determine whether to amend these standards. (42 U.S.C. 6295(u)(3))

Following the EISA amendments, Congress further amended EPCA to exclude EPSs used for certain security and life safety alarms and surveillance systems manufactured prior to July 1, 2017, from the statutorily-prescribed "no-load" energy conservation standards. (Pub. L. 111-360 (January 4, 2011) (codified at 42 U.S.C. 6295(u)(3)(E)). EPCA's EPS provisions were again amended by the Power and Security Systems ("PASS") Act, which extended the rulemaking deadline and effective date established under the EISA 2007 amendments from July

[3] Congress also excluded certain devices from the Class A EPS definition, specifically certain devices requiring listing and approval as a medical device and devices that either (1) power the charger of a detachable battery pack or (2) charge the battery of a product that is fully or primarily motor operated. See 42 U.S.C. 6291(36)(C)(ii).

1, 2015, and July 1, 2017, to July 1, 2021, and July 1, 2023, respectively. (Pub. L. 115-78 (November 2, 2017) (codified at 42 U.S.C. 6295(u)(3)(D)(ii))). The PASS Act also extended the exclusion of certain security and life safety alarms and surveillance systems from no-load standards until the effective date of the final rule issued under 42 U.S.C. 6295(u)(3)(D)(ii) and allows the Secretary to treat some or all EPSs designed to be connected to a security or life safety alarm or surveillance system as a separate product class or to further extend the exclusion. See 42 U.S.C. 6295(u)(3)(E)(ii) and (iv).

Most recently, on January 12, 2018, the EPS Improvement Act of 2017, Pub. L. 115-115, amended EPCA to exclude the following devices from the EPS definition: power supply circuits, drivers, or devices that are designed exclusively to be connected to and power (1) light-emitting diodes providing illumination, (2) organic light-emitting diodes providing illumination, or (3) ceiling fans using direct current motors.[4] (42 U.S.C. 6291(36)(A)(ii))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA specifically include definitions (42 U.S.C. 6291), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), energy conservation standards (42 U.S.C. 6295), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

[4] DOE amended its regulations to reflect the changes introduced by the PASS Act and EPS Improvement Act. 84 FR 437 (January 29, 2018).

Federal energy efficiency requirements for covered products established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297(a)-(c)) DOE may, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions set forth under EPCA. (See 42 U.S.C. 6297(d)).

DOE completed the first of two required rulemaking cycles in 2014 by adopting amended performance standards for EPSs manufactured on or after February 10, 2016. 79 FR 7846 (February 10, 2014) (setting amended standards to apply starting on February 10, 2016) ("February 2014 Final Rule"). The final rule amended the Level IV standards prescribed by Congress and separated EPSs into two groups regardless of whether they met the Class A criteria -- direct operation EPSs and indirect operation EPSs. The February 2014 Final Rule set new standards that applied only to direct operation EPSs (hereafter referred to as "Level VI standards"), which increased the stringency of the average active-mode and no-load power consumption metrics over the Level IV standards. Under this rule, Class A EPSs that could directly power a consumer product (excluding battery chargers) became subject to the Level VI standards, whereas a Class A EPS that requires the use of a battery to power a consumer product remained subject to the Level IV standards. Likewise, a non-Class A EPS that could directly power a consumer product (excluding battery chargers) became subject to efficiency standards for the first time (Level VI standards) -- non-Class A indirect operation EPS continued to remain free from any efficiency requirements. 79 FR 7865. The current energy conservation standards are located in title 10 of the Code of Federal Regulations ("CFR") part 430, section 32(w). The currently applicable DOE test procedures for EPS are at 10 CFR part 430, subpart B, appendix Z

("Appendix Z").

In implementing its standards, DOE provided more detailed guidance in an EPS test procedure rulemaking to help manufacturers and others determine whether a given device fell into the direct operation or indirect operation group. See 80 FR 51424 (Aug. 25, 2014). In that document, DOE noted that the separation between these two types of EPSs is based on their ability to power an end-use product when the product's battery is removed or depleted. If the product can still operate as intended when the battery is removed and the EPS is connected, the EPS is considered a direct operation EPS provided that the EPS operates a consumer product. If the product can only operate a battery charger or if the product cannot operate with the battery removed, it is considered an indirect operation EPS. 80 FR 51434-51435.

On December 6, 2019, DOE published a notice of proposed rulemaking (NOPR) for the EPS test procedure as codified at 10 CFR part 430, Subpart B, Appendix Z, "Uniform Test Method for Measuring the Energy Consumption of External Power Supplies." This notice was issued in response to several test procedure waivers, and stakeholder inquiries regarding testing methods for EPSs that incorporated certain newer technologies. Specifically, the proposed amendments address issues regarding the emergence of adaptive and multiple-output EPSs.

EPCA also requires that, not later than 6 years after the issuance of any final rule establishing or amending a standard, DOE evaluate the energy conservation standards for each type of covered product, including those at issue here, and publish either a notice of determination that the standards do not need to be amended, or a NOPR that includes new proposed energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6295(m)(1)) In making a determination that the standards do not need to be amended, DOE must evaluate whether amended standards (1) will result in significant conservation of energy,

(2) are technologically feasible, and (3) are cost effective as described under 42 U.S.C. 6295(o)(2)(B)(i)(II). (42 U.S.C. 6295(m)(1)(A); 42 U.S.C. 6295(n)(2)) Under 42 U.S.C. 6295(o)(2)(B)(i)(II), DOE must determine whether the benefits of a standard exceed its burdens by, to the greatest extent practicable, considering the savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of the standard. If DOE publishes a final determination that a standard does not need amending based on the statutory criteria, not later than 3 years after the issuance of DOE's determination, DOE must either make a new determination that standards for the product do not need to be amended or propose new energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6295(m)(3)(B)) DOE must make the analysis on which a determination is based publicly available and provide an opportunity for written comment. (42 U.S.C. 6295(m)(2))

In proposing new standards, DOE must evaluate that proposal against the criteria of 42 U.S.C. 6295(o), as described in the following section, and follow the rulemaking procedures set out in 42 U.S.C. 6295(p). (42 U.S.C. 6295(m)(1)(B) If DOE decides to amend the standard based on the statutory criteria, DOE must publish a final rule not later than two years after energy conservation standards are proposed. (42 U.S.C. 6295(m)(3)(A))

DOE is publishing this RFI to collect data and information to inform its decision consistent with its obligations under EPCA.

B. Rulemaking Process

DOE must follow specific statutory criteria when prescribing new or amended standards for covered products. EPCA requires that any new or amended energy conservation standard prescribed by the Secretary be designed to achieve the maximum improvement in energy or water efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A)) To determine whether a standard is economically justified, EPCA requires that the Secretary of Energy ("the Secretary") determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

(1) The economic impact of the standard on the manufacturers and consumers of the affected products;

(2) The savings in operating costs throughout the estimated average life of the product compared to any increases in the initial cost, or maintenance expenses likely to result from the imposition of the standard;

(3) The total projected amount of energy and water (if applicable) savings likely to result directly from the standard;

(4) Any lessening of the utility or the performance of the products likely to result from the standard;

(5) The impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the standard;

(6) The need for national energy and water conservation; and

(7) Other factors the Secretary of Energy considers relevant. (42 U.S.C. 6295(o)(2)(B)(i)(I)–(VII))

DOE fulfills these and other applicable requirements by conducting a series of analyses throughout the rulemaking process. Table I.1 shows the individual analyses that are performed to satisfy each of the requirements within EPCA.

Table I.1 EPCA Requirements and Corresponding DOE Analysis

EPCA Requirement	Corresponding DOE Analysis
Significant Energy Savings	• Shipments Analysis • National Impact Analysis • Energy and Water Use Determination
Technological Feasibility	• Market and Technology Assessment • Screening Analysis • Engineering Analysis
Economic Justification:	
1. Economic impact on manufacturers and consumers	• Manufacturer Impact Analysis • Life-Cycle Cost and Payback Period Analysis • Life-Cycle Cost Subgroup Analysis • Shipments Analysis
2. Lifetime operating cost savings compared to increased cost for the product	• Markups for Product Price Determination • Energy and Water Use Determination • Life-Cycle Cost and Payback Period Analysis
3. Total projected energy savings	• Shipments Analysis • National Impact Analysis
4. Impact on utility or performance	• Screening Analysis • Engineering Analysis
5. Impact of any lessening of competition	• Manufacturer Impact Analysis
6. Need for national energy and water conservation	• Shipments Analysis • National Impact Analysis
7. Other factors the Secretary considers relevant	• Employment Impact Analysis • Utility Impact Analysis • Emissions Analysis • Monetization of Emission Reductions Benefits • Regulatory Impact Analysis

As detailed throughout this RFI, DOE is publishing this document to seek input and data from interested parties to aid in the development of the technical analyses on which DOE will ultimately rely to determine whether (and if so, how) to amend the standards for EPSs.

II. Request for Information and Comments

In the following sections, DOE has identified a variety of issues on which it seeks input to aid in the development of the technical and economic analyses regarding whether amended standards for EPSs may be warranted.

As an initial matter, DOE seeks comment on whether there have been sufficient technological or market changes since the most recent standards update that may justify a new rulemaking to consider more stringent standards. Specifically, DOE seeks data and information that could enable the agency to determine whether DOE should propose a "no new standard" determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

Additionally, DOE recently published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018). In that RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE's intent in issuing the RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. DOE seeks comments, data and information on the issues presented in the RFI as they may be applicable to

EPSs.

A. Products Covered by this Process

This RFI covers those products that meet the definitions of various EPSs codified at 10 CFR 430.2. An EPS is defined as an external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product. 10 CFR 430.2. DOE's regulations also include more specific definitions of other EPS variants. See 10 CFR 430.2.

DOE is interested in any feedback stakeholders may have on the classification of specific types of EPSs but notes that the EPS definition is established by statute. (See 42 U.S.C. 6291(36)(A)) There are products that would initially appear to be within the broad statutory definition of EPS, such as: consumer devices with multiple primary functions one of which is an EPS; and, wireless power supplies. In each of these examples, a circuit is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product. DOE is seeking information on the technical differences between such products and other products that are EPSs.

1. Consumer devices with auxiliary power supply function

The ubiquitous nature of universal serial bus ("USB") devices as charging and communication platforms has led many manufacturers to embed USB ports within consumer devices whose primary function may not be to serve as an external power supply. (A universal serial bus is a type of interface that enables communication between various devices and a host controller.) With ever improving specifications such as 100W of power and 10 gigabits per

second (Gbps) of throughout data, DOE anticipates the presence of embedded USB ports to become even more commonplace. This projected development raises the question about whether these products are EPSs and subject to the EPS standards. This section addresses this topic and seeks feedback from interested parties on specific questions.

The USB specification, published by the USB Implementers Forum[5], requires any USB output port, even those embedded in other products, to output a DC voltage. Therefore, a consumer product could generally receive AC input from the mains and convert it into a DC output at an embedded USB port. This includes products as varied as: laptops, desktop computers, TVs, power strips, surge protectors, refrigerators, lamps, or any other household consumer goods with USB output ports. DOE seeks feedback on the following topics related to consumer products with USB output ports:

Issue 1: How can a product that has a primary functionality other than power conversion but with an integrated USB output, be differentiated from a product of which power conversion is the primary function? For such products, is it possible to isolate the power conversion associated with the USB output and measure its efficiency independently from that of the remainder of the product?

[5] The USB Implementers Forum is an organization made up of industry stakeholders that support the advancement and adoption of USB technologies. For more information, visit *https://www.usb.org/about*

2. Wireless Power Devices

A wireless power device is one that transfers electrical energy from a power source to an electrical load without the use of physical conductors such as wires and cables. DOE has identified two types of wireless power devices, one of which appears to meet the definition of an EPS.

One group of wireless power devices, which includes chargers for electric toothbrushes, shavers, and smartwatches, consists of devices that operate by only powering battery charging circuits in an end-use product. These devices interface with the end-use product using proprietary charging connections that only work with products from the same manufacturer. However, only some of these devices are subject to the battery charger standards – namely, electric toothbrushes and water jets. These devices are collectively known as inductive chargers for wet environments. To date, all other applications of inductive battery charging fall under the dry environment terminology, for which DOE has not promulgated any standards.

The second group of wireless power devices consists of devices that can work with products that are equipped with or without batteries as well as with products from different manufacturers. These include products such as universal wireless mats that can be used with various consumer devices made by different manufacturers. In DOE's view, these devices could therefore be considered EPSs, but would not be Class A EPSs because they are not connected to the end-use product using a removable or hard-wired electrical connection, cable, cord, or other wiring. See 42 U.S.C. 6291(36)(C)(i)(V). Further, DOE is not aware of any wireless power device that can operate a consumer product that is not a battery charger without the assistance of

a battery – making them non-Class A indirect operation EPSs, a subset of products for which energy efficiency standards do not currently exist under DOE's regulations,. Accordingly, these products are not subject to the current EPS standards. DOE seeks public input on the following questions to help assess the necessity of regulating the energy efficiency of these devices:

Issue 2: How many varieties of wireless EPS products that can power a non-battery operated end-use product directly are currently offered for sale? What are the shipment volumes of these products and what are the projected sales in the industry over the next 5 years?

DOE requests feedback on what factors should be considered when evaluating product classes and standards for wireless EPSs such as wireless mats.

What are the design options associated with wireless EPSs that could be used to improve the efficiency of the power transfer process and what are the costs associated with each design option? What are the achievable efficiencies of wireless EPSs and is there a correlation between efficiency and output power such as in more traditional wired EPSs?

Issue 3: How can the efficiency of wireless power devices be measured and replicated in a lab setting to achieve repeatable results? Do any industry standards or test methods exist or are any being developed to test the energy efficiency or power consumption of wireless EPSs that DOE would consider adopting? If yes, what are the pros and cons of each? If no published industry testing standard exist, do stakeholders have any input regarding a method to test these products?

B. Market and Technology Assessment

The market and technology assessment that DOE routinely conducts when analyzing the impacts of a potential new or amended energy conservation standard provides information about the EPS industry that will be used in DOE's analysis throughout the rulemaking process. DOE uses qualitative and quantitative information to characterize the structure of the industry and market. DOE identifies manufacturers, estimates market shares and trends, addresses regulatory and non-regulatory initiatives intended to improve energy efficiency or reduce energy consumption, and explores the potential for efficiency improvements in the design and manufacturing of EPSs. DOE also reviews product literature, industry publications, and company websites. Additionally, DOE may conduct interviews with manufacturers to improve its assessment of the market and available technologies for EPSs.

1. Product Classes

When evaluating and establishing energy conservation standards, DOE may divide covered products into product classes by the type of energy used, or by capacity or other performance-related features that would justify a different standard from that which applies (or will apply) to other products within such type or class. (42 U.S.C. 6295(q)) In making a determination whether capacity or another performance-related feature justifies a different standard, DOE must consider such factors as the utility of the feature to the consumer and other factors DOE deems appropriate. (*Id.*)

For EPSs, the current energy conservation standards specified in 10 CFR 430.32 are based on 8 product classes determined according to the following performance-related features

that provide utility to the consumer, in terms of output voltage type, output voltage and current levels, number of simultaneous output voltage(s) and whether the product meets the definition of direct or indirect operation EPSs. Additionally, EPCA, as amended by EISA 2007, also prescribes the criteria for a subcategory of EPSs – those classified as Class A EPSs. 42 U.S.C 6291(36)(C)(i). Indirect operation EPSs falling within the Class A EPS definition are subject to Level IV standards while non-Class A indirect operation EPSs would not be subject to any standards. Direct operation EPSs are subject to Level VI standards regardless of whether they meet the Class A definition. 10 CFR 430.32. Table II.1 lists the level of standards applicable to different types of EPSs based on operation type and whether it meets the Class A definition.

Table II.1 Application of Standards for Class A/Non-Class A EPS Standard Levels Based on Type of Operation

	Class A EPS	**Non-Class A EPS**
Direct operation EPS	Level VI: 10 CFR 430.32(w)(1)(ii)	Level VI: 10 CFR 430.32(w)(1)(ii).
Indirect Operation EPS	Level IV: 10 CFR 430.32(w)(1)(i)	No Standards.

Table II.2 lists the current 8 product classes for EPSs and their respective product class codes for EPSs. A "low-voltage EPS" means an EPS with a nameplate output voltage less than 6 volts and nameplate output current greater than or equal to 550 milliamps. A "basic-voltage EPS" means an EPS that is not a low-voltage EPS. See 10 CFR 430.2.

Table II.2 Current EPS Product Classes

Product Class Code	**Product Class Description**
B	Direct Operation, AC-DC, Basic-Voltage.
C	Direct Operation, AC-DC, Low-Voltage (except those with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps

Product Class Code	Product Class Description
	that charge the battery of a product that is fully or primarily motor operated).
C-1	Direct Operation, AC-DC, Low-Voltage with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps and charges the battery of a product that is fully or primarily motor operated.
D	Direct Operation, AC-AC, Basic-Voltage.
E	Direct Operation, AC-AC, Low-Voltage.
X	Direct Operation, Multiple-Voltage.
H	Direct Operation, High-Power.
N	Indirect Operation.

Issue 4: DOE requests feedback on the current EPS product classes and whether these classes continue to reasonably depict the make-up of the EPS market or whether changes are merited. Related to this request, DOE seeks information on whether combining certain classes could impact product utility by eliminating any performance-related features or impact the stringency of the current energy conservation standard for these products. DOE also requests comment on separating any of the existing product classes and whether it would impact product utility by eliminating any performance-related features or reduce any compliance burdens.

Issue 5: Separate from the approach to combine product classes, DOE may also consider modifying the certification template to reduce the number of individual product codes by requesting additional information such as voltage rating and current rating which would then be used to assign the appropriate product class and identify the corresponding standard. DOE requests comment on this approach, or other approaches that achieve the same purpose.

DOE also understands that new configurations and features may be available for EPSs that may not have been available at the time of the last energy conservation standards analysis.

Issue 6: DOE seeks information regarding any other new product classes that are not already addressed by its current regulations that it should consider for inclusion in its analysis. Specifically, DOE requests information on the performance-related features (*e.g.*, improved switched-mode topologies, semiconductor materials, component designs *etc.*) that provide unique consumer utility and data detailing the corresponding impacts on energy use that would justify separate product classes (*i.e.*, explanation for why the presence of these performance-related features would increase energy consumption).

Issue 7: Has the distribution of the various EPS product classes that DOE regulates changed since DOE's analysis for the final rule published on February 10, 2014? In that prior analysis, DOE indicated that, for total EPS shipments in 2009, direct operation, AC-DC, basic-voltage and low-voltage EPSs combined constituted nearly 73 percent of shipments, indirect operation EPSs made up approximately 22 percent of shipments, and the remaining product classes (AC-AC EPSs, multiple-voltage EPSs, and high-power EPSs) made up 5 percent of shipments.[6]

[6] For additional details, see chapter 3 of the TSD for the February 2014 Final Rule. *https://www.regulations.gov/document?D=EERE-2008-BT-STD-0005-0217*

a. Direct Operation and Indirect Operation EPSs

The February 2014 Final Rule divided all EPSs into two categories, direct operation and indirect operation EPSs – with only direct operation EPSs being subject to the new Level VI standards that DOE adopted in that rule. That final rule also indicated that indirect operation EPSs that also met the definition of a Class A EPS would continue to be required to meet the already statutorily prescribed Level IV standards. The original intent of classifying all EPSs into these categories was to distinguish between EPSs that directly operate an end-use product, i.e., that can operate a consumer product that is not a battery charger without the assistance of a battery (direct operation EPSs), versus those devices that cannot operate a consumer product that is not a battery charger without the assistance of a battery (indirect operation EPSs). At the time of the February 2014 Final Rule's publication, DOE believed that it would be more effective to regulate indirect operation EPSs as part of the then-parallel battery charger rulemaking than to regulate them under the new and amended external power supply standards.

Since the publication of the February 2014 Final Rule, DOE has received many questions regarding EPSs that provide direct operation with one end-use product but may also be used to provide indirect operation with a different consumer product containing batteries and or a battery charging system. In the 2015 test procedure rule, DOE clarified that if an EPS can operate any consumer product directly, that product would be treated as a direct operation EPS. 80 FR 51434. Of particular importance are EPSs with common output plugs that can be used with products made by different manufacturers. An example of this scenario is an EPS with standard universal serial bus ("USB") connectors. These devices are often sold with end-use products containing batteries, such as a smartphone. Because these same EPSs are capable of directly

operating other end-use products that do not contain batteries (*e.g.*, small LED lamps, external speakers, etc.), they are not treated as indirect operation EPSs under DOE's regulations. DOE's analysis of the EPSs that are certified in the Compliance Certification Management System ("CCMS")[7] database further shows that only a small percentage are indirect operation EPSs. Specifically, of the 6,764 non-adaptive basic models of EPSs that are certified in the database, only 60 basic models are classified as indirect operation Class A and of which, a further 42 are able to meet both the Level IV and Level VI standards. DOE therefore seeks feedback on the practicality of continuing to categorize EPSs as direct operation and indirect operation and on the merit of continuing to have separate standards for each. Any potential alignment of the standards between direct and indirect operation EPSs would result in standards either as stringent or more stringent than the Level VI standards currently required for direct operation EPSs.[8] As is typically the case, DOE would also consider the economic justification and technological feasibility of a proposal based on such an approach.

DOE also requests feedback on whether the EPS standards could be expressed in alternate terms. For instance, DOE may consider removing the distinction between direct operation/indirect operation EPSs. DOE notes that other regulations for EPSs, including those in Canada[9] and the European Union,[10] do not distinguish between direct and indirect operation EPSs.

[7] U.S. Department of Energy. Energy Efficiency and Renewable Energy. Appliance and Equipment Standards Program. CCMS. Last accessed on July 18, 2019. *https://www.regulations.doe.gov/certification-data/CCMS-4-External_Power_Supplies_-_Other_Than_Switch-Selectable_and_Adaptive_Single-Voltage_External_Power_Supplies.html#q=Product_Group_s%3A%22External%20Power%20Supplies%20-%20Other%20Than%20Switch-Selectable%20and%20Adaptive%20Single-Voltage%20External%20Power%20Supplies%22*

[8] See 42 U.S.C 6295(o)(1), commonly referred to as the "anti-backsliding provision").

[9] *http://www.nrcan.gc.ca/energy/regulations-codes-standards/products/6909*

Based on these considerations, DOE requests feedback on the following questions:

As DOE considers whether to amend its current standards, is the distinction between direct and indirect operation EPSs necessary and/or helpful and do they continue to merit separate standards?

Issue 8: Would manufacturers and other stakeholders better understand their compliance obligations under the applicable standards if DOE removed this classification and provided revised definitions for EPSs that are subject to conservation standards that more clearly specified the characteristics of EPSs that would be subject to or exempt from future standards. New definitions for EPSs would not, however, exempt EPSs from the standards to which they are currently subject (i.e. Level IV and Level VI standards).

Issue 9: Whether DOE retains the definitions for direct operation EPS and indirect operation EPS or proposes new definitions to describe which EPSs are subject to standards, is there any ambiguity in these existing definitions that DOE should consider clarifying? For instance, how (if at all) should DOE clarify these definitions as it relates to specific applications for which EPSs are used?

[10] *http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009R0278&from=EN*

Issue 10: If DOE were to propose new definitions, what criteria or characteristics should DOE use to identify whether an EPS is either subject to or exempt from standards?

For the purposes of this document, DOE continues to refer to direct operation and indirect operation EPSs, as appropriate, in the following sections. These terms are used to discuss and seek feedback based on the existing regulation. DOE's decision regarding the continued use of these terms may be considered should DOE determine to proceed with a rulemaking.

b. Low-Voltage, High-Current External Power Supplies

In the February 2014 Final Rule, DOE separated direct operation low-voltage, AC-DC EPSs into two separate product classes and outlined two separate standards requirements. 79 FR 7866-7867. The first class is reserved for all direct operation EPSs with nameplate output voltages less than 6 volts and nameplate output currents greater than or equal to 550 milliamps. EPSs in this product class are subject to the Level VI standards.

The second class DOE created is a sub-set within this product class, generally referred to as "low-voltage, high-current EPSs." This class represents all EPSs with nameplate output voltages of less than 3 volts and nameplate output currents greater than or equal to 1000 milliamps that are designed to charge the battery of a product that is fully or primarily motor operated. EPSs in this product class are not subject to the Level VI standards. Since these low-voltage, high-current EPSs still meet the statutory definition of Class A EPSs, they remain

subject to the Level IV standards set by EISA. However, DOE did not apply the Level VI standards to these products over manufacturer concerns about the ability of these products to meet these higher efficiency levels. See 79 FR 7866-7867.

DOE intends to analyze potential efficiency levels for these low-voltage, high-current EPSs that are more stringent than the EISA Level IV standards. DOE plans to conduct a market assessment, energy use analysis, and third-party testing to develop a cost-efficiency relationship for low-voltage, high-current EPSs to determine whether any incremental improvements in energy efficiency are technologically feasible and economically justified. DOE is specifically interested in gathering particular information through this RFI on the following questions:

In the February 2014 Final Rule, DOE determined that the inherent design of a low-voltage high-current EPS limits its achievable efficiencies due to input rectification voltage drops relative to the output voltage, resistive losses in the higher current outputs, and the potential to decrease the utility of these products to improve efficiency by forcing manufacturers to utilize more expensive and larger components to meet the proposed standards. Is this justification for exempting "low-voltage, high-current" EPSs from the active mode efficiency requirements still valid?

Are there any products in the current market that would fall in the low-voltage high-current product class? If so, which types of products?

Issue 11: Are there any unique technology or design options associated with low-voltage, high-current EPSs? If so, what (if any) specific unique design considerations (*i.e.,* special topologies, additional component derating, etc.)

would be necessary in addressing potential energy efficiency improvements for these EPSs?

Issue 12: What are the specific limitations (if any) associated with the achievable efficiencies of low-voltage, high-current EPSs?

Issue 13: What technology options (if any) would allow low-voltage, high-current EPSs to improve their average active-mode efficiency? What specific costs (in dollars) are associated with these technology options and subsequent efficiency gains?

2. Technology Assessment

In analyzing the feasibility of potential new or amended energy conservation standards, DOE uses information about existing and past technology options and prototype designs to help identify technologies that manufacturers could use to meet and/or exceed a given set of energy conservation standards under consideration. In consultation with interested parties, DOE intends to develop a list of technologies to consider in its analysis. That analysis will likely include a number of the technology options DOE previously considered during its most recent rulemaking for EPSs. A complete list of those prior options appears in Table II.2. As certain technologies have progressed since the February 2014 Final Rule, Table II.3 lists newer technology options that DOE may also consider in a future EPS energy conservation standards rulemaking.

Table II.3 Technology Options for EPSs Considered in the Development of the February 2014 Final Rule

1	Improved Transformers

2	Switched-Mode Power Supplies
3	Low-Power Integrated Circuits
4	Schottky Diodes and Synchronous Rectification
5	Low-Loss Transistors
6	Resonant Switching
7	Resonant ("Lossless") Snubbers

Table II.4 New Technology Options for EPSs

1	Adaptive voltage modulation via digital communication
2	Wide Band Gap Semiconductors
3	Advanced Core Materials
4	Low Equivalent Series Resistance Capacitors
5	Litz Wire
6	Printed Circuit Boards with Higher Copper Content

DOE seeks information on the technologies listed in Table II.2 regarding their applicability to the current market and how these technologies may impact the efficiency of EPSs as measured according to the DOE test procedure. DOE also seeks information on how these technologies may have changed since they were considered in the February 2014 Final Rule analysis. Specifically, DOE seeks information on the range of efficiencies or performance characteristics that are currently available for each technology option.

DOE seeks information on the technologies listed in Table II.3 regarding their market adoption, costs, and any concerns with incorporating them into products (*e.g.*, impacts on consumer utility, potential safety concerns, manufacturing/production/implementation issues, *etc.*), particularly as to changes that may have occurred since the February 2014 Final Rule.

Issue 14: DOE seeks comment on other technology options that it should consider for inclusion in its analysis and if these technologies may impact product features or consumer utility.

C. Screening Analysis

The purpose of the screening analysis is to evaluate the technologies that improve

equipment efficiency to determine which technologies will be eliminated from further consideration and which will be included in the engineering analysis for further consideration.

DOE determines whether to eliminate certain technology options from further consideration based on the following criteria:

(1) *Technological feasibility.* Technologies that are not incorporated in commercial products or in working prototypes will not be considered further.

(2) *Practicability to manufacture, install, and service.* If it is determined that mass production of a technology in commercial products and reliable installation and servicing of the technology could not be achieved on the scale necessary to serve the relevant market at the time of the compliance date of the standard, then that technology will not be considered further.

(3) *Impacts on equipment utility or equipment availability.* If a technology is determined to have significant adverse impact on the utility of the equipment to significant subgroups of consumers, or result in the unavailability of any covered equipment type with performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as equipment generally available in the United States at the time, it will not be considered further.

(4) *Adverse impacts on health or safety.* If it is determined that a technology will have significant adverse impacts on health or safety, it will not be considered further.

10 CFR part 430, subpart C, appendix A, 6(c)(3) and 7(b).

Technology options identified in the technology assessment are evaluated against these criteria using DOE analyses and inputs from interested parties (e.g., manufacturers, trade organizations, and energy efficiency advocates). Technologies that pass through the screening analysis are referred to as "design options" in the engineering analysis. Technology options that fail to meet one or more of the four criteria are eliminated from consideration.

Additionally, DOE notes that the four screening criteria do not directly address the propriety status of technology options. DOE only considers potential efficiency levels achieved through the use of proprietary designs in the engineering analysis if they are not part of a unique pathway to achieve that efficiency level (*i.e.*, if there are other non-proprietary technologies capable of achieving the same efficiency level).

DOE did not screen out any technology options for EPSs, having considered the following four factors: (1) technological feasibility; (2) practicability to manufacture, install, and service; (3) adverse impacts on product utility to consumers; and (4) adverse impacts on health or safety. [11]

Issue 15: DOE requests feedback on what impact, if any, the four screening criteria described in this section would have on each of the technology options listed in Table II.2 and Table II.3 with respect to EPSs. Similarly, DOE seeks information regarding how these same criteria would affect any other

[11] For additional details, see chapter 4 of the technical support document ("TSD") for the February 2014 Final Rule. *https://www.regulations.gov/document?D=EERE-2008-BT-STD-0005-0217*

technology options not already identified in this document with respect to their potential use in EPSs.

D. Engineering Analysis

The engineering analysis estimates the cost-efficiency relationship of products at different levels of increased energy efficiency ("efficiency levels"). This relationship serves as the basis for the cost-benefit calculations for consumers, manufacturers, and the Nation. In determining the cost-efficiency relationship, DOE estimates the increase in manufacturer production cost ("MPC") associated with increasing the efficiency of products above the baseline, up to the maximum technologically feasible ("max-tech") efficiency level for each product class.

DOE historically has used the following three methodologies to generate incremental manufacturing costs and establish efficiency levels ("ELs") for analysis: (1) the design-option approach, which provides the incremental costs of adding to a baseline model various design options that will improve its efficiency; (2) the efficiency-level approach, which provides the relative costs of achieving increases in energy efficiency levels, without regard to the particular design options used to achieve such increases; and (3) the cost-assessment (or reverse engineering) approach, which provides "bottom-up" manufacturing cost assessments for achieving various levels of increased efficiency, based on detailed cost data for parts and material, labor, shipping/packaging, and investment for models that operate at particular efficiency levels.

1. Baseline Efficiency Levels

For each established product class, DOE selects a baseline model as a reference point against which any changes resulting from new or amended energy conservation standards can be measured. The baseline model in each product class represents the characteristics of common or typical products in that class. Typically, a baseline model is one that meets the current minimum energy conservation standards and provides basic consumer utility.

If it determines that a rulemaking is necessary, consistent with this analytical approach, DOE tentatively plans to consider the current minimum energy conservations standards that were required for compliance on February 10, 2016 as the baseline efficiency levels for each product class. The current standards for each product class are based on Active Mode Efficiency and No-load mode (standby mode) power consumption. The current standards for EPS are found at 10 CFR 430.32.

Issue 16: DOE requests feedback on whether using the current energy conservation standards for EPSs would be appropriate baseline efficiency levels for DOE to apply to each product class in evaluating whether to amend the current energy conservation standards for these products. DOE requests data and suggestions to evaluate the baseline efficiency levels in order to better evaluate whether to amend the energy conservation standards for these products.

Issue 17: DOE requests feedback on the appropriate baseline efficiency levels for any newly analyzed product classes that are not currently in place or

for the contemplated combined product classes, as discussed in section II.B.1 of this document. For newly analyzed product classes, DOE requests energy use data to develop a baseline relationship between energy efficiency and nameplate power ratings.

2. Maximum Available and Maximum Technologically Feasible Levels

As part of DOE's analysis, the maximum available efficiency level is determined by the highest efficiency unit currently available on the market. For the February 2014 Final Rule, DOE did not analyze all 4 EPS configurations and 8 product classes. Rather, DOE focused the analysis on three configurations of EPSs: direct operation EPSs, multiple-voltage and high-power EPSs, and indirect operation EPSs. For each configuration of EPS, DOE selected certain classes and units as "representative" and concentrated its analytical effort on these because they represent a significant majority of units and because analysis on these units and classes can be extended to all units and classes. For direct operation EPSs, DOE chose four representative units and scaled the analysis according to different nameplate power ratings. For multiple-voltage EPSs and high-power EPSs, DOE chose one representative unit for each class. DOE chose not to conduct an engineering analysis for indirect operation EPSs because DOE believed that the energy savings associated with these EPSs would be captured in a battery charger rulemaking. See 79 FR 57530 and chapter 5 of the preliminary analysis TSD for that rulemaking.[12] The current maximum available efficiencies for all product classes are included in Table II.5.

[12] See chapter 5 of the preliminary analysis TSD. *https://www.regulations.gov/document?D=EERE-2008-BT-STD-0005-0031*

Table II.5 Maximum Efficiency Levels Currently Available

Product Class	Best-in-market Efficiencies (%)
Direct Operation, AC-DC, Basic-Voltage.	93.02
Direct Operation, AC-DC, Low-Voltage (except those with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps that charge the battery of a product that is fully or primarily motor operated).	91.8
Direct Operation, AC-DC, Low-Voltage with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps and charges the battery of a product that is fully or primarily motor operated.	84.86
Direct Operation, AC-AC, Basic-Voltage.	90.96
Direct Operation, AC-AC, Low-Voltage.	87.58
Direct Operation, Multiple-Voltage.	91.18
Direct Operation, High-Power.	93.59
Indirect Operation.	88.5

DOE defines a max-tech efficiency level to represent the theoretical maximum possible efficiency if all available design options are incorporated in a model. In many cases, the max-tech efficiency level is not commercially available because it is not economically feasible. In the February 2014 Final Rule, DOE determined max-tech efficiency levels using energy modeling. These energy models were based on use of all design options applicable to the specific product classes. While these product configurations had not likely been tested as prototypes, all of the individual design options had been incorporated in available products.

DOE seeks input on whether the maximum available efficiency levels are appropriate and technologically feasible for potential consideration as possible energy conservation standards for the products at issue – and if not, why not. DOE also requests feedback on whether the maximum available efficiencies presented in Table II.5 are representative of those for the other EPS product classes not directly analyzed in the February 2014 Final Rule. If the range of

possible efficiencies is different for the other product classes not directly analyzed, what alternative approaches should DOE consider using for those product classes and why?

Issue 18: DOE seeks feedback on what design options would be incorporated at a max-tech efficiency level, and the efficiencies associated with those levels. As part of this request, DOE also seeks information as to whether there are limitations on the use of certain combinations of design options.

3. Manufacturer Production Costs and Manufacturing Selling Price

As described at the beginning of this section, the main outputs of the engineering analysis are cost-efficiency relationships that describe the estimated increases in manufacturer production cost associated with higher-efficiency products for the analyzed product classes. For the February 2014 Final Rule, DOE developed the cost-efficiency relationships by estimating the efficiency improvements and costs associated with incorporating specific design options into the assumed baseline model for each analyzed product class.

Issue 19: DOE requests feedback on how manufacturers would incorporate the technology options listed in Table II.2 and Table II.3 to increase energy efficiency in EPSs beyond the baseline. This includes information on the order in which manufacturers would incorporate the different technologies to incrementally improve the efficiencies of products. DOE also requests feedback on whether the increased energy efficiency would lead to other design changes that would not occur otherwise. DOE is also interested in

information regarding any potential impact of design options on a manufacturer's ability to incorporate additional functions or attributes in response to consumer demand.

Issue 20: DOE also seeks input on the increase in MPC associated with incorporating each particular design option. Specifically, DOE is interested in whether and how the estimated costs for the design options used in the February 2014 Final Rule have changed since the time of that analysis. DOE also requests information on the investments necessary to incorporate specific design options, including, but not limited to, costs related to new or modified tooling (if any), materials, engineering and development efforts to implement each design option, and manufacturing/production impacts.

Issue 21: DOE requests comment on whether certain design options may not be applicable to (or incompatible with) specific product classes.

As described in section II.D.2 of this document, in the February 2014 Final Rule, DOE concentrated its analytical efforts on certain representative product classes and extended the analysis to all other product classes. . DOE developed cost-efficiency curves for these product classes that were used as the input for the downstream analyses conducted in support of that rulemaking. See chapter 5 of the February 2014 Final Rule TSD for the cost-efficiency curves developed in that rulemaking.

Issue 22: DOE seeks feedback on whether the approach of analyzing a sub-set of product classes is appropriate for a future EPS energy conservation standards rulemaking. DOE requests comment on whether it is necessary to individually analyze all the other product classes established in the February 2014 Final Rule. For example, analysis of product classes with an AC output may not be necessary if the analysis performed for AC-DC product classes applies to both. Additionally, DOE seeks comment on whether the approach used to apply the analyzed product class results to the other product classes is appropriate – and if not, why not? For example, if it is necessary to individually analyze more than the one product class used in the February 2014 Final Rule, please provide information on why aggregating certain products is not appropriate. If this approach is not appropriate, what alternative approaches should DOE consider using as an alternative and why?

To account for manufacturers' non-production costs and profit margin, DOE applies a non-production cost multiplier (the manufacturer markup) to the MPC. The resulting manufacturer selling price ("MSP") is the price at which the manufacturer distributes a unit into commerce. For the February 2014 Final Rule, DOE used increasing manufacturer markups for successive efficiency levels at a given power output within a product class. See Tables IV-5 through IV-10 in the February 2014 Final Rule for a complete list of all mark-ups used.

Issue 23: DOE requests feedback on whether the various manufacturer markups used in the February 2014 Final Rule are still appropriate and applicable.

E. Distribution Channels

In generating end-user price inputs for the life-cycle cost ("LCC") analysis and national impact analysis ("NIA"), DOE must identify distribution channels (*i.e.*, how the products are distributed from the manufacturer to the consumer), and estimate relative sales volumes through each channel.

Issue 24: DOE requests information on the existence of any distribution channels, other than the retail outlet distribution channel, that are used to distribute the products at issue into the market.

Issue 25: Do the distribution channels and markups identified in DOE's analysis for the final rule published in February 10, 2014, still apply to the current EPS market? If not, what adjustments (if any) would be needed to account for the current EPS market? In this regard, DOE also seeks any supporting data that would help in making these adjustments to its analyses.

F. Energy Use Analysis

As part of the rulemaking process, DOE conducts an energy use analysis to identify how products are used by consumers, and thereby determine the energy savings potential of energy

efficiency improvements. DOE bases the energy consumption of EPSs on the rated annual energy consumption as determined by the DOE test procedure. Along similar lines, the energy use analysis is meant to represent typical energy consumption in the field.

1. Active-Mode and No-Load Mode of External Power Supplies

DOE will review existing industry, international, and voluntary standards to assist in its analysis of whether (and how, as appropriate) to amend the current active-mode and no-load mode efficiency standards for EPSs. Current mandatory standards programs for EPSs include the European Union ("EU") Code of Conduct, Version 4, the Level IV Congressional standards; the Tier 1 EPS standards established by National Resources Canada ("NRCan"); and DOE's Level VI efficiency standards. DOE will also consider such voluntary standards programs as the EU Code of Conduct, Version 5 ("Code of Conduct v5")[13] when analyzing the impacts of more stringent standards on manufacturers and consumers. All of these standards-setting programs use active-mode and no-load mode metrics similar to DOE's EPS standards to regulate the energy efficiency and power consumption of EPSs.

DOE defines "active-mode" as the mode of operation when the EPS is connected to the main electricity supply and the output is connected to a load. See section 2.a of Appendix Z. In this mode, EPS efficiency is the conversion efficiency from the mains (*i.e.*, the electrical outlet) to the end-use load when the load draws some or all of the maximum rated output power of the EPS. DOE averages the active-mode efficiency at four loading conditions—25, 50, 75, and 100

[13] European Union: Code of Conduct on External Power Supplies Version 5 (available at *http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/files/documents/ICT_CoC/code_of_conduct_for_eps_version_5_-_final.pdf*

percent of maximum rated output current—to assess the performance of an EPS when powering diverse loads.

Unlike active-mode efficiency, however, no-load mode is characterized by power consumption rather than conversion efficiency. This is because the EPS does not deliver power to the end use load in this mode. DOE defines "no-load mode" as the mode of operation where the EPS is connected to the main electricity supply and the output is not connected to a load. See 10 CFR part 430, Subpart B, Appendix Z, section 2.q. The EPS test procedure measures the no-load performance of a given EPS at 0 percent of the maximum rated output current where the power consumed by the EPS is that drawn from the mains with all loads, either electronic or resistive, physically and electrically disconnected from the output of the EPS.

The Level IV and Level VI standards both use average active-mode efficiency, calculated as a percentage, to regulate the active-mode of EPSs and no-load power consumption, in watts, to regulate the standby mode of EPSs. DOE analyzed the CCMS database and sorted the product reports based on the compliance characteristics of Level VI EPSs. Of the models DOE could accurately categorize using the manufacturer-submitted output power and current data, more than 38% surpassed the minimum average active-mode efficiency standard by at least 2 percentage points (*i.e.*, more than 38% of models were more efficient than required by the standard by at least 2 percentage points). Similarly, DOE identified over 7,700 models from NRCan's EPS database[14] that met or surpassed the Level VI standards, including 3,100 models that exceeded

[14] Natural Resources Canada. Energy Efficiency Ratings: Search. Last Accessed on January 20, 2017. *<http://oee.nrcan.gc.ca/pml-lmp/index.cfm?language_langue=en&action=app%2Esearch%2Drecherche&appliance=EPS >*

the minimum average active-mode efficiency standard by at least 2 percentage points. The majority of these efficiency increases were seen in EPSs with nameplate output powers greater than 49 watts, which may indicate that these types of EPSs are capable of achieving even higher average active-mode efficiencies than the minimum efficiency standards prescribed by DOE's Level VI standards.

Other efficiency programs have recognized the potential efficiency gains for these types of EPSs as well and have established energy efficiency guidelines more stringent than the standards developed by DOE. For instance, the EU's Code of Conduct v5 lays out the foundation for a set of voluntary guidelines for individual manufacturers to meet and includes specifications regarding EPS coverage, energy efficiency, and monitoring provisions. The Code of Conduct v5 measures the active-mode efficiency of an EPS at the same loading conditions as DOE's standards program and also includes a no-load power consumption metric at 0 percent load. Also like DOE's efficiency standards, the Code of Conduct v5's prescribed energy efficiency levels at the specified five loading points rely on equations that generate a minimum average active-mode efficiency requirement as a function of nameplate output power of an EPS. The energy efficiency provisions are divided into two groupings—Tier 1 and Tier 2. These tiers delineate two separate sets of voluntary energy efficiency guidelines with two unique effective dates. Tier 1 went into effect in January 2014, and the more stringent guidelines in Tier 2 in January 2016. These tiers sort the applicable efficiency guidelines for EPSs based on the type of power conversion and the nameplate output voltage in an identical manner to DOE's own direct operation product classes. However, the Code of Conduct v5 provisions do not address some of the products addressed by DOE's direct operation standards, such as EPSs with nameplate output

powers greater than 250 watts and EPSs that output more than one voltage simultaneously. Instead, Code of Conduct v5 outlines unique efficiency standards for low-voltage[15] EPSs and EPSs that are not low-voltage.

While the Code of Conduct v5 efficiency program is voluntary, an assessment published in 2014 by the European Council for an Energy Efficient Economy ("ECEEE") analyzed the benefits and burdens of harmonizing the EU Ecodesign Directive standards for EPSs[16] with both mandatory and voluntary international regulations. The Ecodesign Directive outlines mandatory energy consumption and energy efficiency standards for consumer and commercial products in the EU, and revises those standards based on their Ecodesign Working Plan.[17] The study concluded that any revised standards for EPSs in the EU should harmonize with DOE's Level VI standards while making the Code of Conduct v5's Tier 2 standards mandatory at a later date, and that failing to harmonize with, at the minimum, Level VI standards would risk having poorer efficiency products circulating through the EU that cannot be sold in the U.S. Currently, EPSs are regulated as part of the Ecodesign Directive under Commission Regulation ("EC") No. 278/2009,[18] but an April 2015 working document[19] proposed to harmonize the EU standards for EPSs with DOE's Level VI requirements by January 2017 and implement standards equivalent to those found in Tier 2 of the Code of Conduct by January 2018. While this document was later

[15] The EU Code of Conduct on External Power Supplies considers a low-voltage EPS to be any EPS with a nameplate output voltage of less than 6 volts and a nameplate output current greater than or equal to 550 milliamps.
[16] Additional Assessment in the Frame of the Review Study on Commission Regulation (EC) No. 278/2009 External Power Supplies. March 2014. Final Report. <*http://www.eceee.org/static/media/uploads/site-2/ecodesign/products/battery-chargers/eps-review-additional-assessment-up-dated-final-report.pdf*>
[17] Ecodesign and Labeling. ErP Working Plan. <*http://www.eceee.org/ecodesign/Horizontal-matters/working-plan/*>
[18] Commission Regulation (EC) No. 278/2009 of April 6 2009. <*http://www.eceee.org/static/media/uploads/site-2/ecodesign/products/battery-chargers/finalreg-eps.pdf*>
[19] Ecodesign and Labeling. 278/2009: Battery chargers and external power supplies. <*http://www.eceee.org/ecodesign/products/battery-chargers/*>

revised to propose harmonization with DOE's Level VI standards by April 2020 and abandon pursuit of Tier 2 standards altogether, DOE found that more than 73% of the entries in its own CCMS database met or surpassed the Tier 2 standards initially proposed in the Code of Conduct v5 as did 67% of the units in the NRCan database. Therefore, DOE intends to analyze the impact of the Tier 2 standards on the EPS market for products sold in the U.S. and countries within the EU to determine whether more stringent efficiency standards in the U.S. are appropriate for EPSs. DOE welcomes feedback on its proposed approach to re-examine the minimum federal requirements for both the active-mode and no-load mode for all EPSs subject to the Level VI standards. Additionally, DOE seeks feedback from interested parties on the following questions:

Issue 26: What impact (if any) does the EU Code of Conduct v5 currently have on the EPS industry in the United States? If the effects are currently negligible, will the Code of Conduct v5 standards be likely to have an effect in the future? If so, what are those impacts likely to be and how long would it take for those impacts to impact the U.S. market?

Issue 27: Is active mode still the most energy consumptive state of operation for EPSs? If so, why? If not, why not?

Issue 28: Are there any specific types of EPSs for which it would be difficult to meet standards more stringent than the existing Level VI standards? If so, would it be difficult to meet the more stringent standards for average active mode efficiency, no-load mode power, or both? Which specific types of EPSs will find it difficult to meet more stringent standards and why?

Issue 29: Are there any specific types of EPSs for which increasing the efficiency requirement would impact the utility to consumers? If so, which types of EPSs will be impacted and how?

Issue 30: What design options exist for improving the efficiency of EPSs beyond the Level VI standard levels? Are any of the options proprietary – and if so, which ones?

Issue 31: Can manufacturers comply with the originally proposed Tier 2 Ecodesign requirements? If not, what are the technical and production barriers that would prevent manufacturers from meeting those proposed requirements? Will certain types of EPSs be likely to have greater difficulty in meeting these proposed requirements compared to other EPSs? If so, which types and why?

Issue 32: What are the costs (in dollars) associated with each of the design options utilized to implement efficiencies greater than the Level VI standards? Are there any currently available features that would likely be sacrificed if standards were made more stringent than Level VI?

Issue 33: Does the current average active-mode efficiency metric capture appropriately representative loading points for EPSs? If not, should DOE consider other loading points in active mode? If so, which ones and why?

Issue 34: What impact would alternate loading points have on any determination of active mode efficiency for EPSs? Should different loading points be weighted differently from others based on usage when considering overall energy consumption? If not, why not? If so, how?

Issue 35: Can EPSs achieve lower no-load values than those described in the Level VI standard? If not, why not? If so, how?

Issue 36: The EU Code of Conduct v5 Tier 2 levels for no-load mode are much more stringent than DOE's no-load requirements in the Level VI standard. What technical difficulties (if any) are there in meeting the EU Code of Conduct v5 Tier 2 levels for the no-load mode condition? What barriers (if any) do manufacturers face meeting or exceeding the EU Code of Conduct v5 Tier 2 levels for no-load mode?

2. Idle Mode and Sleep Mode of External Power Supplies

As part of its review and evaluation that led to the Level VI standards, DOE analyzed the energy usage profiles of a number of different EPSs based on the end-use application. These usage profiles considered a number of different modes such as active mode, idle/standby mode, sleep mode, no-load mode, and unplugged mode and then assigned specific daily percentages to each mode based on the expected operation. DOE used these weightings to calculate the overall energy impact of more stringent standards because the loading conditions used to determine the average active-mode efficiency metric for EPSs are most often associated with the operating mode of the consumer products they power.[20] While DOE evaluated the energy impacts of all operating modes, the Level VI standards do not account for any loading points below those specified in the average active mode efficiency metric (*i.e.*, 25, 50, 75 and 100 percent of the nameplate output current of the EPS). DOE has been made aware that several consumer products may operate at lower loading conditions in standby or idle/standby modes.

[20] See Chapter 7 and Appendix 7A of the TSD for further details. *https://www.regulations.gov/document?D=EERE-2008-BT-STD-0005-0217*

Issue 37: Do EPSs spend a significant portion of time operating at loading conditions outside the range currently considered by the EPS standards? If so, which ones?

Issue 38: What are the design options associated with improving low-load efficiency? Are any of the design options proprietary? What are the associated costs (in dollars) with implementing such options?

Issue 39: What EPS loading points would best represent idle mode, sleep mode, or other low-power loading conditions associated with consumer products in a low-power state? For each loading point, please explain why it would be best for the applicable mode.

Issue 40: Would improving low-load conversion efficiency result in any significant energy reduction over the lifetime of an EPS? If so, would these anticipated reductions be limited to those EPSs that are paired with particular types of associated end-use products – and if this is the case, which ones and why?

Issue 41: What impact would lower loading points have on any determination of average efficiency for EPSs – and why? Should different loading points be weighted differently from others based on usage when considering overall energy consumption – if so, why? And if not, why not?

Issue 42: If DOE were to consider including additional loading conditions into its test procedure, should they be integrated into DOE's standards – and if

so, how? Should the active mode efficiencies at the additional loading conditions be included in the calculation for the overall average active mode efficiency of a unit? If so, what impact (if any) would the additional active mode efficiencies have on overall efficiency ratings? If not, should DOE consider using a separate efficiency metric for low-loading points? Is there another approach that may be more appropriate for considering standby or idle mode energy savings?

Issue 43: Are there any additional resources concerning the operation of EPSs during idle or standby mode that DOE should consider when evaluating the EPS standards?

Issue 44: How has the typical usage of EPSs changed, if at all, since the Level VI standards became required, among the various modes of operation (e.g. no-load, maintenance, active)? If the EPS usage has changed, what is the nature of those usage pattern changes and what are the technical reasons as to why those usage patterns have changed in that manner?

G. Shipments

DOE develops shipments forecasts of EPSs to calculate the national impacts of potential amended energy conservation standards on energy consumption, net present value ("NPV"), and future manufacturer cash flows. DOE shipments projections are based on available historical data broken out by product class, capacity, and efficiency. Current sales estimates allow for a more accurate model that captures recent trends in the market.

Issue 45: DOE requests 2018 annual sales data (*i.e.*, number of shipments) for EPSs and product classes. If disaggregated fractions of annual sales are not available at the EPS class level, DOE requests more aggregated fractions of annual sales at the EPS category level. DOE also requests data and reports on future market shipment trends.

If disaggregated fractions of annual sales are not available at the product type level, DOE requests more aggregated fractions of annual sales at the category level.

Issue 46: If available, DOE requests the same annual sales information of the various classes of EPSs for the five years prior to 2019 (i.e. 2014-2018).

Issue 47: What are the potential impacts (if any) on EPS shipments if the current energy conservation standards for EPSs were to be amended to become more stringent?

Issue 48: Since compliance requirements with the Level VI standards began in 2016, what is the percentage of shipments in each product class at different efficiencies in the EPS market? In the absence of any further amendments to the current energy conservation standards, what are the current projected market trends (if any) in EPS efficiency and why? If the current standards were to be amended in a manner consistent with one of the approaches described elsewhere in this document (e.g. increased stringency, combining of

current classes, etc.), what impact(s) (if any) would be likely to occur in response?

H. Manufacturer Impact Analysis

The purpose of the manufacturer impact analysis ("MIA") is to estimate the financial impact of amended energy conservation standards on EPS manufacturers, and to evaluate the potential impact of such standards on direct employment and manufacturing capacity. The MIA includes both quantitative and qualitative aspects. The quantitative part of the MIA primarily relies on the Government Regulatory Impact Model ("GRIM"), an industry cash-flow model adapted for each product in this analysis, with the key output of industry net present value ("INPV"). The qualitative part of the MIA addresses the potential impacts of energy conservation standards on manufacturing capacity and industry competition, as well as factors such as product characteristics, impacts on particular subgroups of firms, and important market and product trends.

As part of the MIA, DOE intends to analyze impacts of amended energy conservation standards on subgroups of manufacturers of covered products, including small business manufacturers. DOE uses the Small Business Administration's ("SBA") small business size standards to determine whether manufacturers qualify as small businesses, which are listed by the applicable North American Industry Classification System ("NAICS") code.[21] Manufacturing of consumer EPS is classified under NAICS 335999, "All Other Miscellaneous

[21] Available online at *https://www.sba.gov/document/support--table-size-standards*.

Electrical Equipment and Component Manufacturing," and the SBA sets a threshold of 1500 employees or less for a domestic entity to be considered as a small business. This employee threshold includes all employees in a business' parent company and any other subsidiaries.

One aspect of assessing manufacturer burden involves examining the cumulative impact of multiple DOE standards and the product-specific regulatory actions of other Federal agencies that affect the manufacturers of a covered product or equipment. While any one regulation may not impose a significant burden on manufacturers, the combined effects of several existing or impending regulations may have serious consequences for some manufacturers, groups of manufacturers, or an entire industry. Assessing the impact of a single regulation may overlook this cumulative regulatory burden. In addition to energy conservation standards, other regulations can significantly affect manufacturers' financial operations. Multiple regulations affecting the same manufacturer can strain profits and lead companies to abandon product lines or markets with lower than expected future returns than competing products. For these reasons, DOE conducts an analysis of cumulative regulatory burden as part of its rulemakings pertaining to appliance efficiency.

Issue 49: To the extent feasible, DOE seeks the names and contact information of any domestic or foreign-based manufacturers that distribute EPSs in the United States.

Issue 50: DOE identified small businesses as a subgroup of manufacturers that could be disproportionally impacted by amended energy conservation

standards. In the manufacturer impact analysis for the February 2014 Final Rule, DOE did not identify any small business manufacturers of EPSs. DOE also did not identify any domestic manufacturers of EPSs (*i.e.*, DOE found that all residential EPSs sold in the U.S. were imported).[22] If the previous determinations are no longer valid, DOE requests the names and contact information of small business manufacturers, as defined by the SBA's size threshold, of EPSs that distribute products in the United States. In addition, DOE requests comment on any other manufacturer subgroups that could be disproportionally impacted by amended energy conservation standards. DOE requests feedback on any potential approaches that could be considered to address impacts on manufacturers, including small businesses.

Issue 51: DOE requests information regarding the cumulative regulatory burden impacts on manufacturers of EPSs associated with (1) other DOE standards applying to different products that these manufacturers may also make and (2) product-specific regulatory actions of other Federal agencies. DOE also requests comment on its methodology for computing cumulative regulatory burden and whether there are any flexibilities it can consider that would reduce this burden while remaining consistent with the requirements of EPCA.

[22] See chapter 12 of the TSD for the February 2014 Final Rule. *https://www.regulations.gov/document?D=EERE-2008-BT-STD-0005-0217*

Issue 52: Are there any additional maintenance or repair costs (in dollars), or differences in product lifetime, associated with EPSs at efficiencies higher than the Level VI standards? If so, what are they and what is the magnitude of those costs – both on a total basis and by application. If such costs exist, how do they compare with respect to the same types of costs for EPSs that were manufactured that did not meet the Level VI standards? With respect to any impacts on product lifetime, what is the extent of those impacts in light of the Level VI requirements – i.e. have they increased, decreased, or stayed constant?

I. Other Energy Conservation Standards Topics

1. Market Failures

In the field of economics, a market failure is a situation in which the market outcome does not maximize societal welfare. Such an outcome would result in unrealized potential welfare. DOE welcomes comment on any aspect of market failures, especially those in the context of amended energy conservation standards for EPSs such as a lack, or excess of information which leads to misinformed purchases, misaligned incentives between purchasers and users, and negative effects on external factors related to public health, environmental protection, or energy security.

2. Network / "Smart" Technology

DOE published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018). In that RFI, DOE sought information to better

understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE's intent in issuing the RFI was to ensure that the Department did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. DOE seeks comments, data and information on the issues presented in the RFI as they may be applicable to energy conservation standards for EPSs.

3. Other Issues

Additionally, DOE welcomes comments on other issues relevant to the conduct of its assessment in determining whether to amend the current EPS energy conservation standards that may not have been specifically identified in this document. In particular, DOE notes that under Executive Order 13771, "Reducing Regulation and Controlling Regulatory Costs," Executive Branch agencies such as DOE are directed to manage the costs associated with the imposition of expenditures required to comply with Federal regulations. See 82 FR 9339 (February 3, 2017). Consistent with that Executive Order, DOE encourages the public to provide input on measures DOE could take to lower the cost of its energy conservation standards rulemakings, recordkeeping and reporting requirements, and compliance and certification requirements applicable to EPSs while remaining consistent with the requirements of EPCA.

III. Submission of Comments

DOE invites all interested parties to submit in writing by the date specified previously in the **DATES** section of this document, comments and information on matters addressed in this notice and on other matters relevant to DOE's consideration of amended energy conservation standards for EPSs. After the close of the comment period, DOE will review the public

comments received and may begin collecting data, conducting the analyses discussed in this document.

Submitting comments via *http://www.regulations.gov*. The *http://www.regulations.gov* web page requires you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies Office staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *http://www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (CBI)). Comments submitted through *http://www.regulations.gov* cannot be claimed as CBI. Comments received through the website

will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *http://www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that www.regulations.gov provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to *http://www.regulations.gov*. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No facsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked "non-confidential"a with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

DOE considers public participation to be a very important part of the process for developing energy conservations standards for consumer products. DOE actively encourages the participation and interaction of the public during the comment period in each stage of the rulemaking process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE in the rulemaking process. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this rulemaking should contact Appliance and Equipment Standards Program at (202) 287-1445, or via e-mail at *ApplianceStandardsQuestions@ee.doe.gov.*

Signing Authority

This document of the Department of Energy was signed on April 2, 2020, by Alexander N. Fitzsimmons, Deputy Assistant Secretary for Energy Efficiency, Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on May 6, 2020

_____

Treena V. Garrett
Federal Register Liaison Officer,
U.S. Department of Energy

[FR Doc. 2020-09988 Filed: 5/19/2020 8:45 am; Publication Date: 5/20/2020]