DEPARTMENT OF ENERGY

10 CFR Part 430

[EERE-2023-BT-STD-0005]

RIN 1904-AF51

Energy Conservation Program: Energy Conservation Standards for Fluorescent Lamp Ballasts

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 fluorescent lamp ballasts ("FLB"). Under the Energy Policy and Conservation Act, as amended, DOE must review these standards no later than three years after making a determination that standards for the product do not need to be amended and publish either a notice of proposed rulemaking ("NOPR") to propose new standards for FLB or a notification of determination that the existing standards do not need to be amended. DOE is soliciting the public for information to help determine whether the current standards require amending under the applicable statutory criteria. DOE welcomes written comments from the public on any subject within the scope of this document, including topics not specifically raised.

DATES: Written comments and information are requested and will be accepted on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov* under docket number EERE-2023-BT-STD-0005. Follow the instructions for submitting comments. Alternatively, interested persons

may submit comments may submit comments, identified by docket number EERE-2023-BT-STD-0005, by any of the following methods:

Email: *FLB2023STD0005@ee.doe.gov*. Include the docket number EERE-2023-BT-STD-0005 in the subject line of the message.

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.

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. Telephone: (202) 287-1445.

No telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this 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 *www.regulations.gov*. All documents in the docket are listed in the *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 webpage can be found at *www.regulations.gov/docket/EERE-2023-BT-STD-0005*. The docket webpage 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 *www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT:

Mr. Bryan Berringer, 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) 586-0371. Email: *ApplianceStandardsQuestions@ee.doe.gov*.

Mr. Nolan Brickwood, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-4498. Email: *Nolan.Brickwood@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) 287-1445 or by email: *ApplianceStandardsQuestions@ee.doe.gov*.

SUPPLEMENTARY INFORMATION:

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I. Introduction

A. Authority and Background

The Energy Policy and Conservation Act, Pub. L. 94-163, 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 of EPCA[2] established the Energy Conservation Program for Consumer Products Other Than Automobiles. These products include fluorescent lamp ballasts ("FLBs"), the subject of this document. (42 U.S.C. 6292(a)(13)) EPCA prescribed energy conservation standards for these products and directed DOE to conduct two cycles of rulemakings to determine whether to amend these standards. (42 U.S.C. 6295(g)(7)(A)-(B))

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).

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. (42 U.S.C. 6297(d))

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

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[1] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Pub. L. 116-260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A-1 of EPCA.

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

each type of covered product, including those at issue here, and publish either a notification 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)) If DOE determines not to amend a standard based on the statutory criteria, not later than 3 years after the issuance of a final determination not to amend standards, DOE must publish either a notification of determination that standards for the product do not need to be amended, or a NOPR including new proposed 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))

DOE completed the first of the two statutorily-required rulemaking cycles in 2000 by publishing amended performance standards for FLBs manufactured on or after April 1, 2005. 65 FR 56740 (September 19, 2000) (Setting amended standards to apply starting on April 1, 2005.) On October 18, 2005, DOE published a final rule codifying the new FLB standards established in the Energy Policy Act of 2005 ("EPACT 2005") section 135(c)(2) into the CFR at 10 CFR 430.32(m). 70 FR 60407. Additionally, DOE completed a second rulemaking cycle to amend the standards for FLBs by publishing a final rule in 2011. 76 FR 70548 (November 14, 2011). DOE completed a third rulemaking cycle for FLBs by publishing a final determination to not amend standards in 2020 ("December 2020 Final Determination"). 85 FR 81558 (December 16, 2020). The current energy conservation standards are located in title 10 of the Code of Federal Regulations ("CFR") part 430, section 32(m). The currently applicable DOE test procedures for FLBs appear at 10 CFR part 430, subpart B, appendix Q.

DOE is publishing this RFI to collect data and information to inform its decision of whether to amend standards for FLBs consistent with its obligations under EPCA.

B. Deviation from Appendix A

In accordance with section 3(a) of 10 CFR part 430, subpart C, appendix A ("appendix A"), DOE notes that it is deviating from the provision in appendix A regarding the pre-NOPR stages for an energy conservation standards rulemaking. Section 6(d)(2) of appendix A states that the public comment period for pre-NOPR rulemaking documents will vary depending upon the circumstances of the particular rulemaking but will not be less than 75 calendar days. However, DOE finds it appropriate to deviate from this provision by specifying a public comment period of 30 days for this RFI. As noted, the December 2020 Final Determination was published on December 16, 2020. 85 FR 81558. The methodologies and information upon which DOE seeks comment in this RFI are based on the analysis conducted for the December 2020 Final Determination. Because stakeholders are familiar with the subjects covered in this RFI through the December 2020 Final Determination, and are therefore not reviewing new information, DOE has determined that 30 days is an appropriate period for providing comments.

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 FLBs may be warranted.

DOE must follow specific statutory criteria for prescribing new or amended standards for covered products. Under EPCA, DOE may not adopt any standard that would not result in the significant conservation of energy. (42 U.S.C. 6295(o)(3)(B)) Furthermore, EPCA requires that any new or amended energy conservation standard prescribed by the Secretary of Energy ("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 DOE 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;

(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 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[3] ● Regulatory Impact Analysis

As detailed throughout this RFI, DOE is publishing this document seeking 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 FLBs.

[3] On March 16, 2022, the Fifth Circuit Court of Appeals (No. 22-30087) granted the federal government's emergency motion for stay pending appeal of the February 11, 2022, preliminary injunction issued in *Louisiana v. Biden*, No. 21-cv-1074-JDC-KK (W.D. La.). As a result of the Fifth Circuit's order, the preliminary injunction is no longer in effect, pending resolution of the federal government's appeal of that injunction or a further court order. Among other things, the preliminary injunction enjoined the defendants in that case from "adopting, employing, treating as binding, or relying upon" the interim estimates of the social cost of greenhouse gases—which were issued by the Interagency Working Group on the Social Cost of Greenhouse Gases on February 26, 2021—to monetize the benefits of reducing greenhouse gas emissions. In the absence of further intervening court orders, DOE has reverted to its approach prior to the injunction and present monetized benefits where appropriate and permissible by law.

A. Products Covered by This Process

This RFI covers those products that meet the definitions of a FLB, as codified at 10 CFR 430.2. Fluorescent lamp ballast is defined as a device which is used to start and operate fluorescent lamps by providing a starting voltage and current and limiting the current during normal operation. (10 CFR 430.2; 42 U.S.C. 6291(29)(A))

The following FLBs are exempt from standards: (1) A dimming ballast designed and marketed to operate exclusively lamp types other than one F34T12, two F34T12, two F96T12/ES, or two F96T12HO/ES lamps; (2) a low-frequency ballast that is designed and marketed to operate T8 diameter lamps, is designed and marketed for use in electromagnetic interference-sensitive-environments only, and is shipped by the manufacturer in packages containing 10 or fewer ballasts; and (3) a programmed start ("PS") ballast that operates 4-foot medium bipin ("MBP") T8 lamps and delivers on average less than 140 milliamps ("mA") to each lamp. 10 CFR 430.32(m)(3). Of these exemptions, in the December 2020 Final Determination, DOE included in the analysis all FLBs that are dimmable and PS ballasts operating 4-foot MBP T8 lamps and using less than 140 mA (*i.e.,* low-current PS ballasts). Regarding the inclusion of dimming ballasts, DOE determined that that standards for dimming ballasts could potentially result in energy savings. Regarding the inclusion of low-current PS ballasts, DOE determined in the December 2020 Final Determination that alternative options such as using PS ballasts with operating current at 140 mA or higher, paired with reduced-wattage lamps or decreasing the number of lamps in the system, could provide low light output levels comparable to those attained using low-current PS ballasts and therefore included low-current PS ballasts in the analysis. 85 FR 81558, 81564-81565.

DOE requests feedback on whether establishing standards for any groups of FLBs not currently subject to standards could result in significant energy savings.

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 FLBs 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 FLBs. DOE also reviews product literature, industry publications, and company websites. Additionally, DOE considers conducting interviews with manufacturers to improve its assessment of the market and available technologies for FLBs.

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 justify a different standard. (42 U.S.C. 6295(q)(1)) 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 FLBs, the current energy conservation standards specified in 10 CFR 430.32(m) are based on 7 product classes listed in Table II.1.

Table II.1 Current Fluorescent Lamp Ballasts Product Classes

Product Class	
IS/RS Commercial	Instant start ("IS") and rapid start ("RS") ballasts (not classified as residential) that operate: 4-foot medium bipin lamps 2-foot U-shaped lamps 8-foot slimline lamps

Product Class	
PS Commercial	Programmed start ballasts (not classified as residential) (*i.e.,* commercial)that operate: 4-foot medium bipin lamps 2-foot U-shaped lamps 4-foot miniature bipin standard output lamps 4-foot miniature bipin high output lamps
IS/RS 8-foot HO	Instant start and rapid start ballasts (not classified as sign ballasts) that operate 8-foot high output lamps
PS 8-foot HO	Programmed start ballasts (not classified as sign ballasts) that operate 8-foot high output lamps
Sign	Sign ballasts that operate 8-foot high output lamps
IS/RS Residential	Instant start and rapid start residential ballasts that operate: 4-foot medium bipin lamps 2-foot U-shaped lamps 8-foot slimline lamps
PS Residential	Programmed start residential ballasts that operate: 4-foot medium bipin lamps 2-foot U-shaped lamps

DOE requests feedback on the current FLB product classes, whether changes to these individual product classes and their descriptions should be made, and whether certain classes should be merged or separated.

In the December 2020 Final Determination, DOE analyzed new lamp types in existing product classes based on a review of the latest product offerings on the market. DOE added 4-foot miniature bipin ("MiniBP") standard output ("SO") and 4-foot MiniBP high output ("HO") lamp types to the instant start ("IS")/rapid start ("RS") commercial (not classified as residential), IS/RS residential, and PS residential product classes. 85 FR 81558, 81564-81565. For the dimming product class, DOE identified 4-foot MBP, 4-foot MiniBP SO, 4-foot MiniBP HO, and 2-foot U-shaped as lamp types operated by dimming ballasts. 85 FR 81558, 81566.

DOE requests feedback on whether it should include additional lamp types in any of the current product classes.

As noted in section II.A in the December 2020 Final Determination, DOE included dimming ballasts in its analysis. In the December 2020 Final Determination DOE also evaluated dimming ballasts as a separate product class in order to account for the added circuitry in dimming ballasts that make them less efficient than comparable standard ballasts. DOE also based the analysis on measuring the ballasts luminous efficiency ("BLE") at full light output for all ballasts, including dimming ballasts. 85 FR 81558, 81564-81565.

DOE seeks information regarding any other new product classes it should consider for inclusion in its analysis. Specifically, DOE requests information on performance-related features 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).

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 in the December 2020 Final Determination. 85 FR 81558, 81566. A complete list of those prior options appears in Table II.2.

Table II.2 Technology Options for FLB Considered in the Development of the December 2020 Final Determination

Technology Option		Description
Electronic Ballast		Use an Electronic Ballast Design.
Improved Components	Transformers/Inductors	Use litz wire to reduce winding losses.
		Use wire with multiple smaller coils instead of one larger coil to increase the number of turns of wire.
		Use optimized-gauge copper to increase the conductor cross section to reduce winding losses.
		Use shape-optimized winding to reduce the proximity effect
		Use low-loss ferrite materials to create the core of the inductor.
	Diodes	Use diodes with a lower voltage drop.
	Capacitors	Use capacitors with a lower effective series resistance.
	Transistors	Use transistors with low drain-to-source resistance.
Improved Circuit Design	Cathode Cutout or Cutback	Remove or reduce cathode/filament heating after lamp has started.
	Integrated Circuits	Substitute discrete components with an integrated circuit.
	Starting Method	Use the IS starting method instead of a rapid start RS starting method.

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 FLBs 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 December 2020 Final Determination. Specifically, DOE seeks information on the range of efficiencies or performance characteristics that are currently available for each technology option.

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 passed to 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 commercially viable, existing 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 projected compliance date of the standard, then that technology will not be considered further.

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

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

(5) *Unique-pathway proprietary technologies.* If a technology has proprietary protection and represents a unique pathway to achieving a given efficiency

level, it will not be considered further, due to the potential for monopolistic concerns.

10 CFR part 430, subpart C, appendix A, sections 6(b)(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 five criteria are eliminated from consideration.

Based on the five screening criteria, DOE did not screen out any technology options in the December 2020 Final Determination. 85 FR 81558, 81567.

DOE requests feedback on what impact, if any, the five screening criteria described in this section would have on each of the technology options listed in Table II.2 with respect to FLBs. Similarly, DOE seeks information regarding how these same criteria would affect any other technology options not already identified in this document with respect to their potential use in FLBs.

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

DOE requests feedback on whether, and if so how, manufacturers would incorporate the technology options listed in Table II.2 to increase energy efficiency in FLBs 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.

DOE also seeks input on the increase in manufacturer production costs ("MPCs") associated with incorporating each particular design option. Specifically, DOE is interested in whether and how the costs estimated for design options in the December 2020 Final Determination 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.

D. Engineering Analysis

The purpose of the engineering analysis is to establish the relationship between the efficiency and cost of FLBs. There are two elements to consider in the engineering analysis; the selection of efficiency levels to analyze (*i.e.*, the "efficiency analysis") and the determination of product cost at each efficiency level (*i.e.*, the "cost analysis"). In determining the performance of higher-efficiency products, DOE considers technologies and design option combinations not eliminated by the screening analysis. For each product class, DOE estimates the baseline cost, as well as the incremental cost for the product at efficiency levels above the baseline. The output of the engineering analysis is a set of cost-efficiency "curves" that are used in downstream analyses (*i.e.*, the life-cycle cost ("LCC") and payback period ("PBP") analyses and the national impact analysis ("NIA")). The following sections seek public input on specific steps of the engineering analysis.

1. Efficiency Analysis

DOE typically uses one of two approaches to develop energy efficiency levels for the engineering analysis: (1) relying on observed efficiency levels in the market (*i.e.*, the efficiency-level approach), or (2) determining the incremental efficiency improvements associated with incorporating specific design options to a baseline model (*i.e.*, the design-option approach). Using the efficiency-level approach, the efficiency levels established for the analysis are determined based on the market distribution of existing products (in other words, based on the range of efficiencies and efficiency level "clusters" that already exist on the market). Using the design option approach, the efficiency levels established for the analysis are determined through detailed engineering calculations and/or computer simulations of the efficiency improvements from implementing specific design options that have been identified in the technology assessment. DOE may also rely on a combination of these two approaches. For example, the efficiency-level approach (based on actual products on the market) may be extended using the design option approach to interpolate to define "gap fill" levels (to bridge large gaps between other identified efficiency levels) and/or to extrapolate to the max-tech level (particularly in cases where the max-tech level exceeds the maximum efficiency level currently available on the market).

In the December 2020 Final Determination, DOE selected more efficient substitutes in the engineering analysis and determined the end-user prices of those substitutes in the product price determination. DOE estimated the end-user price of ballasts directly because reverse engineering ballasts is impractical due to the use of potting, which is a black pitch added to the ballast enclosure to reduce vibration damage and act as a heat sink for the circuit board. 85 FR 81558, 81567. DOE made no changes to the metric used to assess current FLB standards, BLE or to the equation form that relates the total lamp arc power operated by a ballast to BLE. 85 FR 81558, 81569.

$$BLE = \frac{A}{1 + B * power^{-C}}$$

Where: power = total lamp arc power; A, B, and C are constants that are specified in the FLB standard at 10 CFR 430.32(m). In the December 2020 Final Determination, DOE maintained the values for A and C and adjusted the value for B to reflect different efficiency levels in each product class. (85 FR 81558, 81569; see chapter 5 of the December 2020 Final Determination Technical Support Document ("TSD")).

Further to determine the baseline models and efficiency levels, DOE used the BLE values from the compliance certification database to identify ballasts for all product classes except dimming. Because most dimming ballasts are not currently subject to standards and therefore did not have data in the compliance certification database, DOE determined BLE values by using catalog input power and the associated total lamp arc power. 85 FR 81558, 81567.

DOE seeks feedback on the approach of using DOE's compliance certification database, when possible and manufacturer catalogs, otherwise to collect data used in the engineering analysis.

For the December 2020 Final Determination, DOE did not analyze all 8 FLB product classes. 85 FR 81558, 81567-81568. Instead, DOE directly analyzed the following six product classes and ballast types as representative due to their high market volume:

(1) IS/RS Commercial: 2L 4-foot MBP; 4L 4-foot MBP, 2L 8-foot SP slimline.

(2) PS Commercial: 2L 4-foot MBP, 4L 4-foot MBP, 2L 4-foot MiniBP SO, 2L 4-foot MiniBP HO.

(3) IS/RS 8-foot HO: 2L 8-foot recessed double contact ("RDC") HO.

(4) Sign: 4L 8-foot RDC HO.

(5) IS/RS Residential: 2L 4-foot MBP.

(6) Dimming: 2L 4-foot MBP 0-10V, 2L 4-foot MiniBP SO 0-10 V, 2L 4-foot MiniBP HO 0-10 V.

85 FR 81558, 81567-81568.

DOE did not directly analyze the PS 8-foot HO and PS Residential product classes and developed their efficiency levels by scaling the efficiency levels respectively from the IS/RS 8-foot HO and IS/RS Residential product classes. 85 FR 81558, 81571.

DOE requests feedback on the representative product classes and representative ballast types to directly analyze in this analysis.

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. Consistent with this analytical approach, DOE tentatively plans to consider the current minimum energy conservations standards to establish the baseline efficiency levels for each product class. The current standards for FLBs are found at 10 CFR 430.32(m).

DOE requests feedback on whether the current established energy conservation standards for FLBs are 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 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 characterize the baseline efficiency level.

As part of DOE's analysis, the maximum available efficiency level is the highest efficiency unit currently available on the market. 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 applying these design options, DOE would only include those that are compatible with each other that when combined, would represent the theoretical maximum possible efficiency. In many cases, the max-tech efficiency level is not commercially available because it is not economically feasible. As noted previously, in the December 2020 Final Determination, DOE determined max-tech efficiency levels based on products in DOE's compliance certification database for all product classes except, due to lack of data, for the dimming product class. For the dimming product class DOE used manufacturer catalogs. 85 FR 81558, 81567. Table II.3 shows the representative units at the max-tech efficiency levels identified in the December 2020 Final Determination. Table II.4 shows the associated equations for the max-tech efficiency levels. 85 FR 81558, 81569-81571.

Table II.3 Maximum Efficiency Representative Units from the December 2020 Final Determination

Representative Product Class	Ballast Type	Lamp Type	Starting Method	Input Voltage (V)/ Operating Voltage*	Power Factor	Ballast Factor	Input Power (W)	BLE
IS/RS Commercial	2L 4-foot MBP	32 W T8	IS	277, Universal	0.99	0.89	55.3	0.940
	4L 4-foot MBP	32 W T8	IS	277, Universal	0.98	0.87	107.0	0.950
	2L 8-foot SP slimline	59 W T8	IS	277, Universal	0.98	0.87	105.1	0.945
PS Commercial	2L 4-foot MBP	32 W T8	PS	277, Universal	0.98	0.88	53.9	0.953
	4L 4-foot MBP	32 W T8	PS	277, Universal	0.99	0.87	107.6	0.944
	2L 4-foot MiniBP SO	28 W T5	PS	277, Universal	0.98	1.00	59.8	0.929
	2L 4-foot MiniBP HO	54 W T5	PS	277, Universal	0.98	1.00	113.6	0.947
IS/RS 8-foot HO	2L 8-foot RDC HO	110 W T12	RS	277, Universal	0.98	0.90	188.0	0.957
Sign	4L 8-foot RDC HO	110 W T12	IS	120, Dedicated	0.90	0.61	258.4	0.944
IS/RS Residential	2L 4-foot MBP	32 W T8	IS	120, Dedicated	0.55	0.83	53.1	0.913
Dimming	2L 4-foot MBP 0-10V	32 W T8	PS	277, Universal	0.99	0.88	56.0	0.918
	2L 4-foot MiniBP SO 0-10V	28 W T5	PS	277, Universal	0.99	1.00	61.0	0.911
	2L 4-foot MiniBP HO 0-10V	54 W T5	PS	277, Universal	0.98	1.00	115.9	0.928

Table II.4 Maximum Efficiency Levels from the December 2020 Final Determination Rule

	Maximum efficiency level A/(1+B*total lamp arc power^-C)		
Representative Product Class	**A**	**B**	**C**
IS/RS Commercial	0.993	0.16	0.25
PS Commercial	0.993	0.31	0.37
IS/RS Residential	0.993	0.24	0.25
IS/RS 8-foot HO	0.993	0.14	0.25
Sign	0.993	0.24	0.25
Dimming	0.993	0.4	0.37

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 seeks comment on whether the max tech levels have changed since the December 2020 Final Determination.

DOE also requests feedback on whether the maximum available efficiencies presented in Table II.4 are representative of those for the other FLBs product classes not directly analyzed in the December 2020 Final Determination. If the range of possible efficiencies is different for the other product classes not directly analyzed, DOE requests information on alternative approaches DOE should consider using for those product classes.

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.

2. Cost Analysis

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. The cost analysis portion of the engineering analysis is conducted using one or a combination of cost approaches. The selection of cost approach depends on a suite of factors, including availability and reliability of public information, characteristics of the regulated product, and the availability and timeliness of purchasing the product on the market. The cost approaches are summarized as follows:

- *Physical teardowns:* Under this approach, DOE physically dismantles a commercially available product, component-by-component, to develop a detailed bill of materials for the product.
- *Catalog teardowns:* In lieu of physically deconstructing a product, DOE identifies each component using parts diagrams (available from manufacturer websites or appliance repair websites, for example) to develop the bill of materials for the product.
- *Price surveys:* If neither a physical nor catalog teardown is feasible (for example, for tightly integrated products such as fluorescent lamps, which are infeasible to disassemble and for which parts diagrams are unavailable) or cost-prohibitive and otherwise impractical (*e.g.* large commercial boilers), DOE conducts price surveys using publicly available pricing data published on major online retailer websites and/or by soliciting prices from distributors and other commercial channels.

Using the price survey approach, in the December 2020 Final Determination, DOE developed end-user prices for the representative units sold in each of the main distribution channels identified for FLBs. DOE then calculated an average weighted end-user price using estimated shipments that go through each distribution channel. 85 FR 81558, 81571.

Specifically, in the December 2020 Final Determination, DOE identified two types of distribution channels through which most FLBs pass from the manufacturer to the consumer: the fixture ballast distribution channel and the replacement ballast distribution channel. The fixture ballast distribution channel applies to ballasts sold in fixtures where the manufacturer sells the ballast to a fixture manufacturer—who in turn sells the fixture, including the ballast, to an electrical wholesaler. The replacement ballast distribution channel applies to ballasts sold without fixtures (*e.g.,* replacement ballasts) where the manufacturer sells the ballast directly to an electrical wholesaler. DOE determined that in both distribution channels, electrical wholesalers sell ballasts to the consumer in (1) large volume via a contractor; (2) in large volume without a contractor; or (3) in low volume without a contractor. DOE assumed that the low volume path accounted for the distribution of residential ballasts. (85 FR 81558, 81571; see chapter 6 of the December 2020 Final Determination TSD).

DOE collected prices from electrical distributors and internet retailers for each representative unit and/or ballast with similar performance characteristics to develop an average wholesaler price. DOE then used this average wholesaler price to determine the end-user prices for ballasts going through each wholesaler pathway: large volume (no contractor), large volume (with contractor), and low volume (no contractor). For the large volume (contractor) pathway, DOE applied an estimated contractor markup of 13 percent to the average wholesaler prices as these ballasts are purchased in large quantities through a contractor. For the low volume (no contractor) pathway ballasts DOE applied an estimated 20 percent markup to the average wholesaler price as these ballasts are purchased in smaller quantities by consumers directly from the electrical wholesaler. (85 FR 81558, 81571; see chapter 6 of the December 2020 Final Determination TSD).

DOE then weighted the large volume (with contractor) price by 85 percent; large volume (no contractor) price by 10 percent; and low volume (no contractor) price by 5 percent to develop an average weighted end-user price for each representative unit. DOE used this average weighted end-user price as the price paid through the replacement channel and for the fixture channel, applied a 21 percent original equipment manufacturer ("OEM") markup to it. DOE then applied a 50 percent weighting to the resulting replacement channel price and fixture channel price to obtain the final average end-user price for each representative unit. (85 FR 81558, 81571; see chapter 6 of the December 2020 Final Determination TSD).

DOE requests feedback on the whether the methodology described above for the cost analysis is appropriate, as well as information on the existence of any distribution channels other than those described and their assigned weighting.

DOE requests feedback on whether the prices of FLBs have changed since the December 2020 Final Determination. In particular, DOE requests comment on whether the incremental difference between the price of a ballast at the baseline level and the price of a ballast at a higher efficiency level (including the max tech level) has changed.

E. 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 fluorescent lamp ballasts 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. Operating Hours

In the December 2020 Final Determination, DOE developed annual operating hours by sector using the most recent data available from the 2015 U.S. Lighting Market Characterization ("LMC") which was published in 2017.[4] 85 FR 81558, 81572. As stated in the December 2020 Final Determination TSD, fluorescent lamp ballasts operated 721 hours in the residential sector; 3,017 hours in the commercial sector (IS/RS ballasts); 2,112 hours in the commercial sector (PS ballasts and accounts for lighting controls); 4,380 hours in the industrial sector; and 3,285 hours in the outdoor sector. (See chapter 6 of the December 2020 Final Determination TSD).

In Table II.5 DOE calculated the average annual energy use by multiplying the operating hours per sector times the input power of representative units at the max-tech efficiency levels identified in the December 2020 Final Determination from Table II.4. This would be a similar approach that DOE would use in the energy-use analysis.

[4] U.S. Department of Energy–Office of Energy Efficiency and Renewable Energy. 2015 U.S. Lighting Market Characterization. November 2017. *https://energy.gov/eere/ssl/2015-us-lighting-marketcharacterization*.

Table II.5 Maximum Efficiency Input Power Ratings and Average Energy Use from the December 2020 Final Determination

Representative Product Class	Ballast Type	Lamp Type	Starting Method	Input Voltage (V)/ Operating Voltage*	Input Power *(W)*	Average Operating Hours *Hours / year*	Average Annual Energy Use *kWh/year*
IS/RS Commercial	2L 4-foot MBP	32 W T8	IS	277, Universal	55.3	3,153	174
	4L 4-foot MBP	32 W T8	IS	277, Universal	107.0	3,153	337
	2L 8-foot SP slimline	59 W T8	IS	277, Universal	105.1	3,153	331
PS Commercial	2L 4-foot MBP	32 W T8	PS	277, Universal	53.9	2,339	126
	4L 4-foot MBP	32 W T8	PS	277, Universal	107.6	2,339	252
	2L 4-foot MiniBP SO	28 W T5	PS	277, Universal	59.8	2,339	140
	2L 4-foot MiniBP HO	54 W T5	PS	277, Universal	113.6	2,339	266
IS/RS 8-foot HO	2L 8-foot RDC HO	110 W T12	RS	277, Universal	188.0	3,153	593
Sign	4L 8-foot RDC HO	110 W T12	IS	120, Dedicated	258.4	3,285	849
IS/RS Residential	2L 4-foot MBP	32 W T8	IS	120, Dedicated	53.1	721	38
Dimming	2L 4-foot MBP 0-10V	32 W T8	PS	277, Universal	56.0	2,971	166
	2L 4-foot MiniBP SO 0-10V	28 W T5	PS	277, Universal	61.0	2,971	181
	2L 4-foot MiniBP HO 0-10V	54 W T5	PS	277, Universal	115.9	2,971	344

DOE requests feedback on data sets to determine operating hours for fluorescent lamp ballasts, and the approach of multiplying the operating hours by input power to determine energy usage.

2. Lamp Mixture

Fluorescent lamp ballasts operate general service fluorescent lamps ("GSFL") and in some cases tubular light-emitting diodes ("TLEDs") intended for direct replacement of

GSFLs (known as UL Type A or UL Type A/B TLEDs). Although neither GSFLs nor TLEDs are within the scope of this potential amended standard, the mixture of these lamps directly affects the energy use of fluorescent lamp ballasts.

In the December 2020 FLB Final Determination, DOE assumed for certain ballasts that the ballast would operate a reduced wattage option of the lamp or a TLED. Table II.6 is from the December 2020 Final Determination TSD.

Table II.6 Weighting Factors for Ballast-Lamp Combinations for Fluorescent Lamp Ballasts by Product Class from December 2020 Final Determination

Product Class	Ballast	Lamp Type	Weighting Factor in 2023*
IS/RS Commercial	2L 4-foot Medium Bipin (MBP)	F32T8	19
IS/RS Commercial	2L 4-foot MBP	F32T8 (28W)	45
IS/RS Commercial	2L 4-foot MBP	F32T8 (25W)	10
IS/RS Commercial	2L 4-foot MBP	TLED	26
IS/RS Commercial	2L 4-foot MBP	F40T12	0
IS/RS Commercial	4L 4-foot MBP	F32T8	19
IS/RS Commercial	4L 4-foot MBP	F32T8 (28W)	45
IS/RS Commercial	4L 4-foot MBP	F32T8 (25W)	10
IS/RS Commercial	4L 4-foot MBP	TLED	26
IS/RS Commercial	2L 8-foot Slimline	F96T8 (59W)	71
IS/RS Commercial	2L 8-foot Slimline	F96T8 (54W)	5
IS/RS Commercial	2L 8-foot Slimline	F96T8 (50W)	4
IS/RS Commercial	2L 8-foot Slimline	F96T12 (75W)	21
PS Commercial	2L 4-foot MBP	F32T8	19
PS Commercial	2L 4-foot MBP	F32T8 (28W)	45
PS Commercial	2L 4-foot MBP	F32T8 (25W)	10
PS Commercial	2L 4-foot MBP	TLED	26
PS Commercial	4L 4-foot MBP	F32T8	19
PS Commercial	4L 4-foot MBP	F32T8 (28W)	45
PS Commercial	4L 4-foot MBP	F32T8 (25W)	10
PS Commercial	4L 4-foot MBP	TLED	26
PS Commercial	2L 4-foot miniature bipin (MiniBP) standard output (SO)	F28T5	100
PS Commercial	2L 4-foot MiniBP SO	F28T5 (26W)	0
PS Commercial	2L 4-foot MiniBP SO	F28T5 (25W)	0
PS Commercial	2L 4-foot MiniBP HO	F54T5HO	56
PS Commercial	2L 4-foot MiniBP HO	F54T5HO (49W)	21
PS Commercial	2L 4-foot MiniBP HO	F54T5HO (47W)	23
IS/RS 8-foot HO	2L 8-foot recessed double contact (RDC) HO	F96T12HOCT (110W)	100
IS/RS 8-foot HO	2L 8-foot RDC HO	F96T8HO	0
Sign	2L 4-foot MBP	F96T12HOCT (110W)	100
Sign	2L 4-foot MBP	F96T8HOCT	0
IS/RS Residential	2L 4-foot MBP	F32T8	32
IS/RS Residential	2L 4-foot MBP	F32T8 (28W)	33
IS/RS Residential	2L 4-foot MBP	F32T8 (25W)	7
IS/RS Residential	2L 4-foot MBP	TLED	26

Product Class	Ballast	Lamp Type	Weighting Factor in 2023*
IS/RS Residential	2L 4-foot MBP	F40T12	2
Dimming	2L 4-foot MBP	F32T8	92
Dimming	2L 4-foot MBP	F32T8 (28W)	7
Dimming	2L 4-foot MBP	F32T8 (25W)	1
Dimming	2L 4-foot MiniBP SO	F28T5	100
Dimming	2L 4-foot MiniBP HO	F54T5HO	100

*Weights may not total to 100 percent for each and every ballast due to rounding.

DOE requests feedback on the proportion of lamps operating on fluorescent ballasts in 2023 and how that mixture is expected to change over time.

F. Life-Cycle Cost and Payback Analysis

DOE conducts the LCC and PBP analysis to evaluate the economic effects of potential energy conservation standards for FLBs on individual consumers. For any given efficiency level, DOE measures the PBP and the change in LCC relative to an estimated baseline level. The LCC is the total consumer expense over the life of the equipment, consisting of purchase, installation, and operating costs (expenses for energy use, maintenance, and repair). Inputs to the calculation of total installed cost include the cost of the equipment—which includes manufacturer selling prices (‘‘MSPs’’), distribution channel markups, and sales taxes—and installation costs. Inputs to the calculation of operating expenses include annual energy consumption, energy prices and price projections, repair and maintenance costs, product lifetimes, discount rates, and the year that compliance with new and amended standards is required.

1. Installation Costs

Installation cost includes labor, overhead, and any miscellaneous materials and parts needed to install the product. DOE used data from RSMeans to estimate the baseline installation cost for fluorescent lamp ballasts. In the December 2020 Final

Determination, DOE used the same installation costs for ballasts at each level. 85 FR 81558, 81574.

DOE requests information on installation costs of fluorescent lamp ballasts; using RSMeans (or other data sources) for labor; and treating the installation cost the same for all efficiency levels.

2. Repair and Maintenance Costs

Repair costs are associated with repairing or replacing product components that have failed in an appliance; maintenance costs are associated with maintaining the operation of the product. In the December 2020 Final Determination, DOE modeled ballasts as not being repaired. 85 FR 81558, 81574. In the December 2020 Final Determination, DOE modeled no direct maintenance on the ballasts and maintenance only related to fluorescent lamp replacement. 85 FR 81558, 81574.

DOE requests information and data on the frequency of repair and repair costs by product class for the technology options listed in Table II.2 of this document. Although DOE is interested in information regarding each of the listed technology options. DOE is also interested in whether consumers replace the products when they fail, as opposed to repairing them.

DOE requests feedback and data on whether maintenance costs differ in comparison to the baseline maintenance costs for any of the specific technology options listed in Table II.2 of this document.

3. Efficiency Distributions

To estimate the share of affected consumers who would likely be affected by a standard at a particular efficiency level, the LCC analysis considers the estimated distributions of efficiencies of products that consumers purchase under the no-new-standards case (*i.e.*, base efficiency distributions). In the December 2020 Final Determination, DOE developed efficiency distributions from DOE's Compliance Certification Database.[5]

DOE requests information on efficiency distributions of FLBs and for other sources besides DOE's Compliance Certification Database.

4. Product Lifetimes

In the December 2020 Final Determination, DOE discussed the review of fluorescent ballast lifetime. DOE used 12.5-year average lifetime for commercial sector installations, 11.4-year average lifetime for industrial sector installations, a 12.5-year average lifetime for outdoor lighting, and a 15-year life for the residential sector. 85 FR 81558, 81574-81575.

DOE requests information on the rated lifetime of fluorescent lamp ballasts. DOE also requests information on the frequency of fluorescent lamp ballasts that may be prematurely retired before end of expected lifetime.

[5] For the public version of DOE's Compliance Certification Management System, see *https://www.regulations.doe.gov/ccms*.

G. Shipments

DOE develops shipments forecasts of fluorescent lamp ballasts 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 and lamp quantity. Current sales estimates allow for a more accurate model that captures recent trends in the market.

Fluorescent lamp ballasts operate GSFL and in some cases TLEDs intended for direct replacement of GSFLs (known as UL Type A or UL Type A/B TLEDs). Although neither GSFLs nor TLEDs are within the scope of this potential amended standard, shipments of these technologies directly relate to shipment volume of fluorescent lamp ballasts.

On February 13, 2023, DOE published a final determination to not amend standards for GSFLs. 88 FR 9118 ("February 2023 GSFL Final Determination"). In this determination DOE forecasted shipments of GSFLs and TLEDs. DOE only received one comment on the shipments analysis for the February 2023 GSFL Final Determination which was from the National Electrical Manufacturers Association ("NEMA"). NEMA directed DOE to the NEMA Lamp Index[6] for GSFLs. (Docket No. EERE-2019-BT-STD-0030, NEMA, No. 18 at p. 3) DOE reviewed the sales indices of the linear lamp market published by NEMA for 2015 – 2020. DOE included that data to seed DOE's GSFL shipment model. These indices show a steep decline of GSFL sales for all lamp types over that five-year period. 88 FR 9118, 9130.

[6] NEMA Lamp Indices, available at *https://www.nema.org/analytics/lamp-indices*.

In the February 2023 GSFL Final Determination, DOE assumed that in each shipment's projection year, demand would only be for replacement service of existing GSFL installation and not for new installations. 88 FR 9118, 9130. DOE also assumed that a fixed fraction of all tubular lamp stock (both GSFL and TLEDs) in each year leave the market because of retrofits or renovations to integrated LED fixtures. As a result of this assumption, the total number of lamps that may retire per year is reduced and ultimately each year the tubular lamp market reduces in size. (*Id.)* If the linear lamp market reduces in size because of renovations that retire linear lamps for LED fixtures, this also reduces the size of the FLB market each year.

In the February 2023 GSFL Final Determination, based on multiple inputs and assumptions, the GSFL shipments model forecasted that the linear lamp market would continue to shift quickly to LED over the analysis period (2021 – 2055) in the no-new-standards case. 88 FR 9118, 9130.

On October 22, 2019, DOE published a notice of proposed determination ("October 2019 FLB Proposed Determination"). 84 FR 56540. In the October 2019 FLB Proposed Determination, DOE stated that DOE agreed with commenters that FLB shipments were declining and modeled four no-new standards.

(1) Scenario #1 – declining shipments that all terminate in 2024. This scenario is based on the data supplied by NEMA and others depicting the decline between 2010 and 2014. The scenario also assumes at all new construction migrates to other lights sources than fluorescent technology.

(2) Scenario #2 – declining shipments that all terminate in 2040. This scenario was based on comments from manufacturers during the manufacturer impact analysis ("MIA") process and written comments of a reduction in shipments

of 10 to 20 percent per year. This scenario assumes that most new construction is utilizing other light sources besides fluorescent technology.

(3) Scenario #3 – declining shipments that approach zero near the end of the analysis period (2052). This scenario is close to a year-over-year linear reduction of shipments by 20 percent. This scenario was based on data of shipments of other lighting technologies. The rate of decline is less compared to the scenario 2 partially to address comments received about UL Type A TLEDs operating on fluorescent lamp ballasts.

(4) Scenario #4 – declining shipments that terminate near the end of the analysis period. This scenario is based on a slower declination rate in the initial part of the analysis period and is similar to a projected decline in fluorescent lamps. This scenario was based on a slower decline rate in the initial part of the analysis period. 84 FR 56540, 56572.

In response to the October 2019 FLB Proposed Determination, NEMA commented that any shipment scenario that includes a near-20 percent rate of decline is useful for estimations and modeling (Docket No. EERE-2015-BT-STD-0006, NEMA, No. 24 at p. 5).

In the December 2020 FLB Final Determination, DOE chose scenario #3 (declining shipments that approach zero near 2052 with an approximate linear year-over-year reduction of shipments by 20 percent) as the Reference case. 85 FR 81558, 81576.

Table II.7 lists the forecasted shipments from the December 2020 Final Determination for fluorescent lamp ballasts for all four scenarios. Table II.7 lists the forecasted shipments for 2022 to help calibrate the shipments model for this analysis. DOE listed the shipments for forecasted for 2030, 2040, and 2050 to reflect the forecasted decline of shipments.

Table II.7 Shipments for Fluorescent Lamp Ballasts by Product Class from December 2020 Final Determination

Representative Product Class	Scenario	Shipments Forecast in 2022	Shipments Forecast in 2030	Shipments Forecast in 2040	Shipments Forecast in 2050
IS/RS Commercial	1	893,452	0	0	0
	2	11,648,580	2,264,359	147	0
	3	13,935,358	7,040,094	2,446,833	481,719
	4	17,099,980	12,684,172	4,831,126	1,601,403
PS Commercial	1	391,293	0	0	0
	2	5,101,568	991,690	64	0
	3	6,103,076	3,083,253	1,071,606	210,972
	4	7,489,042	5,233,030	2,115,822	701,344
IS/RS 8-foot HO	1	8,152	0	0	0
	2	106,283	20,660	1	0
	3	127,147	64,234	22,325	4,395
	4	156,022	109,021	44,080	14,611
Sign	1	48,912	0	0	0
	2	637,696	123,961	8	0
	3	762,885	385,407	133,951	26,371
	4	936,130	654,129	264,478	87,668
IS/RS Residential	1	163,055	0	0	0
	2	2,125,866	413,246	27	0
	3	2,543,203	1,284,817	446,547	87,914
	4	3,120,746	2,180,647	881,681	292,256
Dimming	1	30,977	0	0	0
	2	403,874	78,509	5	0
	3	483,160	244,091	84,835	16,702
	4	592,883	414,282	167,503	55,523

DOE requests 2022 annual sales data (*i.e.*, number of shipments) for fluorescent lamp ballasts by product class. If disaggregated fractions of annual sales are not available at the product class level, DOE requests more aggregated fractions of annual sales at the product class level. Sales data for 2022 will allow DOE to calibrate the shipment model.

DOE requests 2020 and 2022 data on the fraction of sales in the residential and commercial sector for IS/RS ballasts.

If available, DOE requests historical sales information for the product classes in Table II.7 for the previous five years (2017-2022).

DOE requests information considering the February 2023 GSFL Final Determination about which shipment scenario from the December 2020 Final Determination is now most likely for fluorescent lamp ballasts.

H. National Impact Analysis

The purpose of the national impact analysis ("NIA") is to estimate the aggregate economic impacts of potential efficiency standards at the national level. The NIA assesses the national energy savings ("NES") and the national net present value ("NPV") of total consumer costs and savings that would be expected to result from new or amended standards at specific efficiency levels.

In the December 2020 Final Determination, DOE evaluated the effects of new and amended standards for fluorescent lamp ballasts by comparing no-new-standard-case projections with standards-case projections. The no-new-standards-case projections characterize energy use and consumer costs for each product class in the absence of new or amended energy conservation standards. DOE compared these projections with projections characterizing the market for each product class if DOE adopted new or amended standards at specific energy efficiency levels for that class. In charactering the no-new-standards and standards cases, DOE considered historical shipments, the mix of efficiencies sold in the absence of amended standards, and how that mix may change over time. The December 2020 Final Determination assumed no rebound effect. DOE stated that most consumers are commercial and industrial consumers, and that the user tends to not see the energy bills, so there would be no perceived change in the cost of using the light. 85 FR 81588, 81573.

DOE requests feedback and information on whether a rebound rate of 0 percent is appropriate for fluorescent lamp ballasts. If an alternate rebound rate should be used, DOE requests information and data in support of the alternate rate.

I. Manufacturer Impact Analysis

The purpose of the manufacturer impact analysis ("MIA") is to estimate the financial impact of amended energy conservation standards on manufacturers of FLBs, 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.[7] Manufacturing of FLBs is classified under NAICS 335311, "Power, Distribution, and Specialty Transformer Manufacturing," and the SBA sets a threshold of 750 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

[7] Available online at www.sba.gov/document/support-table-size-standards (last accessed February 13, 2023).

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 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.

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

DOE identified small businesses as a subgroup of manufacturers that could be disproportionally impacted by amended energy conservation standards. DOE requests the names and contact information of small business manufacturers, as defined by the SBA's size threshold, of FLBs that manufacture 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.

DOE requests information regarding the cumulative regulatory burden impacts on manufacturers of FLBs 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.

III. Submission of Comments

DOE invites all interested parties to submit in writing by the date specified in the **DATES** section of this document, comments and information on matters addressed in this document and on other matters relevant to DOE's consideration of amended energy conservations standards for FLBs. After the close of the comment period, DOE will review the public comments received and may begin collecting data and conducting the analyses discussed in this document.

Submitting comments via *www.regulations.gov*. The *www.regulations.gov* webpage 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. If this instruction is followed, 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 *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 *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 *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 *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. No 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. Pursuant 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 to *FLB2023STD0005@ee.doe.gov* 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" with the information believed to be confidential deleted. 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 conservation standards. DOE actively encourages the participation and interaction of the public during the comment period in this process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this process or would like to request a public meeting should contact Appliance and Equipment Standards Program staff at (202) 287-1445 or via email at *ApplianceStandardsQuestions@ee.doe.gov*.

Signing Authority

This document of the Department of Energy was signed on March 21, 2023, by Francisco Alejandro Moreno, Acting Assistant Secretary for 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 March 22, 2023

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

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