DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE-2020-BT-STD-0007]

RIN 1904-AE63

Energy Conservation Program: Energy Conservation Standards for Electric Motors

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

ACTION: Notice of proposed rulemaking.

SUMMARY: The Energy Policy and Conservation Act, as amended ("EPCA"), prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including electric motors. In this document, DOE proposes amended energy conservation standards for electric motors identical to those set forth in a direct final rule published elsewhere in this *Federal Register*. If DOE receives an adverse comment and determines that such comment may provide a reasonable basis for withdrawing the direct final rule, DOE will publish a notice withdrawing the direct final rule and will proceed with this proposed rule.

DATES: *Comments*: DOE will accept comments, data, and information regarding this NOPR no later than [**INSERT DATE 110 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***].

Comments regarding the likely competitive impact of the proposed standard should be sent to the Department of Justice contact listed in the **ADDRESSES** section 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-2020-BT-STD-

0007. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2020-BT-STD-0007, by any of the following methods:

Email: *ElecMotors2020STD0007@ee.doe.gov*. Include the docket number EERE-2020-BT-STD-0007 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. If possible, please submit all items on a compact disc ("CD"), in which case it is not necessary to include printed copies.

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. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this process, see section V 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, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

The docket webpage can be found at *www.regulations.gov/docket/EERE-2020-BT-STD-0007*. The docket webpage contains instructions on how to access all documents, including public comments, in the docket. See section V of this document for information on how to submit comments through *www.regulations.gov*.

EPCA requires the Attorney General to provide DOE a written determination of whether the proposed standard is likely to lessen competition. The U.S. Department of Justice Antitrust Division invites input from market participants and other interested persons with views on the likely competitive impact of the proposed standard. Interested persons may contact the Division at *energy.standards@usdoj.gov* on or before the date specified in the **DATES** section. Please indicate in the "Subject" line of your email the title and Docket Number of this proposed rulemaking.

FOR FURTHER INFORMATION CONTACT: Mr. Jeremy Dommu, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies, EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. E-mail: *ApplianceStandardsQuestions@ee.doe.gov.*

Mr. Matthew Ring, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-2555. Email: *Matthew.Ring@hq.doe.gov*.

For further information on how to submit a comment, 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. Synopsis of the Proposed Rule

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 C[2] of EPCA established the Energy Conservation Program for Certain Industrial Equipment. (42 U.S.C. 6311-6317). Such equipment includes electric motors, the subject of this rulemaking.

Pursuant to EPCA, any new or amended energy conservation standard must be designed to achieve the maximum improvement in energy efficiency that DOE determines is technologically feasible and economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(A)) Furthermore, the new or amended standard must result in a significant conservation of energy. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(3)(B)) EPCA also provides that not later than 6 years after issuance of any final rule establishing or amending a standard, DOE must publish either a notice of determination that standards for the product do not need to be amended, or a notice of proposed rulemaking including

[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 C was re-designated Part A-1.

new proposed energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6316(a); 42 U.S.C. 6295(m))

Elsewhere in this *Federal Register*, DOE is issuing a direct final rule amending the energy conservation standards for electric motors, along with this proposed rule as required by EPCA. (42 U.S.C. 6295(p)(4)(A)(i)) The amended standard levels in that document were submitted in a joint recommendation (the "November 2022 Joint Recommendation")[3] by the American Council for an Energy-Efficient Economy ("ACEEE"), Appliance Standards Awareness Project ("ASAP"), National Electrical Manufacturers Association ("NEMA"), Natural Resources Defense Council ("NRDC"), Northwest Energy Efficiency Alliance ("NEEA"), Pacific Gas & Electric Company ("PG&E"), San Diego Gas & Electric ("SDG&E"), and Southern California Edison ("SCE"), hereinafter referred to as "the Electric Motors Working Group." In a letter comment submitted December 12, 2022, the New York State Energy Research and Development Authority ("NYSERDA") expressed its support of the November 2022 Joint Recommendation and urged DOE to implement it in a timely manner. DOE has determined that the November 2022 Joint Recommendation complies with the requirements of EPCA for issuance of a direct final rule. (42 U.S.C. 6295(p)(4)(A)(i))

In accordance with these and other statutory provisions discussed in this document, DOE proposes new and amended energy conservation standards for electric motors. The proposed standards, which are expressed in full-load efficiency, are shown in Table I.1, Table I.2 and Table I.3.

[3] Joint comment response to the published Notification of a webinar and availability of preliminary technical support document; *https://www.regulations.gov/comment/EERE-2020-BT-STD-0007-0035*.

Table I.1 Proposed Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B and IEC Design N, NE, NEY or NY Motors (Excluding Fire Pump Electric Motors and Air-Over Electric Motors) at 60 Hz

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20/15	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25/18.5	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30/22	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40/30	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50/37	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60/45	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75/55	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100/75	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125/90	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150/110	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200/150	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250/186	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4
300/224	95.8	95.4	96.2	95.8	95.8	95.8	--	--
350/261	95.8	95.4	96.2	95.8	95.8	95.8	--	--
400/298	95.8	95.8	96.2	95.8	--	--	--	--
450/336	95.8	96.2	96.2	96.2	--	--	--	--
500/373	95.8	96.2	96.2	96.2	--	--	--	--
550/410	95.8	96.2	96.2	96.2	--	--	--	--
600/447	95.8	96.2	96.2	96.2	--	--	--	--
650/485	95.8	96.2	96.2	96.2	--	--	--	--
700/522	95.8	96.2	96.2	96.2	--	--	--	--
750/559	95.8	96.2	96.2	96.2	--	--	--	--

Table I.2 Proposed Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B and IEC Design N, NE, NEY or NY Standard Frame Size Air-Over Electric Motors (Excluding Fire Pump Electric Motors) at 60 Hz

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20/15	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25/18.5	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30/22	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7

40/30	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50/37	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60/45	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75/55	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100/75	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125/90	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150/110	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200/150	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250/186	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4

Table I.3 PROPOSED NOMINAL FULL-LOAD EFFICIENCIES OF NEMA DESIGN A, NEMA DESIGN B AND IEC DESIGN N, NE, NEY OR NY SPECIALIZED FRAME SIZE AIR-OVER ELECTRIC MOTORS (EXCLUDING FIRE PUMP ELECTRIC MOTORS) AT 60 HZ

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	74.0	--	82.5	82.5	80.0	80.0	74.0	74.0
1.5/1.1	82.5	82.5	84.0	84.0	85.5	84.0	77.0	75.5
2/1.5	84.0	84.0	84.0	84.0	86.5	85.5	82.5	85.5
3/2.2	85.5	84.0	87.5	86.5	87.5	86.5	84.0	86.5
5/3.7	87.5	85.5	87.5	87.5	87.5	87.5	85.5	87.5
7.5/5.5	88.5	87.5	89.5	88.5	89.5	88.5	85.5	88.5
10/7.5	89.5	88.5	89.5	89.5	89.5	90.2	--	--
15/11	90.2	89.5	91.0	91.0	--	--	--	--
20/15	90.2	90.2	91.0	91.0	--	--	--	--

II. Introduction

The following section briefly discusses the statutory authority underlying this proposed rule, as well as some of the relevant historical background related to the establishment of standards for electric motors.

A. Authority

EPCA authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. Title III, Part C[4] of EPCA added by Pub. L. 95-619, Title IV, section 441(a) (42 U.S.C. 6311-6317, as codified), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a

[4] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

variety of provisions designed to improve the energy efficiency of certain types of industrial equipment, including electric motors, the subject of this proposed rule. (42 U.S.C. 6311(1)(A)). The Energy Policy Act of 1992 ("EPACT 1992") (Pub. L. 102-486 (Oct. 24, 1992)) further amended EPCA by establishing energy conservation standards and test procedures for certain commercial and industrial electric motors that are manufactured alone or as a component of another piece of equipment. In December 2007, Congress enacted the Energy Independence and Security Act of 2007 ("EISA 2007") (Pub. L. 110-140 (Dec. 19, 2007). Section 313(b)(1) of EISA 2007 updated the energy conservation standards for those electric motors already covered by EPCA and established energy conservation standards for a larger scope of motors not previously covered by standards. (42 U.S.C. 6313(b)(2)) EISA 2007 also revised certain statutory definitions related to electric motors. *See* EISA 2007, sec. 313 (amending statutory definitions related to electric motors at 42 U.S.C. 6311(13)).

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) the establishment of Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), energy conservation standards (42 U.S.C. 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6316; 42; U.S.C. 6296).

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and (b); 42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption in limited instances for particular State laws or regulations, in accordance with the procedures and other provisions set forth

under EPCA. (*See* 42 U.S.C. 6316(a) (applying the preemption waiver provisions of 42 U.S.C. 6297))

Subject to certain criteria and conditions, DOE is required to develop test procedures to measure the energy efficiency, energy use, or estimated annual operating cost of each covered product. (42 U.S.C. 6314(a), 42 U.S.C. 6295(o)(3)(A) and 42 U.S.C. 6295(r)) Manufacturers of covered equipment must use the Federal test procedures as the basis for: (1) certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(a); 42 U.S.C. 6295(s)), and (2) making representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE must use these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA. (42 U.S.C. 6316(a); 42 U.S.C. 6295(s)) The DOE test procedures for electric motors appear at title 10 of the Code of Federal Regulations ("CFR") part 431, subpart B, appendix B.

EPCA further provides that, not later than 6 years after the issuance of any final rule establishing or amending a standard, DOE must publish either a notice of determination that standards for the product do not need to be amended, or a notice of proposed rulemaking including new proposed energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(1))

DOE must follow specific statutory criteria for prescribing new or amended standards for covered equipment, including electric motors. Any new or amended standard for a covered product must be designed to achieve the maximum improvement in energy efficiency that the Secretary of Energy determines is technologically feasible and economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(A) and 42 U.S.C.

6295(o)(3)(B)) Furthermore, DOE may not adopt any standard that would not result in the significant conservation of energy. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(3))

Moreover, DOE may not prescribe a standard: (1) for certain products, including electric motors, if no test procedure has been established for the product, or (2) if DOE determines by rule that the standard is not technologically feasible or economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(3)(A)-(B)) In deciding whether a proposed standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(B)(i)) DOE must make this determination after receiving comments on the proposed standard, and by considering, to the greatest extent practicable, the following seven statutory factors:

(1) The economic impact of the standard on manufacturers and consumers of the products subject to the standard;
(2) The savings in operating costs throughout the estimated average life of the covered products in the type (or class) compared to any increase in the price, initial charges, or maintenance expenses for the covered products that are likely to result from the standard;
(3) The total projected amount of energy (or as applicable, water) savings likely to result directly from the standard;
(4) Any lessening of the utility or the performance of the covered 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 ("Secretary") considers relevant.

(42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(B)(i)(I)-(VII))

Further, EPCA, as codified, establishes a rebuttable presumption that a standard is economically justified if the Secretary finds that the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy savings during the first year that the consumer will receive as a result of the standard, as calculated under the applicable test procedure. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(B)(iii))

EPCA, as codified, also contains what is known as an "anti-backsliding" provision, which prevents the Secretary from prescribing any amended standard that either increases the maximum allowable energy use or decreases the minimum required energy efficiency of a covered product. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(1)) Also, the Secretary may not prescribe an amended or new standard if interested persons have established by a preponderance of the evidence that the standard is likely to result in the unavailability in the United States in any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United States. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(4))

Additionally, EPCA specifies requirements when promulgating an energy conservation standard for a covered product that has two or more subcategories. DOE must specify a different standard level for a type or class of products that has the same function or intended use, if DOE determines that products within such group: (A) consume a different kind of energy from that consumed by other covered products within such type (or class); or (B) have a capacity or other performance-related feature which

other products within such type (or class) do not have and such feature justifies a higher or lower standard. (42 U.S.C. 6316(a); 42 U.S.C. 6295(q)(1)) In determining whether a performance-related feature justifies a different standard for a group of products, DOE must consider such factors as the utility to the consumer of such a feature and other factors DOE deems appropriate. *Id*. Any rule prescribing such a standard must include an explanation of the basis on which such higher or lower level was established. (42 U.S.C. 6316(a); 42 U.S.C. 6295(q)(2))

Finally, EISA 2007 amended EPCA, in relevant part, to grant DOE authority to issue a final rule (*i.e.*, a "direct final rule") establishing an energy conservation standard on receipt of a statement submitted jointly by interested persons that are fairly representative of relevant points of view (including representatives of manufacturers of covered products, States, and efficiency advocates), as determined by the Secretary, that contains recommendations with respect to an energy or water conservation standard that are in accordance with the provisions of 42 U.S.C. 6295(o). (42 U.S.C. 6295(p)(4)) Pursuant to 42 U.S.C. 6295(p)(4), the Secretary must also determine whether a jointly-submitted recommendation for an energy or water conservation standard satisfies 42 U.S.C. 6295(o) or 42 U.S.C. 6313(a)(6)(B), as applicable.

The direct final rule must be published simultaneously with a NOPR that proposes an energy or water conservation standard that is identical to the standard established in the direct final rule, and DOE must provide a public comment period of at least 110 days on this proposal. (42 U.S.C. 6295(p)(4)(A)-(B)) Based on the comments received during this period, the direct final rule will either become effective, or DOE will withdraw it not later than 120 days after its issuance if (1) one or more adverse comments is received, and (2) DOE determines that those comments, when viewed in light of the rulemaking

record related to the direct final rule, provide a reasonable basis for withdrawal of the direct final rule under 42 U.S.C. 6295(o), 42 U.S.C. 6313(a)(6)(B), or any other applicable law. (42 U.S.C. 6295(p)(4)(C)) Receipt of an alternative joint recommendation may also trigger a DOE withdrawal of the direct final rule in the same manner. *Id*. After withdrawing a direct final rule, DOE must proceed with the notice of proposed rulemaking published simultaneously with the direct final rule and publish in the *Federal Register* the reasons why the direct final rule was withdrawn. *Id.*

Typical of other rulemakings, it is the substance, rather than the quantity, of comments that will ultimately determine whether a direct final rule will be withdrawn. To this end, the substance of any adverse comment(s) received will be weighed against the anticipated benefits of the jointly-submitted recommendations and the likelihood that further consideration of the comment(s) would change the results of the rulemaking. DOE notes that, to the extent an adverse comment had been previously raised and addressed in the rulemaking proceeding, such a submission will not typically provide a basis for withdrawal of a direct final rule.

B. Background

In the May 2020 Early Assessment Review RFI, DOE stated that it was initiating an early assessment review to determine whether any new or amended standards would satisfy the relevant requirements of EPCA for a new or amended energy conservation standard for electric motors and sought information related to that effort. Specifically, DOE sought 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 the foregoing. 85 FR 30878, 30879.

On March 2, 2022, DOE published the preliminary analysis for electric motors. 87 FR 11650 ("March 2022 Preliminary Analysis"). In conjunction with the March 2022 Preliminary Analysis, DOE published a technical support document ("March 2022 Prelim TSD") which presented the results of the in-depth technical analyses in the following areas: (1) Engineering; (2) markups to determine equipment price; (3) energy use; (4) life cycle cost ("LCC") and payback period ("PBP"); and (5) national impacts. The results presented included the current scope of electric motors regulated at 10 CFR 431.25, in addition to an expanded scope of motors, including electric motors above 500 horsepower, air-over electric motors, and small, non-small-electric-motor, electric motors ("SNEM"). *See* Chapter 2 of the March 2022 Prelim TSD.

By letter dated on November 15, 2022, DOE received a joint recommendation for energy conservation standards for electric motors ("November 2022 Joint Recommendation"). The November 2022 Joint Recommendation represented the motors industry, energy efficiency organizations and utilities (collectively, "the Electric Motors Working Group").[5] The November 2022 Joint Recommendation addressed energy conservation standards for medium electric motors that are 1-750 hp and polyphase, and air-over medium electric motors. On December 9, 2022, DOE received a supplemental letter to the November 2022 Joint Recommendation from the Electric Motors Working Group. The supplemental letter provided additional guidance on the recommended levels for open medium electric motors rated 100 hp to 250 hp, and a recommended compliance date for standards presented in the November 2022 Joint Recommendation. A summary

[5] The members of the Electric Motors Working Group included ACEEE, ASAP, NEMA, NRDC, NEEA, PG&E, SDG&E, and SCE.

of the specific recommendations contained in the November 2022 Joint Recommendation may be found in the direct final rule published elsewhere in this *Federal Register*.

After carefully considering the November 2022 Joint Recommendation and supplement for amending the energy conservation standards for electric motors submitted by the Electric Motors Working Group, DOE has determined that these recommendations are in accordance with the statutory requirements of 42 U.S.C. 6295(p)(4) for the issuance of a direct final rule.

More specifically, these recommendations comprise a statement submitted by interested persons who are fairly representative of relevant points of view on this matter. In appendix A to subpart C of 10 CFR part 430 ("appendix A"), DOE explained that to be "fairly representative of relevant points of view," the group submitting a joint statement must, where appropriate, include larger concerns and small business in the regulated industry/manufacturer community, energy advocates, energy utilities, consumers, and States. However, it will be necessary to evaluate the meaning of "fairly representative" on a case-by-case basis, subject to the circumstances of a particular rulemaking, to determine whether fewer or additional parties must be part of a joint statement in order to be "fairly representative of relevant points of view." Section 10 of appendix A. In reaching this determination, DOE took into consideration the fact that the Joint Recommendation was signed and submitted by a broad cross-section of interests, including a manufacturers' trade association, environmental and energy-efficiency advocacy organizations, and electric utility companies. NYSERDA, a state organization, also submitted a letter supporting the Joint Recommendation. DOE notes that these organizations include the relevant points of view specifically identified by Congress:

manufacturers of covered products, States, and efficiency advocates. (42 U.S.C. 6295(p)(4)(A))

DOE has evaluated the November 2022 Joint Recommendation and believes that it meets the EPCA requirements for issuance of a direct final rule. As a result, DOE published a direct final rule establishing energy conservation standards for electric motors elsewhere in this *Federal Register*. If DOE receives adverse comments that may provide a reasonable basis for withdrawal and withdraws the direct final rule, DOE will consider those comments and any other comments received in determining how to proceed with this proposed rule.

For further background information on these proposed standards and the supporting analyses, please see the direct final rule published elsewhere in this *Federal Register*. That document, and the accompanying technical support document ("TSD"), include additional discussion of the EPCA requirements for promulgation of energy conservation standards; the history of the standards rulemaking for electric motors; and information on the test procedures used to measure the energy efficiency of electric motors. Those documents also contain an in-depth discussion of the analyses conducted in support of this proposed rulemaking, the methodologies DOE used in conducting those analyses, and the analytical results.

III. Proposed Standards

A. Benefits and Burdens of TSLs Considered for Electric Motor Standards

Table III.1 and Table III.2 summarize the quantitative impacts estimated for each TSL for electric motors. The national impacts are measured over the lifetime of electric

motors purchased in the 30-year period that begins in the anticipated year of compliance with amended standards (2027–2056). The energy savings, emissions reductions, and value of emissions reductions refer to full-fuel-cycle results.

Table III.1 Summary of Analytical Results for Electric Motors TSLs: National Impacts

Category	TSL 1	TSL 2	TSL 3	TSL 4
Cumulative FFC National Energy Savings				
Quads	0.1	3.0	10.4	23.6
Cumulative FFC Emissions Reduction				
CO_2 (*million metric tons*)	4.42	91.69	319.24	725.80
CH_4 (*thousand tons*)	32.75	690.10	2,379.75	5,415.99
N_2O (*thousand tons*)	0.04	0.82	2.90	6.59
NO_X (*thousand tons*)	7.13	148.74	516.00	1,173.58
SO_2 (*thousand tons*)	1.71	35.12	122.75	278.95
Hg (*tons*)	0.01	0.23	0.80	1.82
Present Value of Benefits and Costs (*3% discount rate, billion 2021$*)				
Consumer Operating Cost Savings	0.51	8.82	34.86	73.26
Climate Benefits*	0.19	3.14	13.49	30.07
Health Benefits**	0.33	5.72	23.16	51.90
Total Benefits†	1.04	17.68	71.50	155.23
Consumer Incremental Product Costs‡	0.18	1.35	39.70	84.56
Consumer Net Benefits	0.33	7.47	-4.85	-11.30
Total Net Benefits	0.85	16.33	31.80	70.67
Present Value of Benefits and Costs (*7% discount rate, billion 2021$*)				
Consumer Operating Cost Savings	0.21	2.95	13.44	27.14
Climate Benefits*	0.19	3.14	13.49	30.07
Health Benefits**	0.12	1.76	8.19	18.13
Total Benefits†	0.53	7.85	35.11	75.34
Consumer Incremental Product Costs‡	0.10	0.72	21.03	44.80
Consumer Net Benefits	0.11	2.23	-7.60	-17.67
Total Net Benefits	0.43	7.13	14.08	30.54

Note: This table presents the costs and benefits associated with electric motors shipped in 2027−2056. These results include benefits to consumers which accrue after 2056 from the products shipped in 2027−2056.

* Climate benefits are calculated using four different estimates of the SC-CO_2, SC-CH_4 and SC-N_2O. Together, these represent the global SC-GHG. For presentational purposes of this table, the climate benefits associated with the average SC-GHG at a 3 percent discount rate are shown, but the Department does not have a single central SC-GHG point estimate. 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 presents monetized benefits where appropriate and permissible under law.

** Health benefits are calculated using benefit-per-ton values for NO_X and SO_2. DOE is currently only monetizing (for NO_X and SO_2) $PM_{2.5}$ precursor health benefits and (for NO_X) ozone precursor health benefits, but will continue to assess the ability to monetize other effects such as health benefits from reductions in direct $PM_{2.5}$ emissions. The health benefits are presented at real discount rates of 3 and 7 percent. *See* section IV.L of this document for more details.

† Total and net benefits include consumer, climate, and health benefits. For presentation purposes, total and net benefits for both the 3-percent and 7-percent cases are presented using the average SC-GHG with 3-percent discount rate, but the Department does not have a single central SC-GHG point estimate. DOE emphasizes the importance and value of considering the benefits calculated using all four SC-GHG estimates.
‡ Costs include incremental equipment costs as well as installation costs

Table III.2 Summary of Analytical Results for Electric Motor TSLs: Manufacturer and Consumer Impacts

Category	TSL 1	TSL 2	TSL 3	TSL 4
Manufacturer Impacts				
Industry NPV (*million 2021$*) (No-new-standards case INPV = 5,023)	4,896 – 4,899	4,690 – 4,720	3,659 – 4,681	(6,066) – (3,840)
Industry NPV (*% change*)	(2.5)	(6.6) – (6.0)	(27.2) – (6.8)	(220.8) – (176.4)
Consumer Average LCC Savings (2021$)				
RU1	N/A	N/A	-101.8	-276.4
RU2	N/A	N/A	-336.9	-309.4
RU3	N/A	N/A	-916.7	-1,439.6
RU4	N/A	567.1	567.1	-2,541.1
RU5	N/A	N/A	-945.5	-5,257.2
RU6	2,550.1	2,550.1	-2,287.8	-6,710.3
RU7	57.6	57.6	-39.2	-156.5
RU8	472.4	472.4	-160.8	-105.5
RU9*	-	-	-930.5	-1,795.0
RU10	608.8	930.7	930.7	-1,846.6
RU11	49.9	49.9	2.5	-153.2
Shipment-Weighted Average**	159.8	337.4	-196.2	-404.2
Consumer Simple PBP (years)				
RU1	N/A	N/A	16.7	20.3
RU2	N/A	N/A	15.4	11.9
RU3	N/A	N/A	30.2	20.6
RU4	N/A	4.1	4.1	18.1
RU5	N/A	N/A	11.8	17.7
RU6	3.7	3.7	9.6	12.6
RU7	4.0	4.0	6.5	9.0
RU8	1.6	1.6	5.9	6.1
RU9*	-	-	9.0	10.6
RU10	6.1	4.9	4.9	10.1
RU11	4.1	4.1	5.6	7.9
Shipment-Weighted Average**	3.8	3.9	15.6	16.3

Category	TSL 1	TSL 2	TSL 3	TSL 4
Percent of Consumers that Experience a Net Cost				
RU1	N/A	N/A	64.1%	95.9%
RU2	N/A	N/A	82.2%	75.0%
RU3	N/A	N/A	88.4%	90.5%
RU4	N/A	20.2%	20.2%	89.1%
RU5	N/A	N/A	66.9%	89.0%
RU6	2.1%	2.1%	58.3%	83.2%
RU7	10.3%	10.3%	62.9%	80.7%
RU8	0.9%	0.9%	73.9%	64.5%
RU9*	-	-	99.9%	96.4%
RU10	6.3%	11.7%	11.7%	79.0%
RU11	32.1%	32.1%	53.4%	74.5%
Shipment-Weighted Average**	10.9%	14.9%	70.6%	86.3%

The entry "N/A" means not applicable because there is no change in the standard at certain TSLs.
* No impact because there are no shipments below the efficiency level corresponding to TSL1 and TSL2 for RU9.
** Weighted by shares of each equipment class in total projected shipments in 2027 for impacted consumers.

DOE first considered TSL 4, which represents the max-tech efficiency levels. At this level, DOE expects that all equipment classes would require 35H210 silicon steel and die-cast copper rotors. DOE estimates that approximately 0.34 percent of annual shipments across all electric motor equipment classes currently meet the max-tech efficiencies required. TSL 4 would save an estimated 23.6 quads of energy, an amount DOE considers significant. Under TSL 4, the NPV of consumer benefit would be -$17.67 billion using a discount rate of 7 percent, and -$11.30 billion using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 4 are 725.80 Mt of CO_2, 278.95 thousand tons of SO_2, 1,173.58 thousand tons of NO_X, 1.82 tons of Hg, 5,415.99 thousand tons of CH_4, and 6.59 thousand tons of N_2O. The estimated monetary value of the climate benefits from reduced GHG emissions (associated with the average SC-GHG at a 3-percent discount rate) at TSL 4 is $30.07 billion. The estimated monetary value of

the health benefits from reduced SO_2 and NO_X emissions at TSL 4 is $18.13 billion using a 7-percent discount rate and $51.90 billion using a 3-percent discount rate.

Using a 7-percent discount rate for consumer benefits and costs, health benefits from reduced SO_2 and NO_X emissions, and the 3-percent discount rate case for climate benefits from reduced GHG emissions, the estimated total NPV at TSL 4 is $30.54 billion. Using a 3-percent discount rate for all benefits and costs, the estimated total NPV at TSL 4 is $70.67 billion.

At TSL 4, for the largest equipment class group and horsepower ranges, which are represented by RU1 and RU2, which together represent approximately 90 percent of annual shipments, there is a life cycle cost savings of -$276.4 and -$309.4 and a payback period of 20.3 years and 11.9 years, respectively. For these equipment classes, the fraction of customers experiencing a net LCC cost is 95.9 percent and 75.0 percent due to increases in total installed cost of $434.7 and $1,003.0, respectively. Overall, for the remaining equipment class groups and horsepower ranges, a majority of electric motor consumers (84.5 percent) would experience a net cost and the average LCC savings would be negative for all remaining equipment class groups and horsepower ranges.

At TSL 4, the projected change in INPV ranges from a decrease of $11,090 million to a decrease of $8,863 million, which corresponds to decreases of 220.8 percent and 176.4 percent, respectively. DOE estimates that industry must invest $13,516 million to comply with standards set at TSL 4. The significant increase in product and capital conversion costs is because DOE assumes that electric motor manufacturers will need to use die-cast copper rotors for most, if not all, electric motors manufactured to meet this TSL. This technology requires a significant level of investment because almost all

existing electric motor production machinery would need to be replaced or significantly modified. Based on the shipments analysis used in the NIA, DOE estimates that approximately 0.3 percent of all electric motor shipments will meet the efficiency levels required at TSL 4, in the no-new-standards case in 2027, the compliance year of new and amended standards.

The Secretary concludes that at TSL 4 for electric motors, the benefits of energy savings, emission reductions, and the estimated monetary value of the emissions reductions are outweighed by the negative NPV of consumer benefits, economic burden on many consumers, and the impacts on manufacturers, including the extremely large conversion costs, profit margin impacts that will result in a negative INPV, and the lack of manufacturers currently offering products meeting the efficiency levels required at this TSL. A majority of electric motor consumers (86.3 percent) would experience a net cost and the average LCC savings for each representative unit DOE examined is negative. In both manufacturer markup scenarios, INPV is negative at TSL 4, which implies that manufacturers would never recover the conversion costs they must make to produce electric motors at TSL 4. Consequently, the Secretary concludes that TSL 4 is not economically justified.

DOE then considered TSL 3, which represents a level corresponding to the IE4 level, except for AO-polyphase specialized frame size electric motors, where it corresponds to a lower level of efficiency (*i.e.*, NEMA Premium level). TSL 3 would save an estimated 10.4 quads of energy, an amount DOE considers significant. Under TSL 3, the NPV of consumer benefit would be -$7.60 billion using a discount rate of 7 percent, and -$4.85 billion using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 3 are 319.24 Mt of CO_2, 122.75 thousand tons of SO_2, 516.00 thousand tons of NO_X, 0.80 tons of Hg, 2,379.75 thousand tons of CH_4, and 2.90 thousand tons of N_2O. The estimated monetary value of the climate benefits from reduced GHG emissions (associated with the average SC-GHG at a 3-percent discount rate) at TSL 3 is $13.49 billion. The estimated monetary value of the health benefits from reduced SO_2 and NO_X emissions at TSL 3 is 8.19 billion using a 7-percent discount rate and $23.16 billion using a 3-percent discount rate.

Using a 7-percent discount rate for consumer benefits and costs, health benefits from reduced SO_2 and NO_X emissions, and the 3-percent discount rate case for climate benefits from reduced GHG emissions, the estimated total NPV at TSL 3 is $14.08 billion. Using a 3-percent discount rate for all benefits and costs, the estimated total NPV at TSL 3 is $31.80 billion.

At TSL 3, for the largest equipment class group and horsepower ranges, which are represented by RU1 and RU2, there is a life cycle cost savings of -$101.8 and -$336.9 and a payback period of 16.7 and 15.4, respectively.[6] For these equipment classes, the fraction of customers experiencing a net LCC cost is 64.1 percent and 82.2 percent due to increases in total installed cost of $171.3 and $690.5, respectively. Overall, for the remaining equipment class groups and horsepower ranges, a majority of electric motor consumers (55.5 percent) would experience a net cost and the shipments-weighted average LCC savings would be negative for all remaining equipment class groups and horsepower ranges.

[6] For RU1 and RU2, EL1 = EL2. See section IV.C.1.c. of the associated direct final rule published elsewhere in this *Federal Register*.

At TSL 3, the projected change in INPV ranges from a decrease of $1,364 million to a decrease of $342 million, which correspond to decreases of 27.2 percent and 6.8 percent, respectively. DOE estimates that industry must invest $1,618 million to comply with standards set at TSL 3. Based on the shipments analysis used in the NIA, DOE estimates that approximately 13.3 percent of all electric motor shipments will meet or exceed the efficiency levels required at TSL 3, in the no-new-standards case in 2027, the compliance year of new and amended standards.

The Secretary concludes that at TSL 3 for electric motors, the benefits of energy savings, emission reductions, and the estimated monetary value of the emissions reductions are outweighed by the negative NPV of consumer benefits, economic burden on many consumers, and the impacts on manufacturers, including the large conversion costs, profit margin impacts that could result in a large reduction in INPV, and the lack of manufacturers currently offering products meeting the efficiency levels required at this TSL. A majority of electric motor consumers (70.6 percent) would experience a net cost and the average LCC savings would be negative. The potential reduction in INPV could be as high as 27.2 percent. Consequently, the Secretary concludes that TSL 3 is not economically justified.

DOE then considered TSL 2, the standard levels recommended in the November 2022 Joint Recommendation by the Electric Motors Working Group. TSL 2 would also align with the EU Ecodesign Directive 2019/1781, which requires IE4 levels for 75-200kW motors.[7] TSL 2 would save an estimated 3.0 quads of energy, an amount DOE

[7] In terms of standardized horsepowers, this would correspond to 100-250hp when applying the from 10 CFR 431.25(k) (and new 10 CFR 431.25(q)).

considers significant. Under TSL 2, the NPV of consumer benefit would be $2.23 billion using a discount rate of 7 percent, and $7.47 billion using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 2 are 91.69 Mt of CO_2, 35.12 thousand tons of SO_2, 148.74 thousand tons of NO_X, 0.23 tons of Hg, 690.10 thousand tons of CH_4, and 0.82 thousand tons of N_2O. The estimated monetary value of the climate benefits from reduced GHG emissions (associated with the average SC-GHG at a 3-percent discount rate) at TSL 2 is $3.14 billion. The estimated monetary value of the health benefits from reduced SO_2 and NO_X emissions at TSL 2 is $1.76 billion using a 7-percent discount rate and $5.72 billion using a 3-percent discount rate.

Using a 7-percent discount rate for consumer benefits and costs, health benefits from reduced SO_2 and NO_X emissions, and the 3-percent discount rate case for climate benefits from reduced GHG emissions, the estimated total NPV at TSL 2 is $7.13 billion. Using a 3-percent discount rate for all benefits and costs, the estimated total NPV at TSL 2 is $16.33 billion.

At TSL 2, for the largest equipment class group and horsepower ranges, which are represented by RU1 and RU2, there would be no changes in the standards. Overall, for the remaining equipment class groups and horsepower ranges, 14.9 percent of electric motor consumers would experience a net cost and the shipments-weighted average LCC savings would be positive for all remaining equipment class groups and horsepower ranges.

At TSL 2, the projected change in INPV ranges from a decrease of $333 million to a decrease of $303 million, which correspond to decreases of 6.6 percent and 6.0 percent, respectively. DOE estimates that industry must invest $468 million to comply

with standards set at TSL 2. Based on the shipments analysis used in the NIA, DOE estimates that approximately 96.2 percent of all electric motor shipments will meet or exceed the efficiency levels required at TSL 2, in the no-new-standards case in 2027, the compliance year of new and amended standards.

After considering the analysis and weighing the benefits and burdens, the Secretary concludes that a standard set at TSL 2 for electric motors would be economically justified. At this TSL, the average LCC savings is positive. Only an estimated 14.9 percent of electric motor consumers experience a net cost. The FFC national energy savings are significant and the NPV of consumer benefits is positive using both a 3-percent and 7-percent discount rate. Notably, the benefits to consumers vastly outweigh the cost to manufacturers. Notably, at TSL 2, the NPV of consumer benefits, even measured at the more conservative discount rate of 7 percent is over 6 times higher than the maximum estimated manufacturers' loss in INPV. The standard levels at TSL 2 are economically justified even without weighing the estimated monetary value of emissions reductions. When those emissions reductions are included – representing $3.14 billion in climate benefits (associated with the average SC-GHG at a 3-percent discount rate), and $5.72 billion (using a 3-percent discount rate) or $1.76 billion (using a 7-percent discount rate) in health benefits – the rationale becomes stronger still.

As stated, DOE conducts the walk-down analysis to determine the TSL that represents the maximum improvement in energy efficiency that is technologically feasible and economically justified as required under EPCA. The walk-down is not a comparative analysis, as a comparative analysis would result in the maximization of net benefits instead of energy savings that are technologically feasible and economically

justified, which would be contrary to the statute. 86 FR 70892, 70908. Although DOE has not conducted a comparative analysis to select the energy conservation standards, DOE notes that as compared to TSL 3 and TSL 4, TSL 2 has higher average LCC savings for consumers, significantly smaller percentages of electric motor consumers experiencing a net cost, a lower maximum decrease in INPV, and lower manufacturer conversion costs.

Although DOE considered amended standard levels for electric motors by grouping the efficiency levels for each equipment class groups and horsepower ranges into TSLs, DOE evaluates all analyzed efficiency levels in its analysis. For all equipment class groups and horsepower ranges, TSL 2 represents the maximum energy savings that does not result in the majority of consumers experiencing a net LCC cost. The ELs at the proposed TSL result in average positive LCC savings for all equipment class groups and horsepower ranges, significantly reduce the number of consumers experiencing a net cost, and reduce the decrease in INPV and conversion costs to the point where DOE has concluded they are economically justified, as discussed for TSL 2 in the preceding paragraphs.

Therefore, based on the previous considerations, DOE proposes to adopt the energy conservation standards for electric motors at TSL 2. The proposed amended energy conservation standards for electric motors, which are expressed as full-load efficiency, are shown in Table I.1, Table I.2, and Table I.3.

B. Annualized Benefits and Costs of the Proposed Standards

The benefits and costs of the proposed standards can also be expressed in terms of annualized values. The annualized net benefit is (1) the annualized national economic

value (expressed in 2021$) of the benefits from operating products that meet the proposed standards (consisting primarily of operating cost savings from using less energy, minus increases in product purchase costs, and (2) the annualized monetary value of the climate and health benefits from emission reductions.

Table III.3 shows the annualized values for electric motors under TSL 2, expressed in 2021$. The results under the primary estimate are as follows.

Using a 7-percent discount rate for consumer benefits and costs and NOx and SO_2 reduction benefits, and a 3-percent discount rate case for GHG social costs, the estimated cost of the standards for electric motors is $62.1 million per year in increased equipment costs, while the estimated annual benefits are $254.8 million from reduced equipment operating costs, $164.8 million from GHG reductions, and $151.4 million from reduced NO_X and SO_2 emissions. In this case, the net benefit amounts to $508.9 million per year.

Using a 3-percent discount rate for all benefits and costs, the estimated cost of the standards for electric motors is $71.0 million per year in increased equipment costs, while the estimated annual benefits are $463.6 million in reduced operating costs, $164.8 million from GHG reductions, and $300.7 million from reduced NO_X and SO_2 emissions. In this case, the net benefit amounts to $858.2 million per year.

Table III.3 Annualized Benefits and Costs of Proposed Energy Conservation Standards for Electric Motors (TSL 2)

	Million 2021$/year		
	Primary Estimate	Low-Net-Benefits Estimate	High-Net-Benefits Estimate
3% discount rate			
Consumer Operating Cost Savings	463.6	405.1	542.9
Climate Benefits*	164.8	148.0	186.5
Health Benefits**	300.7	269.5	341.0
Total Benefits†	929.1	822.5	1070.4
Consumer Incremental Equipment Costs‡	71.0	73.7	73.0
Net Benefits	858.2	748.8	997.4
7% discount rate			
Consumer Operating Cost Savings	254.8	225.3	293.6
Climate Benefits* (3% discount rate)	164.8	148.0	186.5
Health Benefits**	151.4	137.1	169.5
Total Benefits†	571.0	510.4	649.6
Consumer Incremental Product Costs	62.1	63.8	63.9
Net Benefits	508.9	446.6	585.6

Note: This table presents the costs and benefits associated with electric motors shipped in 2027−2056. These results include benefits to consumers which accrue after 2056 from the products shipped in 2027−2056. The Primary, Low Net Benefits, and High Net Benefits Estimates utilize projections of energy prices from the *AEO2022* Reference case, Low Economic Growth case, and High Economic Growth case, respectively. In addition, incremental equipment costs reflect a constant rate in the Primary Estimate, an increasing rate in the Low Net Benefits Estimate, and a declining rate in the High Net Benefits Estimate. The methods used to derive projected price trends are explained in section IV.H.3 of this document. Note that the Benefits and Costs may not sum to the Net Benefits due to rounding.

* Climate benefits are calculated using four different estimates of the global SC-GHG (see section IV.L of this document). For presentational purposes of this table, the climate benefits associated with the average SC-GHG at a 3 percent discount rate are shown, but the Department does not have a single central SC-GHG point estimate, and it emphasizes the importance and value of considering the benefits calculated using all four SC-GHG estimates. 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 presents monetized benefits where appropriate and permissible under law.

** Health benefits are calculated using benefit-per-ton values for NO_X and SO_2. DOE is currently only monetizing (for SO_2 and NO_X) $PM_{2.5}$ precursor health benefits and (for NO_X) ozone precursor health benefits, but will continue to assess the ability to monetize other effects such as health benefits from reductions in direct $PM_{2.5}$ emissions. The health benefits are presented at real discount rates of 3 and 7 percent. See section IV.L of this document for more details.

† Total benefits for both the 3-percent and 7-percent cases are presented using the average SC-GHG with 3-percent discount rate, but the Department does not have a single central SC-GHG point estimate.

‡ Costs include incremental equipment costs as well as installation costs

IV. Procedural Issues and Regulatory Review

The regulatory reviews conducted for this proposed rule, except for the Regulatory Flexibility Act discussed in section IV.A, are identical to those conducted for the direct final rule published elsewhere in this *Federal Register*. Please see the direct final rule for further details.

A. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.) requires preparation of an initial regulatory flexibility analysis ("IRFA") and a final regulatory flexibility analysis ("FRFA") for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by E.O. 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (Aug. 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website (*www.energy.gov/gc/office-general-counsel*). DOE has prepared the following IRFA for the products that are the subject of this proposed rulemaking.

For manufacturers of electric motors, the SBA has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the statute. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. (*See* 13 CFR part 121.) The size standards are listed by North American Industry Classification System ("NAICS") code and industry description and are available at *www.sba.gov/document/support-table-size-standards*. Manufacturing of electric motors is classified under NAICS 335312,

"Motor and Generator Manufacturing." The SBA sets a threshold of 1,250 employees or fewer for an entity to be considered as a small business for this category.

1. Description of Reasons Why Action Is Being Considered

EPCA requires that, not later than 6 years after the issuance of any final rule establishing or amending a standard, DOE must publish either a notice 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. 6316(e)(1); 42 U.S.C. 6295(m)(1)) Additionally, under the authority provided by 42 U.S.C. 6295(p)(4), DOE is issuing a direct final rule establishing energy conservation standards for electric motors These standard levels were submitted jointly to DOE on November 15, 2022, by groups representing manufacturers, energy and environmental advocates, and consumer groups (the Electric Motors Working Group).[8] This collective set of comments, the November 2022 Joint Recommendation, recommends specific energy conservation standards for electric motors that DOE has determined satisfy the EPCA requirements in 42 U.S.C. 6295(o).

2. Objectives of, and Legal Basis for, Rule

EPCA authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. Title III, Part C[9] of EPCA added by Pub. L. 95-619, Title IV, section 441(a) (42 U.S.C. 6311-6317, as codified), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a

[8] The Electric Motors working Group includes the American Council for an Energy-Efficient Economy ("ACEEE"), Appliance Standards Awareness Project ("ASAP"), National Electrical Manufacturers Association ("NEMA"), Natural Resources Defense Council ("NRDC"), Northwest Energy Efficiency Alliance ("NEEA"), Pacific Gas & Electric Company ("PG&E"), San Diego Gas & Electric ("SDG&E"), and Southern California Edison ("SCE"). In a letter comment submitted December 12, 2022, the New York State Energy Research and Development Authority ("NYSERDA") expressed its support of the November 2022 Joint Recommendation and urged DOE to implement it in a timely manner.

[9] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

variety of provisions designed to improve the energy efficiency of certain types of industrial equipment, including electric motors, the subject of this proposed rule. (42 U.S.C. 6311(1)(A)). DOE has previously established energy conservation standards for electric motors at 10 CFR 431.25. EPCA further provides that, not later than 6 years after the issuance of any final rule establishing or amending a standard, DOE must publish either a notice of determination that standards for the product do not need to be amended, or a notice of proposed rulemaking including new proposed energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(1)) DOE must follow specific statutory criteria for prescribing new or amended standards for covered equipment, including electric motors. Any new or amended standard for a covered equipment must be designed to achieve the maximum improvement in energy efficiency that the Secretary of Energy determines is technologically feasible and economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(A) and 42 U.S.C. 6295(o)(3)(B)). As noted previously, DOE has the authority to issue a final rule (*i.e.*, a "direct final rule") establishing an energy conservation standard on receipt of a statement submitted jointly by interested persons that are fairly representative of relevant points of view (including representatives of manufacturers of covered products, States, and efficiency advocates), as determined by the Secretary, that contains recommendations with respect to an energy or water conservation standard that are in accordance with the provisions of 42 U.S.C. 6295(o). (42 U.S.C. 6295(p)(4))

3. Description on Estimated Number of Small Entities Regulated

To estimate the number of companies that could be small business manufacturers of electric motors covered by this proposed rulemaking, DOE conducted a market survey using publicly available information. DOE's research involved DOE's publicly available

Compliance Certification Database ("CCD"), industry trade association membership directories (including NEMA), and information from previous rulemakings. DOE also asked stakeholders and industry representatives if they were aware of any other small manufacturers during manufacturer interviews and DOE working groups. DOE used information from these sources to create a list of companies that potentially manufacture electric motors covered by this proposed rulemaking. As necessary, DOE contacted companies to determine whether they met the SBA's definition of a small business manufacturer. DOE screened out companies that do not offer equipment covered by this rulemaking, do not meet the definition of a ''small business,'' or are foreign owned and operated.

DOE initially identified approximately 74 unique potential manufacturers of electric motors sold in the U.S that are covered by this proposed rulemaking. DOE screened out companies that had more than 1,250 employees or companies that were completely foreign owned and operated. Of the 74 manufacturers that potentially manufacture electric motors covered by this proposed rulemaking, DOE identified 11 companies that meet SBA's definition of a small business.

4. Description and Estimate of Compliance Requirements Including Differences in Cost, if Any, for Different Groups of Small Entities

Six major manufacturers supply approximately 90 percent of the market for electric motors covered by this proposed rulemaking. None of the major electric motor manufacturers covered by this proposed rulemaking are a small business. DOE is adopting new energy conservation standards for some AO electric motors and NEMA Design A and B electric motors between 500 hp and 75 hp. Additionally, DOE is amending energy conservation standards for NEMA Design A and B electric motors

between 100 hp and 250 hp. Based on a review on the 11 small businesses' equipment offerings online, DOE was not able to identify any small business electric motor manufacturer that manufactures AO electric motors covered by this proposed rulemaking. Therefore, the remainder of the discussion in this section focuses on NEMA Design A and B electric motors between 100 hp and 250 hp and NEMA Design A and B electric motors between 500 hp and 750 hp that are covered by this proposed rulemaking.

Most of the identified small businesses primarily focus on selling application specific motors to OEMs (which are then embedded in the OEM's machinery). DOE estimates that approximately 97 percent of NEMA Design A and B electric motor sales covered by this proposed rulemaking are between 1-100 hp or 250-500 hp. DOE is not proposing to amend energy conservation standards for NEMA Design A and B electric motors between these horsepower ranges. Therefore, the majority of the NEMA Design A and B electric motors that are manufactured by the identified small businesses will not need to be remodeled in order to meet the proposed energy conservation standards.

The primary value added by these small businesses is creating electric motors that fit the application specific purpose that the OEMs require. This includes combining an electric motor with specific mechanic couplings, weatherproofing, or controls to suit the OEM's needs. Most small businesses manufacturer the motor housing and couplings, but do not manufacture the rotors and stators used in the electric motors they sell. While these small businesses may have to create new electric motor housings and/or couplings if the frame size or stack length of an electric motor changes in response to energy conservation standards, DOE was not able to identify any small businesses that own their own lamination dies sets and winding machines that are used to manufacture electric motor rotors and stators.

The primary investment that electric motor manufacturers will have to make is to upgrade or replace lamination die sets and winding machines and to have engineers develop equipment designs to create more efficient electric motors. These investments (both capital and product conversion costs) would only be for electric motor manufacturers that manufacture electric motor rotors and stators. Electric motor manufacturers that do not manufacture the rotors and stators of an electric motor and instead purchase these components from other electric motor manufacturers would not need to purchase the machinery necessary to manufacture these components (*i.e.,* would not need to purchase costly lamination dies sets and winding machines) nor would they need to spend R&D efforts to develop electric motor designs to meet energy conservation standards. Instead, these small manufacturers might have to create new moldings for larger electric motor housings (if the size of the motor core increases in response to energy conservation standards).

DOE estimates the average small business would have to redesign four electric motor housings. DOE estimates this will cost approximately $50,000 in molding equipment per electric motor housing; $35,314 in engineering design effort per electric motor housing;[10] and $10,000 in testing costs per electric motor housing. Based on these estimates, each electric motor housing that will need to be redesigned would cost small businesses approximately $95,314, or $381,254 to redesign four electric motor housings per small business.

[10] DOE estimated that it would take approximately three months of engineering time to redesign each electric motor housing. Based on data from BLS, the mean hourly wage of an electrical engineer is $51.87 (*www.bls.gov/oes/current/oes172071.htm*) and wages comprise 70.5 percent of an employee's total compensation (*www.bls.gov/news.release/archives/ecec_12152022.pdf*).
$51.87 (hourly wage) ÷ 0.705 (wage as a percentage of total compensation) = $73.57 (fully burdened hourly labor rate)
$73.57 x 8 (hours in a workday) x 20 (working days in a month) X 3 (months) = $35,314

DOE displays in Table VI-1 the estimated average conversion costs per small business compared to the annual revenue for each small business. DOE used D&B Hoovers[11] to estimate the annual revenue for each small business. Manufacturers will have 4 years between publication of the direct final rule and compliance with the energy conservation standards. Therefore, DOE presents the estimated conversion costs and testing costs as a percent of the estimated 4 years of annual revenue for each small business.

Table VI-1 Estimated Conversion Costs and Annual Revenue for each Small Business

Manufacturer	Total Conversion and Testing Costs	Annual Revenue	4-Years of Annual Revenue	Conversion Costs as a % of 4-Years of Annual Revenue
Small Business 1	$250,000	$78,000,000	$312,000,000	0.1%
Small Business 2	$250,000	$60,000,000	$240,000,000	0.1%
Small Business 3	$250,000	$30,000,000	$120,000,000	0.2%
Small Business 4	$250,000	$29,000,000	$116,000,000	0.2%
Small Business 5	$250,000	$25,000,000	$100,000,000	0.3%
Small Business 6	$250,000	$23,000,000	$92,000,000	0.3%
Small Business 7	$250,000	$11,000,000	$44,000,000	0.6%
Small Business 8	$250,000	$10,000,000	$40,000,000	0.6%
Small Business 9	$250,000	$10,000,000	$40,000,000	0.6%
Small Business 10	$250,000	$4,600,000	$18,400,000	1.4%
Small Business 11	$250,000	$3,300,000	$13,200,000	1.9%
Average Small Business	**$2,750,000**	**$283,900,000**	**$1,135,600,000**	**0.2%**

5. Duplication, Overlap, and Conflict with Other Rules and Regulations

DOE is not aware of any rules or regulations that duplicate, overlap, or conflict with the rule being considered.

6. Significant Alternatives to the Rule

The discussion in the previous section analyzes impacts on small businesses that would result from DOE's proposal, represented by TSL 2, as recommended in the

[11] app.avention.com

November 2022 Joint Recommendation. In reviewing alternatives to the rule, DOE examined energy conservation standards set at lower efficiency levels. While TSL 1 would reduce the impacts on small business manufacturers, it would come at the expense of a reduction in energy savings. TSL 1 achieves 97 percent lower energy savings and 96 percent lower consumer NPV compared to the energy savings and consumer NPV at TSL 2.

Based on the presented discussion, establishing standards at TSL 2 balances the benefits of the energy savings at TSL 2 with the potential burdens placed on electric motors manufacturers, including small business manufacturers. Accordingly, DOE does not adopt one of the other TSLs considered in the analysis.

Additional compliance flexibilities may be available through other means. Manufacturers subject to DOE's energy efficiency standards may apply to DOE's Office of Hearings and Appeals for exception relief under certain circumstances. Manufacturers should refer to 10 CFR part 430, subpart E, and 10 CFR part 1003 for additional details.

V. Public Participation

A. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule until the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments, data, and other information using any of the methods described in the **ADDRESSES** section at the beginning of this document.

Submitting comments via *www.regulations.gov*. The *www.regulations.gov* webpage will require you to provide your name and contact information. Your contact

information will be viewable to DOE Building Technologies 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 itself 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. Otherwise, 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 in 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, in which case it is not necessary to submit printed copies. No telefacsimiles ("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, that are written in English, and that are 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 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).

B. Public Meeting

If DOE withdraws the direct final rule published elsewhere in this *Federal Register* pursuant to 42 U.S.C. 6295(p)(4)(C), DOE will hold a public meeting to allow for additional comment on this proposed rule. DOE will publish notice of any meeting in the *Federal Register*.

NEMA MG 1-2016 was previously approved for incorporation by reference in the section where it appears in this proposed rule and no change to the standard is made.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notice of proposed rulemaking.

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on May 1, 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 May 5, 2023.

_____

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

For the reasons stated in the preamble, DOE proposes to amend part 431 of chapter II of title 10 of the Code of Federal Regulations, as set forth below:

PART 431 - ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

1. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

2. Amend §431.12 by adding, in alphabetical order, definitions for "Specialized frame size" and "Standard frame size," to read as follows:

§431.12 Definitions.

* * * * *

Specialized frame size means an electric motor frame size for which the rated output power of the motor exceeds the motor frame size limits specified for standard frame size. Specialized frame sizes have maximum diameters corresponding to the following NEMA Frame Sizes:

Motor Horsepower/ Standard Kilowatt Equivalent	Maximum NEMA Frame Diameters							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	48	--	48	48	48	48	140	140
1.5/1.1	48	48	48	48	140	140	140	140
2/1.5	48	48	48	48	140	140	180	180
3/2.2	140	48	140	140	180	180	180	180
5/3.7	140	140	140	140	180	180	210	210
7.5/5.5	180	140	180	180	210	210	210	210
10/7.5	180	180	180	180	210	210	--	--
15/11	210	180	210	210	--	--	--	--
20/15	210	210	210	210	--	--	--	--

Standard frame size means a motor frame size that aligns with the specifications in NEMA MG 1-2016, section 13.2 for open motors, and NEMA MG 1-2016, section 13.3 for enclosed motors (incorporated by reference, see §431.15).

* * * * *

3. Amend §431.25 by:

a. Revising paragraph (h) introductory text; and

b. Adding paragraphs (m) through (r).

The revision and additions read as follows:

§431.25 Energy conservation standards and effective dates.

* * * * *

(h) Each NEMA Design A motor, NEMA Design B motor, and IEC Design N (including NE, NEY, or NY variants) motor that is an electric motor meeting the criteria in paragraph (g) of this section and with a power rating from 1 horsepower through 500 horsepower, but excluding fire pump electric motors, manufactured (alone or as a component of another piece of equipment) on or after June 1, 2016, but before [*date 4 years after date of publication of final rule in the federal register*], shall have a nominal full-load efficiency of not less than the following:

* * * * *

(m) The standards in tables 8 through 10 of this section apply only to electric motors, including partial electric motors, that satisfy the following criteria:

(1) Are single-speed, induction motors;

(2) Are rated for continuous duty (MG 1) operation or for duty type S1 (IEC);

(3) Contain a squirrel-cage (MG 1) or cage (IEC) rotor;

(4) Operate on polyphase alternating current 60-hertz sinusoidal line power;

(5) Are rated 600 volts or less;

(6) Have a 2-, 4-, 6-, or 8-pole configuration,

(7) Are built in a three-digit or four-digit NEMA frame size (or IEC metric equivalent), including those designs between two consecutive NEMA frame sizes (or IEC metric equivalent), or an enclosed 56 NEMA frame size (or IEC metric equivalent),

(8) Produce at least one horsepower (0.746 kW) but not greater than 750 horsepower (559 kW), and

(9) Meet all of the performance requirements of one of the following motor types: A NEMA Design A, B, or C motor or an IEC Design N, NE, NEY, NY or H, HE, HEY, HY motor.

(n) Starting on [*date 4 years after date of publication of final rule in the federal register*], each NEMA Design A motor, NEMA Design B motor, and IEC Design N (including NE, NEY, or NY variants) motor that is an electric motor meeting the criteria in paragraph (m) of this section and with a power rating from 1 horsepower through 750 horsepower, but excluding fire pump electric motors and air-over electric motors, manufactured (alone or as a component of another piece of equipment) shall have a nominal full-load efficiency of not less than the following:

TABLE 8 TO PARAGRAPH (N)—NOMINAL FULL-LOAD EFFICIENCIES OF NEMA DESIGN A, NEMA DESIGN B AND IEC DESIGN N, NE, NEY OR NY MOTORS (EXCLUDING FIRE PUMP ELECTRIC MOTORS AND AIR-OVER ELECTRIC MOTORS) AT 60 HZ

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20/15	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0

25/18.5	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30/22	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40/30	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50/37	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60/45	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75/55	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100/75	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125/90	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150/110	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200/150	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250/186	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4
300/224	95.8	95.4	96.2	95.8	95.8	95.8	--	--
350/261	95.8	95.4	96.2	95.8	95.8	95.8	--	--
400/298	95.8	95.8	96.2	95.8	--	--	--	--
450/336	95.8	96.2	96.2	96.2	--	--	--	--
500/373	95.8	96.2	96.2	96.2	--	--	--	--
550/410	95.8	96.2	96.2	96.2	--	--	--	--
600/447	95.8	96.2	96.2	96.2	--	--	--	--
650/485	95.8	96.2	96.2	96.2	--	--	--	--
700/522	95.8	96.2	96.2	96.2	--	--	--	--
750/559	95.8	96.2	96.2	96.2	--	--	--	--

(o) Starting on [*date 4 years after date of publication of final rule in the federal register*], each NEMA Design A motor, NEMA Design B motor, and IEC Design N (including NE, NEY, or NY variants) motor that is an air-over electric motor meeting the criteria in paragraph (m) of this section and with a power rating from 1 horsepower through 250 horsepower, built in a standard frame size, but excluding fire pump electric motors, manufactured (alone or as a component of another piece of equipment) shall have a nominal full-load efficiency of not less than the following:

TABLE 9 TO PARAGRAPH (O)—NOMINAL FULL-LOAD EFFICIENCIES OF NEMA DESIGN A, NEMA DESIGN B AND IEC DESIGN N, NE, NEY OR NY STANDARD FRAME SIZE AIR-OVER ELECTRIC MOTORS (EXCLUDING FIRE PUMP ELECTRIC MOTORS) AT 60 HZ

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2

20/15	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25/18.5	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30/22	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40/30	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50/37	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60/45	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75/55	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100/75	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125/90	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150/110	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200/150	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250/186	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4

(p) Starting on [*date 4 years after date of publication of final rule in the federal register*], each NEMA Design A motor, NEMA Design B motor, and IEC Design N (including NE, NEY, or NY variants) motor that is an air-over electric motor meeting the criteria in paragraph (m) of this section and with a power rating from 1 horsepower through 20 horsepower, built in a specialized frame size, but excluding fire pump electric motors, manufactured (alone or as a component of another piece of equipment) shall have a nominal full-load efficiency of not less than the following:

TABLE 10 TO PARAGRAPH (P)—NOMINAL FULL-LOAD EFFICIENCIES OF NEMA DESIGN A, NEMA DESIGN B AND IEC DESIGN N, NE, NEY OR NY SPECIALIZED FRAME SIZE AIR-OVER ELECTRIC MOTORS (EXCLUDING FIRE PUMP ELECTRIC MOTORS) AT 60 HZ

Motor Horsepower/ Standard Kilowatt Equivalent	Nominal Full-Load Efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	74.0	--	82.5	82.5	80.0	80.0	74.0	74.0
1.5/1.1	82.5	82.5	84.0	84.0	85.5	84.0	77.0	75.5
2/1.5	84.0	84.0	84.0	84.0	86.5	85.5	82.5	85.5
3/2.2	85.5	84.0	87.5	86.5	87.5	86.5	84.0	86.5
5/3.7	87.5	85.5	87.5	87.5	87.5	87.5	85.5	87.5
7.5/5.5	88.5	87.5	89.5	88.5	89.5	88.5	85.5	88.5
10/7.5	89.5	88.5	89.5	89.5	89.5	90.2	--	--
15/11	90.2	89.5	91.0	91.0	--	--	--	--
20/15	90.2	90.2	91.0	91.0	--	--	--	--

(q) For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two

kilowatt ratings listed in any table of energy conservation standards in paragraphs (n) through (p) through of this section, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

(1) A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers;

(2) A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers; or

(3) A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula 1 kilowatt = ($^{1}/_{0.746}$) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraphs (q)(1) or (2) of this section, whichever applies.

(r) The standards in tables 8 through 10 of this section do not apply to the following electric motors exempted by the Secretary, or any additional electric motors that the Secretary may exempt:

(1) Component sets of an electric motor;

(2) Liquid-cooled electric motors;

(3) Submersible electric motors; and

(4) Inverter-only electric motors.

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