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[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 431

[Docket Numbers EERE–2013–BT–STD–0007 and EERE–2013–BT–STD–0021]

RIN 1904–AC95 and 1904–AD11

Energy Conservation Program for Certain Industrial Equipment: Energy Conservation Standards for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment and Commercial Warm Air Furnaces

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

ACTION: Supplemental notice of proposed rulemaking.

SUMMARY: The Energy Policy and Conservation Act of 1975, as amended (EPCA), prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including small, large, and very large air-cooled commercial package air conditioning and heating equipment and commercial warm air furnaces. EPCA also requires that the U.S. Department of Energy (DOE) periodically review and consider amending its standards for specified categories of industrial equipment, including commercial heating and air-conditioning equipment, in order to

determine whether more-stringent, amended standards would be technologically feasible and economically justified, and save a significant additional amount of energy. In this notice, DOE proposes to amend the energy conservation standards for both small, large, and very large air-cooled commercial package air conditioning and heating equipment and commercial warm air furnaces 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: DOE will accept comments, data, and information regarding the proposed standards 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 before [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**].

ADDRESSES: Instructions: Any comments submitted must identify the proposed rule for Energy Conservation Standards for small, large, and very large air-cooled commercial package air conditioning and heating equipment (CUACs and CUHPs) and commercial warm air furnaces (CWAFs), and provide docket number EERE–2013–BT–STD–0007

and/or regulatory information number (RIN) 1904–AC95 for CUACs and CUHPs and EERE–2013–BT–STD–0021 and/or RIN 1904–AD11 for CWAFs. Comments may be submitted using any of the following methods:

1. Federal eRulemaking Portal: www.regulations.gov. Follow the instructions for submitting comments.
2. E-mail: For CUACs and CUHPs: CommPkgACHP2013STD0007@ee.doe.gov. For CWAFs: CommWarmAirFurn2013STD0021@ee.doe.gov. Include the docket number and/or RIN for each equipment category in the subject line of the message. Submit electronic comments in WordPerfect, Microsoft Word, PDF, or ASCII file format, and avoid the use of special characters or any form of encryption.
3. Postal Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.
4. Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., Room 6094, Washington, DC, 20024. Telephone: (202) 586-2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimilies (faxes) will be accepted.

For detailed instructions on submitting comments and additional information on the rulemaking process, see section III of this document ("Public Participation").

Written comments regarding the burden-hour estimates or other aspects of the collection-of-information requirements contained in this proposed rule may be submitted to Office of Energy Efficiency and Renewable Energy through the methods listed above and by e-mail to Chad_S_Whiteman@omb.eop.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@atr.usdoj.gov before [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**]. Please indicate in the "Subject" line of your e-mail the title and Docket Number of this rulemaking notice.

Docket: The dockets, which include Federal Register notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials, is available for review at www.regulations.gov. All documents in the dockets 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.

A link to the docket web page for small, large, and very large air-cooled commercial package air conditioning and heating equipment can be found at: www.regulations.gov/#!docketDetail;D=EERE-2013-BT-STD-0007. A link to the docket web page for commercial warm air furnaces can be found at: www.regulations.gov/#!docketDetail;D=EERE-2013-BT-STD-0021.The www.regulations.gov web page will contain instructions on how to access all documents, including public comments, in the docket.

For further information on how to review the dockets, please contact Ms. Brenda Edwards at (202) 586-2945 or by email: Brenda.Edwards@ee.doe.gov.

FOR FURTHER INFORMATION CONTACT: Mr. John Cymbalsky, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies, EE-5B, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 286-1692. E-mail: John.Cymbalsky@ee.doe.gov.

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

SUPPLEMENTARY INFORMATION:

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I. Introduction and Authority

Title III, Part C of the Energy Policy and Conservation Act of 1975 ("EPCA" or, in context, "the Act"), Public Law 94–163 (December 22, 1975), coupled with Title IV of the National Energy Conservation Policy Act, Public Law 95–619 (November 9, 1978), (collectively codified at 42 U.S.C. 6311–6317), established the Energy Conservation Program for Certain Industrial Equipment, which includes provisions covering the equipment addressed by this notice.[1] In general, this program addresses the energy efficiency of certain types of commercial and industrial equipment. Relevant provisions of the Act specifically include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316).

[1] All references to EPCA in this document refer to the statute as amended through the Energy Efficiency Improvement Act of 2015, Pub. L. 114-11 (April 30, 2015).

Section 342(a) of EPCA, which was added as part of the Energy Policy Act of 1992, Public Law 102-486 (October 24, 1992) ("EPAct 1992"), introduced new provisions regarding DOE's authority to regulate certain commercial and industrial equipment. Among the equipment EPAct 1992 required DOE to regulate were small and large air-cooled commercial package air conditioning and heating equipment, along with commercial warm air furnaces ("CWAFs"). See EPAct 1992, sec. 122 (codified as amended at 42 U.S.C. 6313(a)). As part of these changes, Congress specified energy conservation standards for this equipment to meet. See id. Later, the Energy Policy Act of 2005, Public Law 109-58 (August 8, 2005) ("EPACT 2005"), further amended DOE's authority to include very large air-cooled commercial package air conditioning and heating equipment and added standards for this equipment to meet as well. See EPACT 2005, sec. 136 (codified as amended at 42 U.S.C. 6313(a)). (Small, large, and very large, air-cooled commercial package air conditioning and heating equipment are also known generally as air-cooled commercial unitary air conditioners and heat pumps ("CUACs" and "CUHPs"). Congress established standards for CUACs/CUHPs that have a rated capacity between 65,000 British thermal units per hour (Btu/h) and 760,000 Btu/h. Similarly, for CWAFs, Congress established standards for equipment that (1) have a rated capacity (rated maximum input[2]) greater than or equal to 225,000 Btu/h, (2) can be gas-fired or oil-fired, and (3) are designed to heat commercial and industrial buildings. See 42 U.S.C. 6313(a)(4).

[2] "Rated maximum input" means the maximum gas-burning capacity of a CWAF in Btus per hour, as specified by the manufacturer.

Collectively, CUACs/CUHPs and CWAFs are designed to heat and cool commercial buildings and are often located on a building's rooftop.

Section 5(b) of the American Energy Manufacturing Technical Corrections Act of 2012 (Public Law 112-210 (December 18, 2012) ("AEMTCA")) amended Section 342(a)(6) of EPCA. Among other things, AEMTCA modified the manner in which DOE must amend the energy efficiency standards for certain types of commercial and industrial equipment. First, AEMTCA added a review requirement that is triggered when ASHRAE adopts a design requirement, even if the standard level remains unchanged. (42 U.S.C. 6313(a)(6)(A)(i)) Second, AEMTCA added a requirement that DOE conduct an evaluation of each class of covered equipment to determine whether standards need to be amended for any covered equipment as to which more than 6 years had elapsed since the issuance of the most recent final rule establishing or amending a standard for the equipment as of the date of AEMTCA's enactment, December 18, 2012. (42 U.S.C. 6313(a)(6)(C)(vi)). DOE is typically obligated either to adopt those standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers ("ASHRAE") – or to adopt levels more stringent than the ASHRAE levels if there is clear and convincing evidence in support of doing so.[3] (42 U.S.C. 6313(a)(6)(A)) Because

[3] Although EPCA does not explicitly define the term ''amended'' in the context of ASHRAE Standard 90.1, DOE provided its interpretation of what would constitute an ''amended standard'' in a final rule published in the *Federal Register* on March 7, 2007. 72 FR 10038. In that rule, DOE stated that the statutory trigger requiring DOE to adopt uniform national standards based on ASHRAE action is for ASHRAE to change a standard for any of the equipment listed in EPCA section 342(a)(6)(A)(i) (42 U.S.C. 6313(a)(6)(A)(i)) by increasing the energy efficiency level for that equipment type. *Id.* at 10042. In other words, if the revised ASHRAE Standard 90.1 leaves the standard level unchanged or lowers the standard, as compared to the level specified by the national standard adopted pursuant to EPCA, DOE does not have the authority to conduct a rulemaking to consider a higher standard for that equipment pursuant to 42 U.S.C. 6313(a)(6)(A). DOE subsequently reiterated this position in a

more than six years had elapsed since DOE issued a final rule with standards for CUACs and CUHPs or CWAFs, DOE initiated the process to review these standards.

Pursuant to EPCA, DOE's energy conservation program for covered equipment consists essentially of four parts: (1) testing; (2) labeling; (3) the establishment of Federal energy conservation standards; and (4) certification and enforcement procedures. 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 covered equipment. (42 U.S.C. 6314) Manufacturers of covered equipment must use the prescribed DOE test procedure as the basis for certifying to DOE that their equipment comply with the applicable energy conservation standards adopted under EPCA and when making representations to the public regarding their energy use or efficiency. (42 U.S.C. 6314(d)) Similarly, DOE must use these test procedures to determine whether a manufacturer's equipment complies with standards adopted pursuant to EPCA. The DOE test procedures for small, large, and very large air-cooled CUACs/CUHPs and CWAFs currently appear at title 10 of the Code of Federal Regulations ("CFR") in sections 431.96 and 431.76, respectively.

When setting standards for the equipment addressed by today's notice, EPCA, as amended by AEMTCA, prescribes specific statutory criteria for DOE to consider. See generally, 42 U.S.C. 6313(a)(6)(A)–(C). As indicated above, any amended standard for

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final rule published in the *Federal Register* on July 22, 2009, 74 FR 36312, 36313, and on May 16, 2012, 77 FR 28928. In DOE's view, AEMTCA did not alter how DOE would be triggered to adopt an amendment to a performance-based standard found in ASHRAE 90.1.

covered equipment more stringent than the level contained in ASHRAE Standard 90.1 must be supported by clear and convincing evidence that the standard would result in significant additional conservation of energy and is technologically feasible and economically justified. (42 U.S.C. 6313(a)(6)(A)(ii)(II)) In deciding whether a proposed standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens. DOE must make this determination after receiving comments on the proposed standard, and by considering, to the maximum extent practicable, the following seven statutory factors:

1. The economic impact of the standard on manufacturers and consumers of 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 which are likely to result from the standard;
3. The total projected amount of energy 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 conservation; and
7. Other factors the Secretary of Energy considers relevant.

(42 U.S.C. 6313(a)(6)(B)(ii))

Further, EPCA generally applies a rebuttable presumption that a standard is economically justified if the Secretary finds that the additional cost to the customer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy (and, as applicable, water) savings during the first year that the consumer will receive as a result of the standard, as calculated under the applicable test procedure. DOE generally considers these criteria as part of its analysis but consistently conducts a more thorough analysis of a given standard's projected impacts that extends beyond this presumption.

EPCA 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. 6313(a)(6)(B)(iii)(I)) 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 of 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. 6313(a)(6)(B)(iii)(II)(aa))

Additionally, EPCA generally specifies criteria to follow when promulgating multiple energy conservation standards for covered products based on different subcategories. In these cases, DOE must specify a different standard level for a type or class of product 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. See 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 customer 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. See 42 U.S.C. 6295(q)(2). With respect to the equipment addressed by this supplemental notice of proposed rulemaking ("SNOPR"), DOE notes that EPCA prescribes limits on the Agency's ability to promulgate a standard if DOE has made a finding that interested persons have established by a preponderance of the evidence that a standard is likely to result in the unavailability of any product type (or class) of performance characteristics that are substantially the same as those generally available in the United States at the time of the finding. See 42 U.S.C. 6313(B)(iii)(II).

With particular regard to this document, the Energy Independence and Security Act of 2007 ("EISA 2007"), Public Law 110-140 (December 19, 2007), amended EPCA, in relevant part, to grant DOE authority to issue a type of final rule (i.e. a "direct final

rule") establishing an energy conservation standard for a product on receipt of a statement submitted jointly by interested persons that are fairly representative of relevant points of view (including representatives of manufacturers of the covered equipment at issue, States, and efficiency advocates), as determined by the Secretary. That statement must contain recommendations with respect to an energy or water conservation standard that are in accordance with the provisions of 42 U.S.C. 6295(o) or 42 U.S.C. 6313(a)(6)(B), as applicable. A notice of proposed rulemaking ("NOPR") that proposes an identical energy efficiency standard must be published simultaneously with the direct final rule and a public comment period of at least 110 days provided. See 42 U.S.C. 6295(p)(4). This provision also applies to equipment at issue addressed by this SNOPR and the accompanying direct final rule published elsewhere in this Federal Register. See 42 U.S.C. 6316(b)(1) Not later than 120 days after the date on which a direct final rule issued under this authority is published in the Federal Register, the Secretary shall withdraw the direct final rule if the Secretary receives 1 or more adverse public comments relating to the direct final rule or any alternative joint recommendation and based on the rulemaking record relating to the direct final rule, the Secretary determines that such adverse public comments or alternative joint recommendation may provide a reasonable basis for withdrawing the direct final rule under subsection 42 U.S.C. 6295(o), 6313(a)(6)(B), or any other applicable law. On withdrawal of a direct final rule, the Secretary shall 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. In this instance, because DOE has already published NOPRs related to the amendment of standards both CUACs/CUHPs and CWAFs, see 79 FR

58948 (September 30, 2014) (CUAC/CUHP proposal) and 80 FR 6182 (February 4, 2015), DOE is publishing an SNOPR consistent with the direct final rule's statutory requirements.

Responding to comments received from interested parties with respect to DOE's proposals, on April 1, 2015, DOE issued a Notice of Intent to Establish the Commercial Package Air Conditioners and Commercial Warm Air Furnaces Working Group to Negotiate Potential Energy Conservation Standards for Commercial Package Air Conditioners and Commercial Warm Air Furnaces. 80 FR 17363. The CUAC/CUHP-CWAF Working Group (in context, "the Working Group") was established under the Appliance Standards and Rulemaking Federal Advisory Committee ("ASRAC") in accordance with the Federal Advisory Committee Act and the Negotiated Rulemaking Act with the purpose of discussing and, if possible, reaching consensus on a set of energy conservation standards to propose or finalize for CUACs, CUHPs and CWAFs. The Working Group was to consist of fairly representative parties having a defined stake in the outcome of the proposed standards, and would consult, as appropriate, with a range of experts on technical issues.

DOE received 17 nominations for membership. Ultimately, the Working Group consisted of 17 members, including one member from ASRAC and one DOE representative.[4] The Working Group met six times (five times in-person and once by

[4] The group members were John Cymbalsky (U.S. Department of Energy), Marshall Hunt (Pacific Gas & Electric Company, San Diego Gas & Electric Company, Southern California Edison, and Southern California Gas Company), Andrew deLaski (Appliance Standards Awareness Project), Louis Starr

teleconference). The meetings were held on April 28, May 11-12, May 20-21, June 1-2, June 9-10, and June 15, 2015. As a result of these efforts, the Working Group successfully reached consensus on energy conservation standards for CUACs, CUHPs, and CWAFs. On June 15, 2015, it submitted a Term Sheet to ASRAC outlining its recommendations, which ASRAC subsequently adopted.[5] See http://www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0007-0093.

DOE has determined that the statement containing recommendations with respect to energy conservation standards for CUACs, CUHPs and CWAFs was submitted jointly by interested persons that are fairly representative of relevant points of view, in accordance with 42 U.S.C. 6295(p)(4)(A) and 6313(a)(6)(B).[6] In reaching this determination, DOE took into consideration the fact that the Working Group, in conjunction with ASRAC members who approved the recommendations, consisted of representatives of manufacturers of covered products, States, and efficiency advocates -- all of which are groups specifically identified by Congress as relevant parties to any

(Northwest Energy Efficiency Alliance), Meg Waltner (Natural Resources Defense Council), Jill Hootman (Ingersoll Rand/Trane), John Hurst (Lennox), Karen Meyers (Rheem Manufacturing Company), Charlie McCrudden (Air Conditioning Contractors of America), Harvey Sachs (American Council for an Energy Efficient Economy), Paul Doppel (Mitsubishi Electric), Robert Whitwell (United Technologies Corporation), Michael Shows (Underwriters Laboratories), Russell Tharp (Goodman Manufacturing), Sami Zendah (Emerson Climate Technologies), Mark Tezigni (Sheet Metal and Air Conditioning Contractors National Association, Inc.), Nick Mislak (Air-Conditioning, Heating, and Refrigeration Institute).

[5] Available at http://www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0007-0093. The following individuals served as members of ASRAC that received and approved the Term Sheet: Co-Chair John Mandyck (Carrier/United Technologies Corporation), Co-Chair Andrew deLaski (Appliance Standards Awareness Project), Ashley Armstrong (U.S. Department of Energy), John Caskey (National Electrical Manufacturers Association), Jennifer Cleary (Association of Home Appliance Manufacturers), Thomas Eckman (Northwest Power and Conservation Council), Charles Hon (True Manufacturing Company), Dr. David Hungerford (California Energy Commission), Dr. Diane Jakobs (Rheem Manufacturing Company), Kelley Kline (General Electric, Appliances), Deborah Miller (National Association of State Energy Officials), and Scott Blake Harris (Harris, Wiltshire & Grannis, LLP).

[6] See 42 U.S.C. 6313(b) (applying 42 U.S.C. 6295(p)(4) to energy conservation standard rulemakings involving a variety of industrial equipment, including CUACs, CUHPs, and CWAFs).

consensus recommendation. (42 U.S.C. 6295(p)(4)(A) As delineated above, the Term Sheet was signed and submitted by a broad cross-section of interests, including the manufacturers of the subject equipment, trade associations representing these manufacturers and installation contractors, environmental and energy-efficiency advocacy organizations, and electric utility companies. The ASRAC Committee approving the Working Group's recommendations included at least two members representing States -- one representing the National Association of State Energy Officials (NASEO) and one representing the State of California.[7] By its plain terms, the statute contemplates that the Secretary will exercise discetion to determine whether a given statement is "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)." In this case, given the broad range of persons participating in the process that led to the submission – in the Working Group and in ASRAC – and given the breadth of perspectives expressed in that process, DOE has determined that the statement it received meets this criterion.

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. In making this determination, DOE has conducted an analysis to evaluate whether the potential energy conservation standards under consideration would meet these requirements. This evaluation is similar to the comprehensive approach that DOE typically conducts

[7] These individuals were Deborah E. Miller (NASEO) and David Hungerford (California Energy Commission).

whenever it considers potential energy conservation standards for a given type of product or equipment. DOE applies the same principles to any consensus recommendations it may receive to satisfy its statutory obligation to ensure that any energy conservation standard that it adopts achieves the maximum improvement in energy efficiency that is technologically feasible and economically justified and will result in the significant conservation of energy. Upon review, the Secretary determined that the Term Sheet submitted in the instant rulemaking comports with the standard-setting criteria set forth under 42 U.S.C. 6313(a)(6)(B). As a result, DOE published a direct final rule establishing energy conservation standards for CUACs/CUHPs and CWAFs elsewhere in today's 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 today's Federal Register. That document includes additional discussion of the EPCA requirements for promulgation of energy conservation standards; the current standards for CUACs/CUHPs and CWAFs; the history of the standards rulemakings establishing such standards; and information on the test procedures used to measure the energy efficiency of CUACs/CUHPs and CWAFs. The document also contains an in-depth discussion of the analyses conducted in support of this rulemaking, the methodologies DOE used in conducting those analyses, and the analytical results.

II. Proposed Standards

When considering more stringent standards for the equipment at issue, DOE must determine, supported by clear and convincing evidence that adopting those standards would result in the significant additional conservation of energy and be technologically feasible and economically justified. See 42 U.S.C. 6313(a)(6)(A)(ii). In determining whether a standard is economically justified, the Secretary must determine whether the benefits of the standard exceed its burdens by, to the greatest extent practicable, considering the seven statutory factors discussed previously. (42 U.S.C. 6313(a)(6)(B)(ii)(I)-(VII))

DOE considered the impacts of amended standards for CUACs/CUHPs and CWAFs at each TSL, beginning with the maximum technologically feasible level, to determine whether that level would be economically justified. Where the max-tech level was not justified, DOE then considered the next most efficient level and undertook the same evaluation until it reached the highest efficiency level that is both technologically feasible and economically justified and saves a significant amount of energy.

To aid the reader as DOE discusses the benefits and/or burdens of each TSL, tables in this section present a summary of the results of DOE's quantitative analysis for each TSL. In addition to the quantitative results presented in the tables, DOE also considers other burdens and benefits that affect economic justification.

A. Benefits and Burdens of TSLs Considered for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment

Table II.1 and Table II.2 summarize the quantitative impacts estimated for each TSL for CUACs and CUHPs. The national impacts are measured over the lifetime of CUACs and CUHPs purchased in the 2018-2048 period. The energy savings, emissions reductions, and value of emissions reductions refer to full-fuel-cycle results. The efficiency levels contained in each TSL are described in section V.A of the direct final rule.

Table II.1. Summary of Analytical Results for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment: National Impacts

Category	TSL 1	TSL 2	TSL 2.5	Recommended TSL*	TSL 3	TSL 3.5	TSL 4	TSL 5
National FFC Energy Savings (quads)								
	5.3	9.8	13.9	14.8	15.9	16.4	19.7	23.4
NPV of Consumer Benefits (2014$ billion)								
3% discount rate	18.0	32.8	47.5	50.0	53.7	55.3	64.1	68.2
7% discount rate	5.4	10.1	15.1	15.2	16.8	17.1	19.2	18.8
Cumulative Emissions Reduction (Total FFC Emissions)								
CO_2 (million metric tons)	314	578	824	873	943	973	1,167	1,383
SO_2 (thousand tons)	164	303	431	454	493	508	610	722
NO_X (thousand tons)	586	1,080	1,538	1,634	1,759	1,815	2,180	2,584
Hg (tons)	0.61	1.12	1.59	1.68	1.82	1.88	2.25	2.66
CH_4 (thousand tons)	1,401	2,582	3,677	3,917	4,208	4,342	5,215	6,185
N_2O (thousand tons)	3.45	6.35	9.05	9.54	10.34	10.67	12.80	15.16
CH_4 (million tons CO_2eq**)	39.2	72.3	103.0	109.7	117.8	121.6	146.0	173.2
N_2O (thousand tons CO_2eq**)	913	1,682	2,397	2,528	2,741	2,828	3,392	4,017
Value of Emissions Reduction (Total FFC Emissions)								
CO_2 (2014$ billion)†	1.845 to 27.53	3.409 to 50.82	4.870 to 72.52	5.046 to 75.94	5.556 to 82.83	5.729 to 85.44	6.860 to 102.4	8.127 to 121.4
NO_X – 3% discount rate (2014$ million)	1,828	3,376	4,820	5,038	5,503	5,677	6,804	8,067
NO_X – 7% discount rate (2014$ million)	606	1,121	1,604	1,614	1,826	1,881	2,245	2,652

* For the Recommended TSL, the NES is forecasted over the lifetime of equipment sold from 2018-2048. For the other TSLs, the NES is forecasted over the lifetime of equipment sold from 2019-2048.
** CO_2eq is the quantity of CO_2 that would have the same global warming potential (GWP).
† Range of the economic value of CO_2 reductions is based on estimates of the global benefit of reduced CO_2 emissions.

Table II.2. Summary of Analytical Results for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment: Manufacturer and Consumer Impacts

Category	TSL 1	TSL 2	TSL 2.5	Recommended TSL	TSL 3	TSL 3.5	TSL 4	TSL 5
Manufacturer Impacts								
Industry NPV (2014$ million) (No-new-standards case INPV = 1,638.2)	1,431.0 to 1,705.5	1,421.9 to 1,758.6	1,300.5 to 1,721.1	1,204.1 to 1,606.1	1,197.4 to 1,697.0	1,138.2 to 1,670.3	1,025.0 to 1,660.9	762.7 to 1,737.6
Industry NPV (% change)	(6.5) to 3.7	(13.5) to 6.9	(20.9) to 4.7	(26.8) to (2.3)	(27.2) to 3.2	(30.8) to 1.6	(37.7) to 1.0	(53.6) to 5.7
Commercial Consumer Average LCC Savings (2014$)								
Small CUACs	(210)	870	3,777	4,233	4,233	3,517	3,035	5,326
Large CUACs	3,997	3,728	7,991	10,135	10,135	12,266	16,803	12,900
Very Large CUACs	1,547	4,777	8,610	8,610	8,881	8,881	18,386	18,338
Average*	1,045	1,971	5,340	6,220	6,238	6,396	8,370	8,697
Commercial Consumer PBP (years)								
Small CUACs	14.9	8.5	4.9	4.9	4.9	2.6	2.5	4.6
Large CUACs	1.3	2.4	2.4	2.6	2.6	2.6	2.5	4.6
Very Large CUACs	5.8	7.0	6.2	6.2	7.2	7.2	5.6	6.3
Average*	10.6	6.7	4.3	4.4	4.5	3.0	2.8	4.8
% of Consumers that Experience Net Cost								
Small CUACs	48%	25%	5%	5%	5%	13%	25%	16%
Large CUACs	0%	10%	5%	2%	2%	1%	1%	11%
Very Large	7%	13%	7%	7%	23%	23%	3%	6%

Category	TSL 1	TSL 2	TSL 2.5	Recommended TSL	TSL 3	TSL 3.5	TSL 4	TSL 5
CUACs								
Average*	32%	20%	5%	4%	6%	11%	16%	14%

Parentheses indicate negative (-) values.
* Weighted by shares of each equipment class in total projected shipments in the year of compliance.

DOE first considered TSL 5, which represents the max-tech efficiency levels. TSL 5 would save 23.4 quads of energy, an amount DOE considers significant. Under TSL 5, the NPV of consumer benefit would be $18.8 billion using a discount rate of 7-percent, and $68.2 billion using a discount rate of 3-percent.

The cumulative emissions reductions at TSL 5 are 1,383 million Mt of CO_2, 722 thousand tons of SO_2, 2,584 thousand tons of NO_X, 2.66 tons of Hg, 6,185 thousand tons of CH_4, and 15.16 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 5 ranges from $8.127 billion to $121.4 billion.

At TSL 5, the average LCC impact is a savings of $5,326 for small CUACs, $12,900 for large CUACs, and $18,338 for very large CUACs. The simple payback period is 4.6 years for small CUACs, 4.6 years for large CUACs, and 6.3 years for very large CUACs. The fraction of consumers experiencing a net LCC cost is 16 percent for small CUACs, 11 percent for large CUACs, and 6 percent for very large CUACs. Although DOE did not estimate consumer impacts for CUHPs, the results would be very similar to those for CUACs for the reasons stated in section V.B.1 of the direct final rule.

At TSL 5, the projected change in INPV ranges from a decrease of $881.9 million to an increase of $93.1 million, which corresponds to a change of -53.7 percent and 5.7 percent, respectively. The industry is expected to incur $591.0 million in total conversion costs at this level. DOE projects that 98.7 percent of current equipment listings would require redesign at this level to meet this standard level today. At this level, DOE recognizes that manufacturers could face technical resource constraints. Manufacturers stated they would require additional engineering expertise and additional test laboratory capacity. It is unclear whether manufacturers could complete the hiring of the necessary technical expertise and construction of the necessary test facilities in time to allow for the redesign of all equipment to meet max-tech by 2019. Furthermore, DOE recognizes that a standard set at max-tech could greatly limit equipment differentiation in the CUAC/CUHP market. By commoditizing a key differentiating feature, a standard set at max-tech would likely accelerate consolidaton in the industry.

The Secretary tentatively concludes that at TSL 5 for CUACs and CUHPs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on some consumers, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a large reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 5 is not economically justified.

DOE then considered TSL 4. TSL 4 would save 19.7 quads of energy, an amount DOE considers significant. Under TSL 4, the NPV of consumer benefit would be $19.2 billion using a discount rate of 7-percent, and $64.1 billion using a discount rate of 3-percent.

The cumulative emissions reductions at TSL 4 are 1,167 million Mt of CO_2, 610 thousand tons of SO_2, 2,180 thousand tons of NO_X, 2.25 tons of Hg, 5,215 thousand tons of CH_4, and 12.80 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 4 ranges from $6.860 billion to $102.4 billion.

At TSL 4, the average LCC impact is a savings of $3,035 for small CUACs, $16,803 for large CUACs, and $18,386 for very large CUACs. The simple payback period is 2.5 years for small CUACs, 2.5 years for large CUACs, and 5.6 years for very large CUACs. The fraction of consumers experiencing a net LCC cost is 25 percent for small CUACs, 1 percent for large CUACs, and 3 percent for very large CUACs. Although DOE did not estimate consumer impacts for CUHPs, the results would be very similar to those for CUACs for the reasons stated in section V.B.1 of the direct final rule.

At TSL 4, the projected change in INPV ranges from a decrease of $619.6 million to an increase of $16.3 million, which corresponds to a change of -37.7 percent and 1.0 percent, respectively. The industry is expected to incur $538.8 million in total conversion costs at this level. DOE projects that 96.0 percent of current equipment listings would require redesign at this level to meet this standard level today.

The Secretary tentatively concludes that at TSL 4 for CUACs and CUHPs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on some consumers, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 4 is not economically justified.

DOE then considered TSL 3.5. TSL 3.5 would save 16.4 quads of energy, an amount DOE considers significant. Under TSL 3.5, the NPV of consumer benefit would be $17.1 billion using a discount rate of 7-percent, and $55.3 billion using a discount rate of 3-percent.

The cumulative emissions reductions at TSL 3.5 are 973 million Mt of CO_2, 508 thousand tons of SO_2, 1,815 thousand tons of NO_X, 1.88 tons of Hg, 4,342 thousand tons of CH_4, and 10.67 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 3.5 ranges from $5.729 billion to $85.44 billion.

At TSL 3.5, the average LCC impact is a savings of $3,517 for small CUACs, $12,266 for large CUACs, and $8,881 for very large CUACs. The simple payback period is 2.6 years for small CUACs, 2.6 years for large CUACs, and 7.2 years for very large CUACs. The fraction of consumers experiencing a net LCC cost is 13 percent for small

CUACs, 1 percent for large CUAC, and 23 percent for very large CUACs. Although DOE did not estimate consumer impacts for CUHPs, the results would be very similar to those for CUACs for the reasons stated in section V.B.1 of the direct final rule.

At TSL 3.5, the projected change in INPV ranges from a decrease of $506.4 million to an increase of $25.7 million, which corresponds to a change of -30.8 percent and 1.6 percent, respectively. The industry is expected to incur $489.2 million in total conversion costs at this level. DOE projects that 93.5 percent of current equipment listings would require redesign at this level to meet this standard level today.

The Secretary tentatively concludes that at TSL 3.5 for CUACs and CUHPs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on some consumers, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 3.5 is not economically justified.

DOE then considered TSL 3. TSL 3 would save 15.9 quads of energy, an amount DOE considers significant. Under TSL 3, the NPV of consumer benefit would be $16.8 billion using a discount rate of 7-percent, and $53.7 billion using a discount rate of 3-percent.

The cumulative emissions reductions at TSL 3 are 943 million Mt of CO_2, 493 thousand tons of SO_2, 1,759 thousand tons of NO_X, 1.82 tons of Hg, 4,208 thousand tons of CH_4, and 10.34 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 3 ranges from $5.556 billion to $82.83 billion.

At TSL 3, the average LCC impact is a savings of $4,233 for small CUACs, $10,135 for large CUACs, and $8,881 for very large CUACs. The simple payback period is 4.9 years for small CUACs, 2.6 years for large CUACs, and 7.2 years for very large CUACs. The fraction of consumers experiencing a net LCC cost is 5 percent for small CUACs, 2 percent for large CUAC, and 23 percent for very large CUACs. Although DOE did not estimate consumer impacts for CUHPs, the results would be very similar to those for CUACs for the reasons stated in section V.B.1 of the direct final rule.

At TSL 3, the projected change in INPV ranges from a decrease of $447.2 million to an increase of $52.4 million, which corresponds to a change of -27.2 percent and 3.2 percent, respectively. DOE projects that 81.6 percent of current equipment listings would require redesign at this level to meet this standard level today.

The Secretary tentatively concludes that at TSL 3 for CUACs and CUHPs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on some consumers, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a large reduction in INPV.

Consequently, the Secretary has tentatively concluded that TSL 3 is not economically justified.

DOE then considered the Recommended TSL, which reflects the standard levels recommended by the Working Group. The Recommended TSL would save 14.8 quads of energy, an amount DOE considers significant. Under the Recommended TSL, the NPV of consumer benefit would be $15.2 billion using a discount rate of 7-percent, and $50.0 billion using a discount rate of 3-percent.

The cumulative emissions reductions at the Recommended TSL are 873 million Mt of CO_2, 454 thousand tons of SO_2, 1,634 thousand tons of NO_X, 1.68 tons of Hg, 3,917 thousand tons of CH_4, and 9.54 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at the Recommended TSL ranges from $5.046 billion to $75.94 billion.

At the Recommended TSL, the average LCC impact is a savings of $4,233 for small CUACs, $10,135 for large CUACs, and $8,610 for very large CUACs. The simple payback period is 4.9 years for small CUACs, 2.6 years for large CUACs, and 6.2 years for very large CUACs. The fraction of consumers experiencing a net LCC cost is 5 percent for small CUACs, 2 percent for large CUACs, and 7 percent for very large CUACs. Although DOE did not estimate consumer impacts for CUHPs, the results would be very similar to those for CUACs for the reasons stated in section V.B.1 of the direct final rule.

The Recommended TSL, as presented by the Working Group and approved by ASRAC, aligns the effective dates of the CUAC/CUHP and CWAF rulemakings. That approach adopts the ASHRAE 90.1-2013 efficiency levels in 2018 and a higher level in in 2023 as recommended by the Working Group. DOE anticipates that aligning the effective dates will reduce total conversion costs and cumulative regulatory burden, while also allowing industry to gain clarity on potential regulations that could affect refrigerant availability before the higher appliance standard takes effect in 2023. DOE projects that 31.5 percent of current equipment listings would require redesign at this level to meet the 2018 standard level, while 79.6 percent of current equipment listings would require redesign at this level to meet the 2023 standard level.

At the Recommended TSL, the projected change in INPV ranges from a decrease of $440.4 million to a decrease of $38.5 million, which corresponds to a change of -26.8 percent and -2.3 percent, respectively. The industry is expected to incur $520.8 million in total conversion costs at this level. However, the industry members of the Working Group noted that aligning the compliance dates for the CUAC/CUHP and CWAF standards in the manner recommended would allow manufacturers to coordinate their redesign and testing expenses for these equipment. (CUAC: AHRI and ACEEE, No. 80 at p. 1). With this coordination, manufacturers explained that there would be a reduction in the total conversion costs associated with today's direct final rule. The resulting synergies from aligning the CUAC/CUHP and CWAF compliance dates would produce

INPV impacts that are less severe than the forecasted INPV range of -26.8 percent to -2.3 percent.

After considering the analysis and weighing the benefits and burdens, DOE has tentatively determined that the recommended standards are in accordance with 42 U.S.C. 6313(a)(6)(B), which contains provisions for adopting a uniform national standard more stringent than the amended ASHRAE Standard 90.1 for the equipment considered in this document. Specifically, the Secretary has tentatively determined, supported by clear and convincing evidence that such adoption would result in the significant additional conservation of energy and is technologically feasible and economically justified. In determining whether the recommended standards are economically justified, the Secretary has tentatively determined that the benefits of the recommended standards exceed the burdens. Namely, the Secretary has tentatively concluded that under the recommended standards for CUACs and CUHPs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, the estimated monetary value of the emissions reductions, and positive average LCC savings would outweigh the negative impacts on some consumers and on manufacturers, including the conversion costs that could result in a reduction in INPV for manufacturers.

The proposed amended energy conservation standards for CUACs and CUHPs, which prescribe the minimum allowable IEER and, for commercial unitary heat pumps, COP, are shown in Table II.3.

Table II.3. Proposed Energy Conservation Standards for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment

Equipment Type		Heating Type	Proposed Energy Conservation Standard	Compliance Date
Small Commercial Packaged AC and HP (Air-Cooled) – ≥65,000 Btu/h and <135,000 Btu/h Cooling Capacity	AC	Electric Resistance Heating or No Heating	12.9 IEER 14.8 IEER	January 1, 2018 January 1, 2023
		All Other Types of Heating	12.7 IEER 14.6 IEER	January 1, 2018 January 1, 2023
	HP	Electric Resistance Heating or No Heating	12.2 IEER 3.3 COP 14.1 IEER 3.4 COP	January 1, 2018 January 1, 2023
		All Other Types of Heating	12.0 IEER 3.3 COP 13.9 IEER 3.4 COP	January 1, 2018 January 1, 2023
Large Commercial Packaged AC and HP (Air-Cooled) – ≥135,000 Btu/h and <240,000 Btu/h Cooling Capacity	AC	Electric Resistance Heating or No Heating	12.4 IEER 14.2 IEER	January 1, 2018 January 1, 2023
		All Other Types of Heating	12.2 IEER 14.0 IEER	January 1, 2018 January 1, 2023
	HP	Electric Resistance Heating or No Heating	11.6 IEER 3.2 COP 13.5 IEER 3.3 COP	January 1, 2018 January 1, 2023
		All Other Types of Heating	11.4 IEER 3.2 COP 13.3 IEER 3.3 COP	January 1, 2018 January 1, 2023
Very Large Commercial Packaged AC and HP (Air-Cooled) – ≥240,000 Btu/h and <760,000 Btu/h Cooling Capacity	AC	Electric Resistance Heating or No Heating	11.6 IEER 13.2 IEER	January 1, 2018 January 1, 2023
		All Other Types of Heating	11.4 IEER 13.0 IEER	January 1, 2018 January 1, 2023
	HP	Electric Resistance	10.6 IEER	January 1, 2018

Equipment Type		Heating Type	Proposed Energy Conservation Standard	Compliance Date
		Heating or No Heating	3.2 COP 12.5 IEER 3.2 COP	January 1, 2023
		All Other Types of Heating	10.4 IEER 3.2 COP 12.3 IEER 3.2 COP	January 1, 2018 January 1, 2023

The benefits and costs of the proposed standards -- which mimic those found in the direct final rule -- can also be expressed in terms of annualized values. The annualized net benefit is the sum of: (1) the annualized national economic value (expressed in 2014$) of the benefits from operating equipment that meet the adopted 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 benefits of CO_2 and NO_X emission reductions.[8]

Table II.4 shows the annualized values for CUACs and CUHPs under the Recommended TSL, expressed in 2014$. The results under the primary estimate are as

[8] To convert the time-series of costs and benefits into annualized values, DOE calculated a present value in 2014, the year used for discounting the NPV of total consumer costs and savings. For the benefits, DOE calculated a present value associated with each year's shipments in the year in which the shipments occur (2020, 2030, etc.), and then discounted the present value from each year to 2015. The calculation uses discount rates of 3- and 7-percent for all costs and benefits except for the value of CO_2 reductions, for which DOE used case-specific discount rates. Using the present value, DOE then calculated the fixed annual payment over a 30-year period, starting in the compliance year that yields the same present value.

follows. Using a 7-percent discount rate for benefits and costs other than CO_2 reduction, (for which DOE used a 3-percent discount rate along with the SCC series that has a value of $40.0/t in 2015),[9] the estimated cost of the standards in this rule is $708 million per year in increased equipment costs, while the estimated annual benefits are $2,099 million in reduced equipment operating costs, $1,320 million in CO_2 reductions, and $147.5 million in reduced NO_X emissions. In this case, the net benefit amounts to $2,859 million per year. Using a 3-percent discount rate for all benefits and costs and the SCC series has a value of $40.0/t in 2015, the estimated cost of the standards is $792 million per year in increased equipment costs, while the estimated annual benefits are $3,441 million in reduced operating costs, $1,320 million in CO_2 reductions, and $267.3 million in reduced NO_X emissions. In this case, the net benefit amounts to $4,237 million per year.

[9] DOE used a 3-percent discount rate because the SCC values for the series used in the calculation were derived using a 3-percent discount rate.

Table II.4 Annualized Benefits and Costs of Proposed Standards for Small, Large, and Very Large Air-Cooled Commercial Package Air Conditioning and Heating Equipment

	Discount Rate	Primary Estimate*	Low Net Benefits Estimate	High Net Benefits Estimate
		Million 2014$/year		
Benefits				
Consumer Operating Cost Savings	7%	2,099	2,021	2,309
	3%	3,441	3,287	3,830
CO_2 Reduction Value ($12.2/t case)**	5%	357	355	361
CO_2 Reduction Value ($40.0/t case)**	3%	1,320	1,313	1,337
CO_2 Reduction Value ($62.3/t case)**	2.5%	1,973	1,964	1,999
CO_2 Reduction Value ($117/t case)**	3%	4,028	4,009	4,080
NO_X Reduction Value†	7%	147.5	146.7	149.5
	3%	267.3	265.9	270.7
Total Benefits††	7% plus CO_2 range	2,603 to 6,275	2,522 to 6,176	2,820 to 6,539
	7%	3,566	3,481	3,796
	3% plus CO_2 range	4,065 to 7,737	3,908 to 7,561	4,462 to 8,181
	3%	5,028	4,866	5,438
Costs				
Consumer Incremental Product Costs	7%	708	888	275
	3%	792	1028	231
Net Benefits				
Total††	7% plus CO_2 range	1,895 to 5,567	1,635 to 5,288	2,546 to 6,265
	7%	2,859	2,593	3,521
	3% plus CO_2 range	3,274 to 6,945	2,879 to 6,533	4,232 to 7,951
	3%	4,237	3,838	5,207

* This table presents the annualized costs and benefits associated with CUACs and CUHPs shipped in 2018-2048. These results include benefits to consumers which accrue after 2048 from the CUACs and CUHPs purchased in 2018-2048. The results account for the incremental variable and fixed costs incurred by manufacturers due to the standard, some of which may be incurred in preparation for the rule. The Primary, Low Benefits, and High Benefits estimates utilize projections of energy prices from the AEO 2015 Reference case, Low Economic Growth case, and High Economic Growth case, respectively. In addition, incremental product costs reflect a constant price trend in the Primary estimate, a slightly increasing price trend in the Low Benefits estimate, and a slightly decreasing price trend in the Low Benefits estimate. The methods used to project price trends are explained in section IV.D.1.

** The CO_2 values represent global monetized values of the SCC, in 2014$, in 2015 under several scenarios of the updated SCC values. The first three cases use the averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth case represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The SCC time series incorporate an escalation factor.
† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to the average SCC with 3-percent discount rate ($40.0/t) case. In the rows labeled "7% plus CO_2 range" and "3% plus CO_2 range," the operating cost and NO_X benefits are calculated using the labeled discount rate, and those values are added to the full range of CO_2 values.

† The $/ton values used for NO_X are described in section IV.L.2 of the direct final rule. DOE estimated the monetized value of NOx emissions reductions using benefit per ton estimates from the Regulatory Impact Analysis titled, "Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants," published in June 2014 by EPA's Office of Air Quality Planning and Standards. (Available at: http://www3.epa.gov/ttnecas1/regdata/RIAs/111dproposalRIAfinal0602.pdf.) For DOE's Primary Estimate and Low Net Benefits Estimate, the agency is presenting a national benefit-per-ton estimate for particulate matter emitted from the Electric Generating Unit sector based on an estimate of premature mortality derived from the ACS study (Krewski et al., 2009). For DOE's High Net Benefits Estimate, the benefit-per-ton estimates were based on the Six Cities study (Lepuele et al., 2011), which are nearly two-and-a-half times larger than those from the ACS study. Because of the sensitivity of the benefit-per-ton estimate to the geographical considerations of sources and receptors of emission, DOE intends to investigate refinements to the agency's current approach of one national estimate by assessing the regional approach taken by EPA's Regulatory Impact Analysis for the Clean Power Plan Final Rule.

†† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to the average SCC with 3-percent discount rate ($40.0/t) case. In the rows labeled "7% plus CO_2 range" and "3% plus CO_2 range," the operating cost and NO_X benefits are calculated using the labeled discount rate, and those values are added to the full range of CO_2 values.

B. Benefits and Burdens of TSLs Considered for Commercial Warm Air Furnaces

Table II.5 and Table II.6 summarize the quantitative impacts estimated for each TSL for CWAFs. For TSL 2, the national impacts are projected over the lifetime of equipment sold in 2023-2048. For the other TSLs, the impacts are projected over the lifetime of equipment sold in 2019-2048. The energy savings, emissions reductions, and value of emissions reductions refer to full-fuel-cycle results. The efficiency levels contained in each TSL are described in section V.A of the direct final rule.

Table II.5. Summary of Analytical Results for Commercial Warm Air Furnaces: National Impacts

	Trial Standard Level				
	1	2	3	4	5
Cumulative FFC Energy Savings quads	0.25	0.23	0.41	0.41	2.4
NPV of Consumer Costs and Benefits 2014$ billion					
3% discount rate	1.1	1.0	-0.1	-0.1	2.6
7% discount rate	0.4	0.3	-0.4	-0.4	-0.4
Cumulative FFC Emissions Reduction					
CO_2 million metric tons	13.4	12.4	22.0	22.0	126
SO_2 thousand tons	0.40	0.40	0.63	0.67	-10.2
NO_X thousand tons	43.0	41.2	70.5	72.2	473
Hg tons	0.001	0.001	0.002	0.002	-0.04
CH_4 thousand tons	159	146	260	260	1,673
CH_4 thousand tons CO_2eq*	4,440	4,096	7,289	7,292	46,831
N_2O thousand tons	0.03	0.03	0.05	0.06	0.08
N_2O thousand tons CO_2eq*	8.8	8.4	14.3	14.6	21.2
Value of Emissions Reduction					
CO_2 2014$ million**	79.8 to 1,185	71.4 to 1,078	126 to 1,891	126 to 1,897	713 to 10,809
NO_X – 3% discount rate 2014$ million	120 to 264	110 to 243	188 to 414	192 to 424	1258 to 2772
NO_X – 7% discount rate 2014$ million	42.3 to 94.4	36.1 to 80.9	64.2 to 144	65.9 to 147	423 to 945

For TSL 2, the impacts are projected over the lifetime of equipment sold in 2023-2048. For the other TSLs, the impacts are projected over the lifetime of equipment sold in 2019-2048.

* CO_2eq is the quantity of CO_2 that would have the same global warming potential (GWP).

** Range of the economic value of CO_2 reductions is based on estimates of the global benefit of reduced CO_2 emissions.

Table II.6. Summary of Analytical Results for Commercial Warm Air Furnaces: Manufacturer and Consumer Impacts*

Category	Trial Standard Level				
	1	2	3	4	5
Manufacturer Impacts					
Industry NPV (2014$ million) (No-New-Standards Case INPV = 96.3)	85.8 to 92.6	83.0 to 90.5	65.5 to 125.2	60.4 to 124.8	(19.3) to 143.5
Industry NPV (% change)	(11.0) to (3.9)	(13.9) to (6.1)	(32.0) to 29.9	(37.3) to 29.5	(120.1) to 49.0
Consumer Average LCC Savings (2014$)					
Gas-Fired Commercial Warm Air Furnaces	$284	$284	$75	$75	$766
Oil-Fired Commercial Warm Air Furnaces	NA	$400	NA	$400	$1,817
Average*	$284	$285	$75	$79	$781
Consumer Simple PBP (years)					
Gas-Fired Commercial Warm Air Furnaces	1.4	1.4	12.3	12.3	11.3
Oil-Fired Commercial Warm Air Furnaces	NA	1.9	NA	1.9	7.5
Average*	1.4	1.4	12.3	12.1	11.3
% of Consumers that Experience Net Cost					
Gas-Fired Commercial Warm Air Furnaces	6%	6%	58%	58%	58%
Oil-Fired Commercial Warm Air Furnaces	0%	11%	0%	11%	54%

* Weighted by shares of each equipment class in total projected shipments in 2019.

† At max tech, the standard will likely require CWAF manufacturers to make design changes to the cooling components of commercial HVAC products and to the chassis that houses the heating and cooling components. Because these cooling system changes are triggered by the CWAF standard, they are taken into account in the MIA's estimate of conversion costs. The additional expense of updating the commercial cooling product contributes to an INPV loss that is greater than 100%.

DOE first considered TSL 5, which represents the max-tech efficiency levels. TSL 5 would save 2.4 quads of energy, an amount DOE considers significant. Under TSL 5, the NPV of consumer cost would be $0.4 billion using a 7-percent discount rate, and the NPV of consumer benefit would be $2.6 billion using a 3-percent discount rate.

The cumulative emissions reductions at TSL 5 are 126 Mt of CO_2, 473 thousand tons of NO_X, 1,673 thousand tons of CH_4, and 0.08 thousand tons of N_2O. Projected

emissions show an increase of 10.2 thousand tons of SO_2 and 0.04 ton of Hg, The estimated monetary value of the CO_2 emissions reduction at TSL 5 ranges from $713 million to $10,809 million.

At TSL 5, the average LCC impact is a savings of $766 for gas-fired CWAFs and $1,817 for oil-fired CWAFs. The simple payback period is 11.3 years for gas-fired CWAFs and 7.5 years for oil-fired CWAFs. The fraction of consumers experiencing a net LCC cost is 58 percent for gas-fired CWAF and 54 percent for oil-fired CWAFs.

At TSL 5, the projected change in INPV ranges from a decrease of $115.7 million to an increase of $47.2 million, which corresponds to a change of -120.1 percent and 49.0 percent, respectively. The industry is expected to incur $157.5 million in total conversion costs at this level. DOE projects that 99 percent of current equipment listings would require redesign at this level.

The Secretary tentatively concludes that at TSL 5 for CWAFs, the benefits of energy savings, positive NPV of consumer benefits using a discount rate of 3 percent, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on most consumers, the negative NPV of consumer benefits using a 7-percent discount rate, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a large reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 5 is not economically justified.

DOE then considered TSL 4. TSL 4 would save 0.41 quads of energy, an amount DOE considers significant. Under TSL 4, the NPV of consumer cost would be $0.4 billion using a 7-percent discount rate, and $0.1 billion using a 3-percent discount rate.

The cumulative emissions reductions at TSL 4 are 22 Mt of CO_2, 0.67 thousand tons of SO_2, 72.2 thousand tons of NO_X, 0.002 ton of Hg, 260 thousand tons of CH_4, and 0.06 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 4 ranges from $126 million to $1,897 million.

At TSL 4, the average LCC impact is a savings of $75 for gas-fired CWAFs and $400 for oil-fired CWAFs. The simple payback period is 12.3 years for gas-fired CWAFs and 1.9 years for oil-fired CWAFs. The fraction of consumers experiencing a net LCC cost is 58 percent for gas-fired CWAFs, and 11 percent for oil-fired CWAFs.

At TSL 4, the projected change in INPV ranges from a decrease of $35.9 million to an increase of $28.4 million, which corresponds to a change of -37.3 percent and 29.5 percent, respectively. The industry is expected to incur $47.6 million in total conversion costs at this level. DOE projects that 94 percent of current product listings would require redesign at this level.

The Secretary tentatively concludes that at TSL 4 for CWAFs, the benefits of energy savings, emission reductions, and the estimated monetary value of the emissions

reductions would be outweighed by the economic burden on many consumers, negative NPV of consumer benefits, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a large reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 4 is not economically justified.

DOE then considered TSL 3. TSL 3 would save 0.41 quads of energy, an amount DOE considers significant. Under TSL 3, the NPV of consumer cost would be $0.4 billion using a 7-percent discount rate, and $0.1 billion using a 3-percent discount rate.

The cumulative emissions reductions at TSL 3 are 22 Mt of CO_2, 0.63 thousand tons of SO_2, 70.5 thousand tons of NO_X, 0.002 ton of Hg, 260 thousand tons of CH_4, and 0.05 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 3 ranges from $126 million to $1,891 million.

At TSL 3, the average LCC impact is a savings of $75 for gas-fired CWAFs. The simple payback period is 12.3 years for gas-fired CWAFs. The fraction of consumers experiencing a net LCC cost is 58 percent for gas-fired CWAFs. The EL at TSL 3 for oil-fired CWAFs is the baseline, so there are no LCC impacts for oil-fired CWAFs at TSL 3.

At TSL 3, the projected change in INPV ranges from a decrease of $30.9 million to an increase of $28.8 million, which corresponds to a change of -32.0 percent and 29.9

percent, respectively. The industry is expected to incur $41.0 million in total conversion costs at this level. DOE projects that 91 percent of current equipment listings would require redesign at this level.

The Secretary tentatively concludes that at TSL 3 for CWAFs, the benefits of energy savings, emission reductions, and the estimated monetary value of the emissions reductions would be outweighed by the economic burden on many consumers, negative NPV of consumer benefits, and the impacts on manufacturers, including the conversion costs and profit margin impacts that could result in a large reduction in INPV. Consequently, the Secretary has tentatively concluded that TSL 3 is not economically justified.

DOE then considered TSL 2, which corresponds to the recommendations by the Working Group. TSL 2 would save 0.23 quads of energy, an amount DOE considers significant. Under TSL 2, the NPV of consumer benefit would be $0.3 billion using a 7-percent discount rate, and $1.0 billion using a 3-percent discount rate.

The cumulative emissions reductions at TSL 2 are 12.4 Mt of CO_2, 0.40 thousand tons of SO_2, 41.2 thousand tons of NO_X, 0.001 ton of Hg, 146 thousand tons of CH_4, and 0.03 thousand tons of N_2O. The estimated monetary value of the CO_2 emissions reduction at TSL 2 ranges from $71.4 million to $1,078 million.

At TSL 2, the average LCC impact is a savings of $284 for gas-fired CWAFs and $400 for oil-fired CWAFs. The simple payback period is 1.4 years for gas-fired CWAF

and 1.9 years for oil-fired CWAFs. The fraction of consumers experiencing a net LCC cost is 6 percent for gas-fired CWAFs and 11 percent for oil-fired CWAFs.

At TSL 2, 57 percent of current equipment listings would require redesign at this level. The projected change in INPV ranges from a decrease of $13.4 million to a decrease of $5.9 million, which corresponds to a decrease of 13.9 percent and 6.1 percent, respectively. The CWAF industry is expected to incur $22.2 million in total conversion costs. However, the industry noted that aligning the compliance dates for the CUAC/CUHP and CWAF standards, as recommended by the Working Group, would allow manufacturers to coordinate their redesign and testing expenses for this equipment. If this occurs, there could be a reduction in the total conversion costs associated with today's DFR. The resulting synergies from aligning the compliance dates of the CUAC/CUHP and CWAF standards would produce INPV impacts that are less severe than the forecasted INPV range of -13.9 percent to -6.1 percent.

After considering the analysis and weighing the benefits and burdens, DOE has tentatively determined that the recommended standards are in accordance with 42 U.S.C. 6313(a)(6)(B), which contains provisions for adopting a uniform national standard more stringent than the amended ASHRAE/IES Standard 90.1 for the equipment considered in this document. Specifically, the Secretary has tentatively determined, supported by clear and convincing evidence, that such adoption would result in significant additional conservation of energy and is technologically feasible and economically justified. In determining whether the recommended standards are economically justified, the

Secretary has tentatively determined that the benefits of the recommended standards exceed the burdens. Namely, the Secretary has tentatively concluded that under the recommended standards for CWAFs, the benefits of energy savings, positive NPV of consumer benefits, emission reductions, the estimated monetary value of the emissions reductions, and positive average LCC savings would outweigh the negative impacts on some consumers and on manufacturers, including the conversion costs that could result in a reduction in INPV for manufacturers.

Based on the above analyses, DOE is proposing to amend the energy conservation standards for CWAFs -- as expressed in terms of thermal efficiency -- in the manner shown in Table II.7.

Table II.7. Proposed Energy Conservation Standards for Commercial Warm Air Furnaces

Equipment Type	Input Capacity (Btu/h)	Thermal Efficiency
Gas-fired CWAFs	≥ 225,000 Btu/h	81%
Oil-fired CWAFs	≥ 225,000 Btu/h	82%

The benefits and costs of the proposed standards can also be expressed in terms of annualized values. The annualized net benefit is the sum of: (1) the annualized national economic value (expressed in 2014$) of the benefits from operating equipment that meet the adopted standards (consisting primarily of operating cost savings from using less energy, minus increases in equipment purchase costs), and (2) the annualized monetary value of the benefits of CO_2 and NO_X emission reductions.

Table II.8 shows the annualized values for CWAFs under TSL 2, expressed in 2014$. The results under the primary estimate are as follows. Using a 7-percent discount rate for benefits and costs other than CO_2 reductions, (for which DOE used a 3-percent discount rate along with the average SCC series corresponding to a value of $40.0/ton in 2015 (2014$)), the estimated cost of the adopted standards for CWAFs is $4.31 million per year in increased equipment costs, while the estimated benefits are $49.0 million per year in reduced equipment operating costs, $24 million per year in CO_2 reductions, and $5.49 million per year in reduced NO_X emissions. In this case, the net benefit amounts to $75 million per year.

Using a 3-percent discount rate for all benefits and costs and the average SCC series corresponding to a value of $40.0/ton in 2015 (in 2014$), the estimated cost of the adopted standards for CWAFs is $4.38 million per year in increased equipment costs, while the estimated benefits are $71 million per year in reduced operating costs, $24.3 million per year in CO_2 reductions, and $8.76 million per year in reduced NO_X emissions. In this case, the net benefit amounts to $100 million per year.

Table II.8. Annualized Benefits and Costs of Proposed Standards (TSL 2) for Commercial Warm Air Furnaces

	Discount Rate %	Primary Estimate*	Low Net Benefits Estimate*	High Net Benefits Estimate*
		Million 2014$/year		
Benefits				
Consumer Operating Cost Savings	7	49	48	54
	3	71	70	81
CO_2 Reduction Value ($12.2/t case)**	5	6.99	7.08	7.37
CO_2 Reduction Value ($40.0/t case)**	3	24	25	26
CO_2 Reduction Value ($62.3/t case)**	2.5	36	36	38
CO_2 Reduction Value ($117/t case)**	3	74	75	79
NO_x Reduction Value†	7	5 to 11	5 to 11	5 to 11
	3	8 to 17	8 to 17	8 to 18
Total Benefits††	7 plus CO2 range	61 to 134	60 to 134	67 to 144
	7	78	78	85
	3 plus CO2 range	86 to 162	84 to 162	96 to 177
	3	103	102	114
Costs				
Consumer Incremental Installed Costs	7	4.31	5.04	3.92
	3	4.38	5.22	3.94
Net Benefits				
Total††	7 plus CO2 range	57 to 130	55 to 129	63 to 140
	7	74	72	81
	3 plus CO2 range	82 to 158	79 to 157	92 to 173
	3	99	97	110

* This table presents the annualized costs and benefits associated with CWAFs shipped in 2023−2048. These results include benefits to consumers which accrue after 2048 from the CWAFs purchased from 2023−2048. The results account for the incremental variable and fixed costs incurred by manufacturers due to the standard, some of which may be incurred in preparation for the rule. The Primary, Low Benefits, and High Benefits Estimates utilize projections of energy prices from the AEO 2015 Reference case, Low Economic Growth case, and High Economic Growth case, respectively. In addition, incremental equipment costs reflect a medium decline rate in the Primary Estimate, a low decline rate in the Low Benefits Estimate, and a high decline rate in the High Benefits Estimate.

** The CO_2 values represent global monetized values of the SCC, in 2014$, in 2015 under several scenarios of the updated SCC values. The first three cases use the averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth case represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The SCC time series incorporate an escalation factor.
† The $/ton values used for NO_X are described in the Direct Final Rule, section. DOE estimated the monetized value of NOx emissions reductions using benefit per ton estimates from the Regulatory Impact Analysis titled, "Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants," published in June 2014 by EPA's Office of Air Quality Planning and Standards. (Available at: http://www3.epa.gov/ttnecas1/regdata/RIAs/111dproposalRIAfinal0602.pdf.) For DOE's Primary Estimate and Low Net Benefits Estimate, the agency is presenting a national benefit-per-ton estimate for particulate matter emitted from the Electric Generating Unit sector based on an estimate of premature mortality derived from the ACS study (Krewski et al., 2009). For DOE's High Net Benefits Estimate, the benefit-per-ton estimates were based on the Six Cities study (Lepuele et al., 2011), which are nearly two-and-a-half times larger than those from the ACS study. Because of the sensitivity of the benefit-per-ton estimate to the geographical considerations of sources and receptors of emission, DOE intends to investigate refinements to the agency's current approach of one national estimate by assessing the regional approach taken by EPA's Regulatory Impact Analysis for the Clean Power Plan Final Rule.
†† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to the average SCC with 3-percent discount rate ($40.0/t case. In the rows labeled "7% plus CO_2 range" and "3% plus CO_2 range," the operating cost and NO_X benefits are calculated using the labeled discount rate, and those values are added to the full range of CO_2 values.

III. Public Participation

Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than 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 notice.

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 below.

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 mail. Comments and documents submitted via email, hand delivery/courier, or 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 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, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person that would result from public disclosure; (6) when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

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).

IV. Procedural Issues and Regulatory Review

The regulatory reviews conducted for this proposed rule are identical to those conducted for the direct final rule published elsewhere in today's Federal Register. Please see the direct final rule for further details.

V. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this proposed rule.

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Intergovernmental relations, Reporting and recordkeeping requirements, Small businesses.

Issued in Washington, DC, on 12/17/15

David T. Danielson
Assistant Secretary
Energy Efficiency and Renewable Energy

For the reasons set forth in the preamble, DOE proposes to amend part 431 of chapter II, subchapter D, of title 10 of the Code of Federal Regulations, to read 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.

2. Section 431.77 is revised to read as follows:

§ 431.77 Energy conservation standards and their effective dates.

(a) *Gas-fired Commercial Warm Air Furnaces*. Each gas-fired commercial warm air furnace must meet the following energy efficiency standard levels:

(1) For gas-fired commercial warm air furnaces manufactured starting on January 1, 1994, until January 1, 2023, the TE at the maximum rated capacity (rated maximum input) must be not less than 80 percent; and

(2) For gas-fired commercial warm air furnaces manufactured starting on January 1, 2023, the TE at the maximum rated capacity (rated maximum input) must be not less than 81 percent.

(b) *Oil-fired Commercial Warm Air Furnaces*. Each oil-fired commercial warm air furnace must meet the following energy efficiency standard levels:

(1) For oil-fired commercial warm air furnaces manufactured starting on January 1, 1994, until January 1, 2023, the TE at the maximum rated capacity (rated maximum input) must be not less than 81 percent; and

(2) For oil-fired commercial warm air furnaces manufactured starting on January 1, 2023, the TE at the maximum rated capacity (rated maximum input) must be not less than 82 percent.

3. Section 431.92 is amended by adding the definition of "*Double-duct air conditioner or heat pump means air-cooled commercial package air conditioning and heating equipment*" in alphabetical order to read as follows:

§ 431.92 Definitions concerning commercial air conditioners and heat pumps.

* * * * *

Double-duct air conditioner or heat pump means air-cooled commercial package air conditioning and heating equipment that—

(1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split;

(2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, as evidenced by the unit and/or all of its components being non-weatherized, including the absence of any marking (or listing) indicating compliance with UL 1995, "Heating and Cooling Equipment," or any other equivalent requirements for outdoor use;;

(3) (i) If it is a horizontal unit, a complete unit has a maximum height of 35 inches;

(ii) If it is a vertical unit, a complete unit has a maximum depth of 35 inches; and

(4) Has a rated cooling capacity greater than or equal to 65,000 Btu/h and up to 300,000 Btu/h.

* * * * *

4. Section 431.97 is amended by:

a. Revising paragraph (b) including Tables 1 through 3;

b. Redesignating Tables 4 through 8 as Tables 7 through 11;

c. Adding new Tables 4 through 6; and

d. Revising paragraph (c).

The revision and additions read as follows:

§ 431.97 Energy efficiency standards and their compliance dates.

* * * * *

(b) Each commercial air conditioner or heat pump (not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, and variable refrigerant flow systems) manufactured starting on the compliance date listed in the corresponding table must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1 through 6 of this section.

Table 1 to § 431.97—Minimum Cooling Efficiency Standards for Air Conditioning and Heating Equipment

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, and variable refrigerant flow multi-split air conditioners and heat pumps]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System)	<65,000 Btu/h	AC	All	SEER = 13	June 16, 2008.
		HP	All	SEER = 13	June 16, 2008.[1]
Small Commercial Package Air Conditioning and Heating Equipment (Air-	<65,000 Btu/h	AC	All	SEER = 13	June 16, 2008.[1]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Cooled, 3-Phase, Single-Package)					
		HP	All	SEER = 13	June 16, 2008.[1]
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 11.2	January 1, 2010.[2]
			All Other Types of Heating	EER = 11.0	January 1, 2010.[2]
		HP	No Heating or Electric Resistance Heating	EER = 11.0	January 1, 2010.[2]
			All Other Types of Heating	EER = 10.8	January 1, 2010.[2]
Large Commercial Package Air Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 11.0	January 1, 2010.[2]
			All Other Types of Heating	EER = 10.8	January 1, 2010.[2]
		HP	No Heating or Electric Resistance Heating	EER = 10.6	January 1, 2010.[2]
			All Other Types of Heating	EER = 10.4	January 1, 2010.[2]
Very Large Commercial Package Air	≥240,000 Btu/h and	AC	No Heating or Electric	EER = 10.0	January 1, 2010.[2]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Conditioning and Heating Equipment (Air-Cooled)	<760,000 Btu/h		Resistance Heating		
			All Other Types of Heating	EER = 9.8	January 1, 2010.[2]
		HP	No Heating or Electric Resistance Heating	EER = 9.5	January 1, 2010.[2]
			All Other Types of Heating	EER = 9.3	January 1, 2010.[2]
Small Commercial Package Air Conditioning and Heating Equipment (Water-Cooled)	<65,000 Btu/h	AC	All	EER = 12.1	October 29, 2003.
	≥65,000 Btu/h and <135,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 12.1	June 1, 2013.
			All Other Types of Heating	EER = 11.9	June 1, 2013.
Large Commercial Package Air-Conditioning and Heating Equipment (Water-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 12.5	June 1, 2014.
			All Other Types of Heating	EER = 12.3	June 1, 2014.
Very Large Commercial Package Air-Conditioning and	≥240,000 Btu/h and <760,000	AC	No Heating or Electric Resistance	EER = 12.4	June 1, 2014.

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Heating Equipment (Water-Cooled)	Btu/h		Heating		
			All Other Types of Heating	EER = 12.2	June 1, 2014.
Small Commercial Package Air-Conditioning and Heating Equipment (Evaporatively-Cooled)	<65,000 Btu/h	AC	All	EER = 12.1	October 29, 2003.
	≥65,000 Btu/h and <135,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 12.1	June 1, 2013.
			All Other Types of Heating	EER = 11.9	June 1, 2013.
Large Commercial Package Air-Conditioning and Heating Equipment (Evaporatively-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 12.0	June 1, 2014.
			All Other Types of Heating	EER = 11.8	June 1, 2014.
Very Large Commercial Package Air Conditioning and Heating Equipment (Evaporatively-Cooled)	≥240,000 Btu/h and <760,000 Btu/h	AC	No Heating or Electric Resistance Heating	EER = 11.9	June 1, 2014.
			All Other Types of Heating	EER = 11.7	June 1, 2014.
Small Commercial Package Air-Conditioning and	<17,000 Btu/h	HP	All	EER = 11.2	October 29, 2003.[3]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Heating Equipment (Water-Source: Water-to-Air, Water-Loop)					
	≥17,000 Btu/h and <65,000 Btu/h	HP	All	EER = 12.0	October 29, 2003.[3]
	≥65,000 Btu/h and <135,000 Btu/h	HP	All	EER = 12.0	October 29, 2003.[3]

[1] And manufactured before January 1, 2017. See Table 3 of this section for updated efficiency standards.
[2] And manufactured before January 1, 2018. See Table 3 of this section for updated efficiency standards.
[3] And manufactured before October 9, 2015. See Table 3 of this section for updated efficiency standards.

Table 2 to § 431.97—Minimum Heating Efficiency Standards for Air Conditioning and Heating Equipment
[Heat Pumps]

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System)	<65,000 Btu/h	HSPF = 7.7	June 16, 2008.[1]
Small Commercial Pacakage Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Package)	<65,000 Btu/h	HSPF = 7.7	June 16, 2008.[1]
Small Commercial Package Air Conditioning and Heating	≥65,000 Btu/h and	COP = 3.3	January 1, 2010.[2]

Equipment (Air-Cooled)	<135,000 Btu/h		
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	COP = 3.2	January 1, 2010.[2]
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <760,000 Btu/h	COP = 3.2	January 1, 2010.[2]
Small Commercial Packaged Air Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop)	<135,000 Btu/h	COP = 4.2	October 29, 2003.

[1] And manufactured before January 1, 2017. See Table 4 of this section for updated heating efficiency standards.

[2] And manufactured before January 1, 2018. See Table 4 of this section for updated heating efficiency standards.

Table 3 to § 431.97—Updates to the Minimum Cooling Efficiency Standards for Air Conditioning and Heating Equipment

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 12.9 IEER = 14.8	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 12.7 IEER = 14.6	January 1, 2018[1] January 1, 2023

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
		HP	Electric Resistance Heating or No Heating	IEER = 12.2 IEER = 14.1	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 12.0 IEER = 13.9	January 1, 2018[1] January 1, 2023
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 12.4 IEER = 14.2	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 12.2 IEER = 14.0	January 1, 2018[1] January 1, 2023
		HP	Electric Resistance Heating or No Heating	IEER = 11.6 IEER = 13.5	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 11.4 IEER = 13.3	January 1, 2018[1] January 1, 2023
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <760,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 11.6 IEER = 13.2	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 11.4 IEER = 13.0	January 1, 2018[1] January 1, 2023

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
		HP	Electric Resistance Heating or No Heating	IEER = 10.6 IEER = 12.5	January 1, 2018[1] January 1, 2023
			All Other Types of Heating	IEER = 10.4 IEER = 12.3	January 1, 2018[1] January 1, 2023
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System)	<65,000 Btu/h	AC	All	SEER = 13.0	June 16, 2008.
		HP	All	SEER = 14.0	January 1, 2017.
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Package)	<65,000Btu/h	AC	All	SEER = 14.0	January 1, 2017.
		HP	All	SEER = 14.0	January 1, 2017.
Small Commercial Packaged Air-Conditioning and Heating Equipment (Water Source: Water-to-Air,	<17,000 Btu/h	HP	All	EER = 12.2	October 9, 2015.

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Water-Loop)					
	≥17,000 Btu/h and <65,000 Btu/h	HP	All	EER = 13.0	October 9, 2015.
	≥65,000 Btu/h and <135,000Btu/h	HP	All	EER = 13.0	October 9, 2015.

[1] And manufactured before January 1, 2023.

Table 4 to § 431.97—Updates to the Minimum Heating Efficiency Standards for Air-Cooled Air Conditioning and Heating Equipment
[Heat Pumps]

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Efficiency level [1]	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-Sytem)	<65,000 Btu/h	HSPF = 8.2	January 1, 2017
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single Package)	<65,000 Btu/h	HSPF = 8.0	January 1, 2017

Equipment type	Cooling capacity	Efficiency level [1]	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop)	<135,000 Btu/h	COP = 4.3	October 9, 2015
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h	COP = 3.3 COP = 3.4	January 1, 2018[2] January 1, 2023
		COP = 3.3 COP = 3.4	January 1, 2018[2] January 1, 2023
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	COP = 3.2 COP = 3.3	January 1, 2018[2] January 1, 2023
		COP = 3.2 COP = 3.3	January 1, 2018[2] January 1, 2023
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <760,000 Btu/h	COP = 3.2	January 1, 2018
		COP = 3.2	January 1, 2018

[1] For units tested using the relevant AHRI Standards, all COP values must be rated at 47°F outdoor dry-bulb temperature for air-cooled equipment.
[2] And manufactured before January 1, 2023.

Table 5 to § 431.97—Minimum Cooling Efficiency Standards for Double-Duct Air-Conditioning and Heating Equipment

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on. . .
Small Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 11.2	January 1, 2010
			All Other Types of Heating	EER = 11.0	January 1, 2010
		HP	Electric Resistance Heating or No Heating	EER = 11.0	January 1, 2010
			All Other Types of Heating	EER = 10.8	January 1, 2010
Large Commercial Double-Duct Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 11.0	January 1, 2010
			All Other Types of Heating	EER = 10.8	January 1, 2010
		HP	Electric Resistance Heating or No Heating	EER = 10.6	January 1, 2010
			All Other Types of Heating	EER = 10.4	January 1, 2010

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on. . .
Very Large Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <300,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 10.0	January 1, 2010
			All Other Types of Heating	EER = 9.8	January 1, 2010
		HP	Electric Resistance Heating or No Heating	EER = 9.5	January 1, 2010
			All Other Types of Heating	EER = 9.3	January 1, 2010

Table 6 to § 431.97—Minimum Heating Efficiency Standards for Double-Duct Air-Cooled Air Conditioning and Heating Equipment [Heat Pumps]

Equipment type	Cooling capacity	Heating type	Efficiency level [1]	Compliance date: Equipment manufactured starting on . . .
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance Heating or No Heating	COP = 3.3	January 1, 2010
		All Other Types of Heating	COP = 3.3	January 1, 2010

Equipment type	Cooling capacity	Heating type	Efficiency level [1]	Compliance date: Equipment manufactured starting on . . .
Large Commercial Packaged Air-Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance Heating or No Heating	COP = 3.2	January 1, 2010
		All Other Types of Heating	COP = 3.2	January 1, 2010
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <300,000 Btu/h	Electric Resistance Heating or No Heating	COP = 3.2	January 1, 2010
		All Other Types of Heating	COP = 3.2	January 1, 2010

[1] For units tested using the relevant AHRI Standards, all COP values must be rated at 47°F outdoor dry-bulb temperature for air-cooled equipment.

(c) Each packaged terminal air conditioner (PTAC) and packaged terminal heat pump (PTHP) manufactured starting on January 1, 1994, but before October 8, 2012 (for standard size PTACs and PTHPs) and before October 7, 2010 (for non-standard size PTACs and PTHPs) must meet the applicable minimum energy efficiency standard level(s) set forth in Table 7 of this section. Each standard size PTAC and PTHP manufactured starting on October 8, 2012, and each non-standard size PTAC and PTHP manufactured starting on October 7, 2010, must meet the applicable minimum energy efficiency standard level(s) set forth in Table 6 of this section.

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