



DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE-2019-BT-STD-0035]

RIN 1904-AE66

Energy Conservation Program: Energy Conservation Standards for Consumer Products; Early Assessment Review; Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps

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

ACTION: Request for information; Early Assessment Review.

SUMMARY: The U.S. Department of Energy (“DOE”) is initiating an early assessment review to determine whether any new or amended standards would satisfy the relevant requirements of EPCA for a new or amended energy conservation standard for Packaged Terminal Air Conditioners (“PTACs”) and Packaged Terminal Heat Pumps (“PTHPs”). Specifically, through this request for information (“RFI”), DOE seeks data and information that could enable the agency to determine whether DOE should propose a “no new standard” determination because a more stringent standard: would not result in a significant savings of energy; is not technologically feasible; is not economically justified; or any combination of foregoing. DOE welcomes written comments from the public on any subject within the scope of this document (including those topics not specifically raised in this RFI), as well as the submission of data and other relevant concerning this early assessment review.

DATES: Written comments and information will be accepted on or before **[INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at <http://www.regulations.gov>. Follow the instructions for submitting

comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2019-BT-STD-0035, by any of the following methods:

1. *Federal eRulemaking Portal*: <http://www.regulations.gov>. Follow the instructions for submitting comments.
2. *E-mail*: PTACHP2019STD0035@ee.doe.gov. Include the docket number EERE-2019-BT-STD-0035 in the subject line of the message.
3. *Postal Mail*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 287-1445. If possible, please submit all items on a compact disc (“CD”), in which case it is not necessary to include printed copies.
4. *Hand Delivery/Courier*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L’Enfant Plaza, SW., 6th Floor, Washington, DC, 20024. Telephone: (202) 287-1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

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

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

The docket web page can be found at

<http://www.regulations.gov/#!docketDetail;D=EERE-2019-BT-STD-0035>. The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section III for information on how to submit comments through

<http://www.regulations.gov>.

FOR FURTHER INFORMATION CONTACT: Mr. Bryan Berringer, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-0371. E-mail: ApplianceStandardsQuestions@ee.doe.gov.

Ms. Amelia Whiting, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-2588. E-mail: Amelia.Whiting@Hq.Doe.Gov.

For further information on how to submit a comment or review other public comments and the docket contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by e-mail: ApplianceStandardsQuestions@ee.doe.gov.

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I. Introduction

DOE established an early assessment review process to conduct a more focused analysis of a specific set of facts or circumstances that would allow DOE to determine, based on one or more statutory criteria, a new or amended energy conservation standard is not warranted. The purpose of this review is to limit the resources, from both DOE and stakeholders, committed to rulemakings that will not satisfy the requirements of EPCA that a new or amended energy conservation standard save a significant amount of energy, and be economically justified and technologically feasible. *See* 85 FR 8626, 8653, 8654 (Feb. 14, 2020).

As part of the early assessment, DOE publishes an RFI in the *Federal Register*, announcing that DOE is considering initiating a rulemaking proceeding and soliciting comments, data, and information on whether a new or amended energy conservation standard would save a significant amount of energy and be technologically feasible and economically justified. Based on the information received in response to the RFI and DOE’s own analysis, DOE will determine whether to proceed with a rulemaking for a new or amended energy conservation standard.

If DOE makes an initial determination based upon available evidence that a new or amended energy conservation standard would not meet the applicable statutory criteria, DOE would engage in notice and comment rulemaking before issuing a final determination that new or amended energy conservation standards are not warranted. Conversely, if DOE makes an initial determination that a new or amended energy conservation standard would satisfy the applicable statutory criteria or DOE's analysis is inconclusive, DOE would undertake the preliminary stages of a rulemaking to issue a new or amended energy conservation standard. Beginning such a rulemaking, however, would not preclude DOE from later making a determination that a new or amended energy conservation standard cannot satisfy the requirements in EPCA, based upon the full suite of DOE's analyses. *See* 85 FR 8626, 8654 (Feb. 14, 2020).

A. Authority

The Energy Policy and Conservation Act ("EPCA"), as amended,¹ among other things authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C² of EPCA, added by Public Law 95-619, Title IV, Section 441(a) (42 U.S.C. 6311-6317, as codified), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This equipment includes PTACs and PTHPs, the subject of this RFI. (42 U.S.C. 6311(1)(I)) EPCA prescribed initial standards for this equipment. (42 U.S.C. 6313(a)(3))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling

¹ All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Public Law 115–270 (Oct. 23, 2018).

² For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316).

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297(a); 42 U.S.C. 6316(b)) DOE may, however, grant waivers of Federal preemption in limited instances for particular State laws or regulations, in accordance with the procedures and other provisions set forth under EPCA. (42 U.S.C. 6316(b)(2)(D))

In EPCA, Congress initially set mandatory energy conservation standards for certain types of commercial heating, air-conditioning, and water-heating equipment. (42 U.S.C. 6313(a)) Specifically, the statute sets standards for small, large, and very large commercial package air conditioning and heating equipment, PTACs and PTHPs, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, and unfired hot water storage tanks. *Id.* In doing so, EPCA established Federal energy conservation standards at levels that generally corresponded to the levels in American Society of Heating, Refrigerating and Air-Conditioning Engineers (“ASHRAE”) Standard 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings”, as in effect on October 24, 1992 (*i.e.*, “ASHRAE Standard 90.1-1989”), for each type of covered equipment listed in 42 U.S.C. 6313(a).

In acknowledgement of technological changes that yield energy efficiency benefits, Congress directed DOE through EPCA to consider amending the existing Federal energy conservation standard for each type of equipment listed, each time ASHRAE amends Standard 90.1 with respect to such equipment. (42 U.S.C. 6313(a)(6)(A)) When triggered in this manner, DOE must undertake and publish an analysis of the energy savings potential of amended energy efficiency standards, and amend the Federal standards to establish a uniform national standard at

the level specified in the amended ASHRAE Standard 90.1, unless DOE determines that there is clear and convincing evidence to support a determination that a more-stringent standard level as a national standard would produce significant additional energy savings and be technologically feasible and economically justified.³ (42 U.S.C. 6313(a)(6)(A)(ii)) If DOE decides to adopt as a national standard the minimum efficiency levels specified in the amended ASHRAE Standard 90.1, DOE must establish such standard not later than 18 months after publication of the amended industry standard. (42 U.S.C. 6313(a)(6)(A)(ii)(I)) However, if DOE determines, supported by clear and convincing evidence, that a more-stringent uniform national standard would result in significant additional conservation of energy and is technologically feasible and economically justified, then DOE must establish such more-stringent uniform national standard not later than 30 months after publication of the amended ASHRAE Standard 90.1. (42 U.S.C. 6313(a)(6)(A)(ii)(II) and (B))

In those situations where ASHRAE has not acted to amend the levels in Standard 90.1 for the equipment types enumerated in the statute, EPCA provides for a 6-year-lookback to consider the potential for amending the uniform national standards. (42 U.S.C. 6313(a)(6)(C)) Specifically, pursuant to EPCA, DOE is required to conduct an evaluation of each class of covered equipment in ASHRAE Standard 90.1 “every 6 years” to determine whether the applicable energy conservation standards need to be amended. (42 U.S.C. 6313(a)(6)(C)(i)) DOE must publish either a NOPR to propose amended standards or a notice of determination

³ In determining whether a more-stringent standard is economically justified, EPCA directs DOE to determine, after receiving views and comments from the public, whether the benefits of the proposed standard exceed the burdens of the proposed standard by, to the maximum extent practicable, considering the following:

- (1) The economic impact of the standard on the manufacturers and consumers of the products subject to the standard;
 - (2) The savings in operating costs throughout the estimated average life of the product compared to any increases in the initial cost or maintenance expense;
 - (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 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 considers relevant.
- (42 U.S.C. 6313(a)(6)(B)(ii))

that existing standards do not need to be amended. (42 U.S.C. 6313(a)(6)(C)) In making a determination, DOE must evaluate whether amended standards would result in significant additional conservation of energy and are technologically feasible and economically justified. (42 U.S.C. 6313(a)(6)(C)(i)(I); 42 U.S.C. 6313(a)(6)(A)) In proposing new standards under the 6-year review, DOE must undertake the same considerations as if it were adopting a standard that is more stringent than an amendment to ASHRAE Standard 90.1. (42 U.S.C. 6313(a)(6)(C)(i)(II)) This is a separate statutory review obligation, as differentiated from the obligation triggered by an ASHRAE Standard 90.1 amendment. While the statute continues to defer to ASHRAE's lead on covered equipment subject to Standard 90.1, it does allow for a comprehensive review of all such equipment and the potential for adopting more-stringent standards, where supported by the requisite clear and convincing evidence. That is, DOE interprets ASHRAE's not amending Standard 90.1 with respect to a product or equipment type as ASHRAE's determination that the standard applicable to that product or equipment type is already at an appropriate level of stringency, and DOE will not amend that standard unless there is clear and convincing evidence that a more stringent level is justified.

As a preliminary step in the process of reviewing the standards for PTACs and PTHPs, DOE is requesting data and information pursuant to the 6-year-lookback review. (42 U.S.C. 6313(a)(6)(C)) Such information will help DOE inform its decisions, consistent with its obligations under EPCA.

B. Rulemaking History

On July 21, 2015, DOE published amendments to the PTAC and PTHP standards in response to the 2013 update to ASHRAE Standard 90.1 (*i.e.*, "ASHRAE Standard 90.1-2013"). 80 FR 43162 ("July 2015 Final Rule"). DOE determined that ASHRAE Standard 90.1-2013 amended the standards for three of the 12 PTAC and PTHP equipment classes: PTAC Standard

Size <7,000 Btu/h, PTAC Standard Size $\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h, and PTAC Standard Size > 15,000 Btu/h. 80 FR 43162, 43163. DOE adopted the standard levels for the three equipment classes as updated by ASHRAE Standard 90.1. *Id.* Compliance with the amended standards was required as of January 1, 2017. *Id.* DOE did not amend the energy conservation standards for the remaining equipment classes which were already equivalent to the standards in ASHRAE Standard 90.1–2013. *Id.* DOE was unable to show with clear and convincing evidence that energy conservation standards at levels more stringent than the minimum levels specified in the ASHRAE Standard 90.1-2013 for any of the 12 equipment classes would be economically justified. *Id.* The current energy conservation standards are located in Title 10 Code of Federal Regulations (“CFR”) section 431.97, Table 8.

DOE's current test procedures for PTACs and PTHPs were established in a final rule on June 30, 2015. 80 FR 37136. The current test procedure for cooling mode testing incorporates by reference Air-Conditioning, Heating, and Refrigeration Institute (“AHRI”) Standard 310/380-2014, “Standard for Packaged Terminal Air-Conditioners and Heat Pumps” (“AHRI 310/380-2014”), with the following sections applicable to the DOE test procedure: sections 3, 4.1, 4.2, 4.3, and 4.4. In addition to the specified provisions of AHRI 310/380-2014, the PTACs and PTHPs must be tested according to either American National Standards Institute (“ANSI”)/ASHRAE 16-1983 (RA 2014), “Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners” (“ANSI/ASHRAE 16-1983 (RA 2014)”), or ANSI/ASHRAE 37-2009, “Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment” (“ANSI/ASHRAE 37-2009”). The current test procedure for heating mode testing incorporates by reference AHRI Standard 310/380-2014, with the following sections applicable to the DOE test procedure: sections 3, 4.1, 4.2 (except section 4.2.1.2(b)), 4.3, and 4.4; and ANSI/ASHRAE 58-1986 (RA 2014), “Method of Testing for Rating Room Air-Conditioner and Packaged Terminal Air-Conditioner Heating Capacity”

(“ANSI/ASHRAE 58-1986 (RA 2014)”). (10 CFR 431.96(g)) The currently applicable DOE test procedures for PTACs and PTHPs appear at 10 CFR 431.96 in paragraph (g).

The current test procedure also requires that manufacturers adhere to additional provisions in paragraphs (c) and (e) of 10 CFR 431.96. (10 CFR 431.96(b)(1)) Paragraph (c) of 10 CFR 431.96 includes provisions for an optional compressor break-in period, while paragraph (e) of 10 CFR 431.96 clarifies what information sources can be used for unit set-up and provides specific set-up instructions for refrigerant parameters (*e.g.* superheat) and air flow rate.

ASHRAE Standard 90.1 has been updated since the 2013 version, most recently with the release of the 2019 version (*i.e.*, ANSI/ASHRAE/IES Standard 90.1-2019, “Energy Efficiency Standard for Buildings Except Low-Rise Residential Buildings”) on October 24, 2019.

However, the standard levels for PTACs and PTHPs remain unchanged from the 2013 version.

II. Request for Information and Comments

DOE is publishing this RFI to collect data and information during the early assessment review to inform its decision, consistent with its obligations under EPCA, as to whether the Department should proceed with an energy conservation standards rulemaking. Accordingly, in the following sections, DOE has identified specific issues on which it seeks input to aid in its analysis of whether an amended standard for PTAC or PTHP would not save a significant amount of energy or be technologically feasible or economically justified. In particular, DOE is interested in any information indicating that there has been sufficient technological or market changes since DOE last conducted an energy conservation standards rulemaking analysis for PTAC or PTHPs to suggest a more-stringent standard could satisfy these criteria. DOE also welcomes comment on other issues relevant to its early assessment that may not specifically identified in this document.

Pursuant to DOE's recently amended "Process Rule" (85 FR 8626; Feb. 14, 2020), DOE stated that as a first step in a proceeding to consider establishing or amending an energy conservation standard, such as the existing standards for PTACs and PTHP at issue in this document, DOE would publish a notice in the *Federal Register* announcing that DOE is considering initiation of a proceeding, and as part of that notice, DOE would request submission of related comments, including data and information showing whether any new or amended standard would satisfy the relevant requirements in EPCA for a new or amended energy conservation standard. Based on the information received in response to the notice and its own analysis, DOE would determine whether to proceed with a rulemaking for a new or amended standard, or issue a proposed determination that the standards do not need to be amended.

As discussed, DOE is required to conduct an evaluation of each class of covered equipment in ASHRAE Standard 90.1 every 6 years. (42 U.S.C. 6313(a)(6)(C)(i)) In making a determination of whether standards for such equipment need to be amended, DOE must follow specific statutory criteria. DOE must evaluate whether amended Federal standards would result in significant additional conservation of energy and are technologically feasible and economically justified. (42 U.S.C. 6313(a)(6)(C)(i)(I) (referencing 42 U.S.C. 6313(a)(6)(A)(ii)(II))) To determine whether a standard is economically justified, EPCA requires that DOE determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

1. The economic impact of the standard on 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)(C)(i)(II), referencing 42 U.S.C. 6313(a)(6)(B)(ii))

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

Table I.1 EPCA Requirements and Corresponding DOE Analysis

EPCA Requirement	Corresponding DOE Analysis
Significant Energy Savings	<ul style="list-style-type: none"> • Shipments Analysis • National Impact Analysis • Energy and Water Use Determination
Technological Feasibility	<ul style="list-style-type: none"> • Market and Technology Assessment • Screening Analysis • Engineering Analysis
Economic Justification:	
1. Economic impact on manufacturers and consumers	<ul style="list-style-type: none"> • Manufacturer Impact Analysis • Life-Cycle Cost and Payback Period Analysis • Life-Cycle Cost Subgroup Analysis • Shipments Analysis
2. Lifetime operating cost savings compared to increased cost for the product	<ul style="list-style-type: none"> • Markups for Product Price Determination • Energy and Water Use Determination • Life-Cycle Cost and Payback Period Analysis
3. Total projected energy savings	<ul style="list-style-type: none"> • Shipments Analysis • National Impact Analysis
4. Impact on utility or performance	<ul style="list-style-type: none"> • Screening Analysis • Engineering Analysis
5. Impact of any lessening of competition	<ul style="list-style-type: none"> • Manufacturer Impact Analysis
6. Need for national energy and water conservation	<ul style="list-style-type: none"> • Shipments Analysis • National Impact Analysis
7. Other factors the Secretary considers relevant	<ul style="list-style-type: none"> • Employment Impact Analysis • Utility Impact Analysis • Emissions Analysis • Monetization of Emission Reductions Benefits • Regulatory Impact Analysis

As noted in Section I.A., DOE is publishing this early assessment review RFI to collect data and information that could enable the agency to determine whether DOE should propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

A. Equipment Covered by This Process

This RFI covers equipment that meets the definitions of PTACs and PTHPs, as codified at 10 CFR 431.92. The definitions for PTACs and PTHPs were established under EPCA and codified in a test procedure final rule issued October 21, 2004. (42 U.S.C. 6311(10)); 69 FR 61962, 61970.

DOE defines “packaged terminal air conditioners” as a wall sleeve and a separate un-encased combination of heating and cooling assemblies specified by the builder and intended for mounting through the wall, and that is industrial equipment. It includes a prime source of refrigeration, separable outdoor louvers, forced ventilation, and heating availability by builder's choice of hot water, steam, or electricity. (10 CFR 431.92)

DOE defines “packaged terminal heat pumps” as a packaged terminal air conditioner that utilizes reverse cycle refrigeration as its prime heat source, that has a supplementary heat source available, with the choice of hot water, steam, or electric resistant heat, and that is industrial equipment. *Id.*

On October 7, 2008, DOE published a final rule amending the energy conservation standards for PTACs and PTHPs in which DOE divided equipment classes based on whether a PTAC or PTHP is a standard size or non-standard size. 73 FR 58772 (“October 2008 Final Rule”).

DOE defines “standard size” as a PTAC or PTHP with wall sleeve dimensions having an external wall opening of greater than or equal to 16 inches high or greater than or equal to 42 inches wide, and a cross-sectional area greater than or equal to 670 square inches. (10 CFR 431.92)

DOE defines “non-standard size” as a PTAC or PTHP with existing wall sleeve dimensions having an external wall opening of less than 16 inches high or less than 42 inches wide, and a cross-sectional area less than 670 square inches. *Id.*

Issue 1: DOE requests comment on whether the definitions for PTACs and PTHPs require any revisions – and if so, DOE requests information on why revisions are needed and how those definitions should be revised. DOE also requests feedback on whether the sub-category definitions currently in place for standard size and non-standard size are appropriate or whether further modifications are needed. If these sub-category definitions need modifying, DOE seeks specific input on how to define these terms and information to support any such changes.

Issue 2: DOE requests comment on whether additional equipment definitions are necessary to close any potential gaps in coverage between equipment types. DOE also seeks input on whether such equipment currently exist in the market or whether they are being planned for introduction. DOE also requests comment on opportunities to combine equipment classes that could reduce regulatory burden.

B. Market and Technology Assessment

The market and technology assessment that DOE routinely conducts when analyzing the impacts of a potential new or amended energy conservation standard provides information about the PTACs and PTHPs industry that will be used to determine whether DOE should propose a “no new standard” determination. DOE uses qualitative and quantitative information to characterize the structure of the industry and market. DOE identifies manufacturers, estimates market shares and trends, addresses regulatory and non-regulatory initiatives intended to improve

energy efficiency or reduce energy consumption, and explores the potential for efficiency improvements in the design and manufacturing of PTACs and PTHPs. DOE also reviews product literature, industry publications, and company websites. Additionally, DOE considers conducting interviews with manufacturers to improve its assessment of the market and available technologies for PTACs and PTHPs.

1. Energy Efficiency Descriptor

For PTACs and PTHPs, DOE currently prescribes energy efficiency ratio (“EER”) as the cooling mode efficiency metric and coefficient of performance (“COP”) as the heating mode efficiency metric. (10 CFR 431.96) These energy efficiency descriptors are the same as those included in ASHRAE 90.1-2016 for PTACs and PTHPs. EER is the ratio of the produced cooling effect of the PTAC or PTHP to its net work input, expressed in Btu/watt-hour, and measured at standard rating conditions. COP is the ratio of the produced heating effect of the PTHP to its net work input, when both are expressed in identical units of measurement, and measured at standard rating conditions. DOE’s test procedure for PTACs and PTHPs does not include a seasonal metric that includes part-load performance.

On December 8, 2020, DOE published an RFI (the “December 2020 TP RFI”) to collect information and data to consider amendments to DOE’s test procedure for PTACs and PTHPs. 85 FR 78967. As part of the December 2020 TP RFI, DOE requested comment on whether it should consider adopting for PTACs and PTHPs a cooling-mode metric that integrates part-load performance to better represent full-season efficiency. 85 FR 78967. In the December 2020 TP RFI, DOE discusses in detail three possible part-load efficiency metrics that are used for rating other categories of commercial package air conditioning and heating equipment:

- Integrated energy efficiency ratio (“IEER”), as described in section 6.2 of AHRI Standard 340/360 (I/P)-2019, “2019 Standard for Performance Rating of Commercial

and Industrial Unitary Air-Conditioning and Heat Pump Equipment ”,

- Seasonal energy efficiency ratio (“SEER”), as described in Appendix M to Subpart B of 10 CFR part 430, and
- Weighted-average combined energy efficiency ratio (“CEER”), as described in a Decision and Order granting a petition for waiver for certain room air conditioners. See 84 FR 20111, 20113 (May 8, 2019).

If DOE amends the PTAC and PTHP test procedure to incorporate a part-load metric, it would conduct any analysis for future standards rulemakings, if any, based on the amended test procedure.

2. Equipment Classes

For PTACs and PTHPs, the current energy conservation standards specified in 10 CFR 431.97(c) are based on 12 equipment classes determined according to the following: whether the equipment is an air conditioner or a heat pump, whether the equipment is standard size or non-standard size, and cooling capacity in British thermal unit per hour (“Btu/h”). Table II.1 lists the current 12 equipment classes for PTACs and PTHPs outlined in Table 7 to 10 CFR 431.97.

Table II.1 Current PTAC and PTHP Equipment Classes

Equipment Class			
1	PTAC	Standard Size	<7,000 Btu/h
2	PTAC	Standard Size	≥7,000 Btu/h and ≤15,000 Btu/h
3	PTAC	Standard Size	>15,000 Btu/h
4	PTAC	Non-Standard Size	<7,000 Btu/h
5	PTAC	Non-Standard Size	≥7,000 Btu/h and ≤15,000 Btu/h
6	PTAC	Non-Standard Size	>15,000 Btu/h
7	PTHP	Standard Size	<7,000 Btu/h
8	PTHP	Standard Size	≥7,000 Btu/h and ≤15,000 Btu/h
9*	PTHP	Standard Size	>15,000 Btu/h
10	PTHP	Non-Standard Size	<7,000 Btu/h

Equipment Class			
11	PTHP	Non-Standard Size	$\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h
12	PTHP	Non-Standard Size	$> 15,000$ Btu/h
*Based on DOE's review of equipment currently available on the market, DOE did not identify any Standard Size PTHP models with a cooling capacity greater than 15,000 Btu/h.			

Issue 3: DOE requests feedback on the current PTAC and PTHP equipment classes and whether changes to these individual equipment classes and their descriptions should be made or whether certain classes should be merged or separated. Specifically, DOE requests comment on opportunities to combine equipment classes that could reduce regulatory burden. DOE further requests feedback on whether combining certain classes could impact equipment utility by eliminating any performance-related features or impact the stringency of the current energy conservation standard for these equipment. DOE also requests comment on separating any of the existing equipment classes and whether it would impact equipment utility by eliminating any performance-related features or reduce any compliance burdens.

a. "Make-Up Air" PTACs and PTHPs

As part of the December 2020 TP RFI, DOE described "make-up air" PTACs and their additional function of dehumidification. 85 FR 78967. As discussed in section II.B.1, for PTACs and PTHPs, DOE currently specifies EER as the test metric for cooling efficiency. For PTHPs, DOE specifies COP as the test metric for heating efficiency. Neither the current test procedure, 10 CFR 431.96, nor the industry test procedure, AHRI Standard 310/380-2014, account for the energy associated with the conditioning of make-up air introduced by the unit.

If DOE amends the PTAC and PTHP test procedure to incorporate measurement of dehumidification energy for "make-up air" PTACs and PTHPs, a separate equipment class for

this type of units may be warranted. DOE would conduct any analysis for future standards rulemakings, if any, based on the amended test procedure.

Issue 4: DOE requests comment on how a “make-up air PTAC” and a “make-up air PTHP” could be defined, and what characteristics could be used to distinguish make-up air PTACs and PTHPs from other PTACs and PTHPs. DOE requests information on the consumer utility provided by a PTAC or PTHP that provides make-up air. DOE also requests information and data on the associated energy use associated with the function of providing “make-up air.” DOE also requests comment on if the same capacity ranges used for non-“make-up air” PTACs and PTHPs would be appropriate to use for equipment classes for possible “make-up air” PTAC and PTHP equipment classes (i.e. $<7,000$ Btu/h, $\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h, and $>15,000$ Btu/h). Finally, DOE requests comment on if there are both Standard Size and Non-Standard Size “make-up air” PTACs and PTHPs.

Issue 5: DOE seeks information regarding any other new product classes it should consider for inclusion in its analysis. Specifically, DOE requests information on the performance-related features that provide unique consumer utility and data detailing the corresponding impacts on energy use that would justify separate product classes (i.e., explanation for why the presence of these performance-related features would increase energy consumption).

3. Review of Current Market

To inform its evaluation of PTACs and PTHPs, DOE initially reviewed data in the DOE Compliance Certification Database⁴ (“CCMS database”) to characterize the distribution of

⁴ DOE’s Compliance Certification Database can be found at <https://www.regulations.doe.gov/certification-data/products.html> (accessed September 26th, 2019).

efficiencies for PTAC and PTHP equipment currently available on the market, analyzing cooling and heating efficiency separately. DOE is making available for comment a document that provides the distributions of EER and COP for PTACs and PTHPs in the 11 equipment classes listed in Table II.1 for which DOE has identified models on the market⁵ (see Docket No. EERE-2019-BT-STD-0035-0001).

Based on the data shown in the supplemental file DOE has made available for comment (see Docket No. EERE-2019-BT-STD-0035-0001), DOE requests feedback on whether using the current established energy conservation standards for PTACs and PTHPs are appropriate baseline efficiency levels for DOE to apply to each equipment class in evaluating whether to amend the current energy conservation standards for this equipment.

4. Technology Assessment

In analyzing information to determine whether DOE should propose a “no new standards determination” for existing PTAC and PTHPs standards, DOE uses information about existing and past technology options and prototype designs to help identify technologies that manufacturers could use to meet and/or exceed a given set of energy conservation standards under consideration. In consultation with interested parties, DOE intends to develop a list of technologies to consider in its analysis. That analysis will likely include a number of the technology options DOE previously analyzed during its most recent rulemaking for PTACs and PTHPs, technology options DOE identified but did not analyze, and newer technology options that DOE may also consider in a future PTAC and PTHP energy conservation standards rulemaking. Based on the technologies identified in the analysis for the July 2015 Final Rule and a preliminary survey of the current market, DOE has separately provided potential

⁵ As noted in Table II.1, DOE did not identify any Standard Size PTHP models with a cooling capacity greater than 15,000 Btu/h.

technology options in two categories: technologies that may increase efficiency at both full-load and part-load conditions, listed in Table II.2; and technologies that may only increase efficiency at part-load conditions, listed in Table II.3.

Table II.2 Technology Options for PTACs and PTHPs That May Increase Efficiency at Both Full-Load and Part-Load Conditions

Technology Options		Source
Heat Exchanger Improvements	Increased Heat Exchanger Area	July 2015 Final Rule
Indoor Blower and Outdoor Fan Improvements	Higher Efficiency Fan Motors	July 2015 Final Rule
	Improved Air Flow and Fan Design	July 2015 Final Rule
	More efficient fan geometries	New Technology Option
Compressor Improvements	Higher Efficiency Compressors	July 2015 Final Rule
	Scroll Compressors	Screened out of July 2015 Final Rule
Other Improvements	Heat Pipes	Screened out of July 2015 Final Rule
	Alternative Refrigerants	Screened out of July 2015 Final Rule

Table II.3 Technology Options for PTACs and PTHPs That May Increase Efficiency at Only Part-Load Conditions

Technology Options		Source
Indoor Blower and Outdoor Fan Improvements	Variable speed condenser fan/motor	New Technology Option
	Variable speed indoor blower/motor	New Technology Option
Compressor Improvements	Variable Speed Compressors	July 2015 Final Rule*
Other Improvements	Electronic Expansion Valves (“EEV”)	New Technology Option
	Thermal Expansion Valves (“TEV”)	July 2015 Final Rule*

*Identified technology not analyzed because no full-load benefit.

Issue 6: DOE seeks information on the technologies listed in Table II.2 regarding their applicability to the current market and how these technologies may impact the efficiency of PTACs and PTHPs as measured according to the DOE test procedure. DOE also seeks information on how those technologies identified in development of the July 2015 Final Rule may have changed since that time. Specifically, DOE seeks information on the range of efficiencies or performance characteristics that are currently available for each technology option.

Issue 7: DOE seeks comment on whether this new technology would affect a determination as to whether DOE could propose a “no new standard” determination because a more stringent standard: would not result in a significant savings of energy; is not technologically feasible; is not economically justified; or any combination of the foregoing. Specifically, DOE seeks information on the new technologies listed in Table II.2 and Table II.3 of this RFI regarding their market adoption, costs, and any concerns with incorporating them into equipment (e.g., impacts on consumer utility, potential safety concerns, manufacturing/production/implementation issues, etc.), particularly as to changes that may have occurred since the July 2015 Final Rule.

Issue 8: DOE seeks comment on other technology options that it should consider for inclusion in its analysis and if these technologies may impact equipment features or consumer utility.

As discussed in section II.B.1 of this RFI, DOE may consider adopting for PTACs and PTHPs a cooling-mode metric that integrates part-load performance.

TEVs and EEVs regulate the flow of liquid refrigerant entering the evaporator and can

adapt to changes in operating conditions, such as variations in temperature, humidity, and compressor staging. As a result, TEVs and EEVs can control for optimum system operating parameters over a wide range of operating conditions and are a consideration in evaluating improved seasonal efficiency. Variable-speed compressors enable modulation of the refrigeration system cooling capacity, allowing the unit to match the cooling or heating load. This modulation can improve efficiency by reducing off-cycle losses and can improve heat exchanger effectiveness at part-load conditions by operating at a lower mass flow rate. Variable speed condenser fan motors and variable speed indoor blower motors would likewise not have a measured impact on energy consumption based on the current test procedure. These technologies allow for varying fan speed to reduce airflow rate at part-load operation, which is not accounted for under the current metric.

Issue 9: In the event DOE were to amend the metric for the PTAC and PTHP standards to account for part-load performance, DOE requests data on the market penetration and efficiency improvement associated with the technology options listed in Table II.3. In addition, DOE requests data on any other technology options not listed above that would improve the efficiency of equipment under part-load conditions.

C. Screening Analysis

The purpose of the screening analysis is to evaluate the technologies that improve equipment efficiency to determine which technologies will be eliminated from further consideration and which will be passed to the engineering analysis for further consideration. In this early assessment RFI, DOE seeks data and information with respect to technologies previously screened out or retained that could enable the agency to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically

justified; or (4) any combination of the foregoing.

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

- (1) *Technological feasibility.* Technologies that are not incorporated in commercial product or in working prototypes will not be considered further.
- (2) *Practicability to manufacture, install, and service.* If it is determined that mass production of a technology in commercial product and reliable installation and servicing of the technology could not be achieved on the scale necessary to serve the relevant market at the time of the compliance date of the standard, then that technology will not be considered further.
- (3) *Impacts on equipment utility or equipment availability.* If a technology is determined to have significant adverse impact on the utility of the equipment to significant subgroups of consumers, or result in the unavailability of any covered equipment type with performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as equipment generally available in the United States at the time, it will not be considered further.
- (4) *Adverse impacts on health or safety.* If it is determined that a technology will have significant adverse impacts on health or safety, it will not be considered further.
- (5) *Unique-Pathway Proprietary Technologies.* If a design option utilizes proprietary technology that represents a unique pathway to achieving a given efficiency level, that technology will not be considered further, due to the potential for monopolistic concerns.

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

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

Table II.4 summarizes the technology options that DOE screened out in the July 2015 Final Rule, and the applicable screening criteria.

Table II.4 Previously Screened Out Technology Options from the July 2015 Final Rule

Screened Technology Option	Technological Feasibility	Screening Criteria (X = Basis for Screening Out)			
		Practicability to Manufacture, Install, and Service	Adverse Impact on Equipment Utility	Adverse Impacts on Health and Safety	Unique-Pathway Proprietary Technologies
Scroll Compressors	X				
Heat Pipes	X				
Alternative Refrigerants	X				

Issue 10: With respect to the screened out technology options listed in Table II.4 of this RFI, DOE seeks information on whether these options would, based on current and projected assessments regarding each of them, remain screened out under the four screening criteria described in this section. With respect to each of these technology options, what steps, if any, could be (or have already been) taken to facilitate the introduction of each option as a means to improve the energy performance of PTACs and PTHPs and the potential to impact consumer utility of the PTACs and PTHPs.

In development of the July 2015 Final Rule, DOE identified two technology options that were not included in the engineering analysis because efficiency benefits of the technologies were negligible:

- Re-Circuiting Heat Exchanger Coils and
- Rifled Interior Tube Walls.

80 FR 43162, 43172. In addition, DOE did not consider the following technology for the engineering analysis because there was not data available to evaluate the energy efficiency characteristics of the technology:

- Microchannel Heat Exchanger.

Id. Finally, DOE did not consider the following technologies for the engineering analysis because the test procedure and EER and COP metrics do not measure the energy impact of the technology:

- Complex Control Boards,
- Clutched Fan Motors,
- TEVs,
- Variable Speed Compressors,
- Corrosion Protection, and
- Hydrophobic Material Treatment of Heat Exchangers.

Id.

Issue 11: With respect to the additional technologies identified in development of the July 2015 Final Rule but not included in the engineering analysis, DOE seeks comment on its prior exclusion of these technologies and whether there have been changes that would warrant further consideration.

D. Engineering Analysis

The engineering analysis estimates the cost-efficiency relationship of equipment at

different levels of increased energy efficiency (“efficiency levels”). This relationship serves as the basis for the cost-benefit calculations for consumers, manufacturers, and the Nation. In determining the cost-efficiency relationship, DOE estimates the increase in manufacturer production costs (“MPCs”) associated with increasing the efficiency of equipment above the baseline, up to the maximum technologically feasible (“max-tech”) efficiency level for each equipment class. In this early assessment review RFI, DOE seeks data and information with respect to these cost-benefit calculations that could enable the agency to determine whether to propose a “no new standards” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

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

1. Baseline Efficiency Levels

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

If it determines that a rulemaking is necessary, consistent with this analytical approach, DOE tentatively plans to consider the current minimum energy conservation standards⁶ to establish the baseline efficiency levels for each equipment class. As discussed in section II.B.1 of this document, the current standards for PTACs and PTHPs are based on the full-load metrics, EER and COP. The current standards for PTACs and PTHPs are found at 10 CFR 431.97 and are presented in Table II.5 of this document.

Table II.5 Current PTAC and PTHP Energy Conservation Standard Levels

Equipment Class				Minimum Energy Conservation Standard Level
1	PTAC	Standard Size	<7,000 Btu/h	EER = 11.9
2	PTAC	Standard Size	$\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h	EER = $14.0 - (0.3 \times \text{Cap}^1)$
3	PTAC	Standard Size	>15,000 Btu/h	EER = 9.5
4	PTAC	Non-Standard Size	<7,000 Btu/h	EER = 9.4
5	PTAC	Non-Standard Size	$\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h	EER = $10.9 - (0.213 \times \text{Cap}^1)$
6	PTAC	Non-Standard Size	>15,000 Btu/h	EER = 7.7
7	PTHP	Standard Size	<7,000 Btu/h	EER = 11.9 COP = 3.3
8	PTHP	Standard Size	$\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h	EER = $14.0 - (0.3 \times \text{Cap}^1)$ COP = $3.7 - (0.052 \times \text{Cap}^1)$
9	PTHP ²	Standard Size	>15,000 Btu/h	EER = 9.5 COP = 2.9
10	PTHP	Non-Standard Size	<7,000 Btu/h	EER = 9.3 COP = 2.7
11	PTHP	Non-Standard Size	$\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h	EER = $10.8 - (0.213 \times \text{Cap}^1)$ COP = $2.9 - (0.026 \times \text{Cap}^1)$
12	PTHP	Non-Standard Size	>15,000 Btu/h	EER = 7.6 COP = 2.5

⁶ The current standards for Standard Size PTACs at all cooling capacities are applicable to equipment manufactured on or after January 1, 2017. The current standards for Standard Size PTHPs at all cooling capacities are applicable to equipment manufactured on or after October 8, 2012. The current standards for all Non-Standard Size PTACs and PTHPs are applicable to equipment manufactured on or after October 7, 2010.

Equipment Class	Minimum Energy Conservation Standard Level
<ol style="list-style-type: none"> 1. Cap means cooling capacity in thousand Btu/h 2. Based on DOE's review of equipment currently available on the market, DOE did not identify any Standard Size PTHP models with a cooling capacity greater than 15,000 Btu/h. 	

2. Maximum Available and Maximum Technologically Feasible Levels

As part of DOE's analysis, the maximum available efficiency level is the highest efficiency unit currently available on the market. DOE also considers the max-tech efficiency level, which it defines as the level that represents the theoretical maximum possible efficiency if all available design options are incorporated in a model. In many cases, the max-tech efficiency level is not commercially available because it is not economically feasible.

For the July 2015 Final Rule, DOE determined the max-tech improvements in energy efficiency for PTACs and PTHPs in the engineering analysis using the design parameters that passed the screening analysis, a combination of the efficiency-level approach, and the reverse engineering approach. 80 FR 43162, 43173. In addition, DOE surveyed the rated efficiencies of PTACs listed in the AHRI Directory to determine that the maximum efficiency units extended up to 17.5 percent above the ANSI/ASHRAE Standard 90.1-2013 baseline. *Id.* at 80 FR 43175. In the July 2015 Final Rule DOE maintained the standard levels for non-standard size PTAC and PTHP equipment finding that because of the small and declining number of shipments in each of the non-standard size equipment classes, clear and convincing evidence was lacking to support more stringent standards. *Id.* at 80 FR 43167. DOE only analyzed the six standard size equipment classes for PTACs and PTHPs for the engineering analysis. *Id.* at 80 FR 43174. For additional details regarding the engineering analysis conducted for the July 2015 Final Rule see Chapter 5 of the July 2015 Final Rule Technical Support Document ("TSD").⁷

⁷ The July 2015 Final Rule TSD is available at: <https://www.regulations.gov/document?D=EERE-2012-BT-STD-0029-0040>.

Issue 12: DOE seeks comment on whether the technology improvements listed in Table II.2 and Table II.3 of this RFI are applicable to both standard size and non-standard size units and if they have similar impacts on efficiency.

Issue 13: DOE requests comment on whether it is necessary to individually analyze all or some of the available equipment classes.

Table II.6 shows the max-tech efficiency levels considered for the July 2015 Final Rule, which were assumed to be 16.2 percent above the baseline, and the maximum-available based on the current market for each equipment classes. To develop preliminary maximum-available linear equations for both standard size PTAC and standard size PTHP $\geq 7,000$ Btu/h and $\leq 15,000$ Btu/h, DOE created a linear fit between the two models in the CCMS Database that were the

highest absolute value above the baseline.⁸ This ensures that all models are either at or below this line.

Table II.6 Max-tech and Maximum-Available Efficiency Levels

Equipment Class	Max-tech July 2015 Final Rule	Maximum-Available Current Market
Standard Size PTAC <7,000 Btu/h	13.8 EER ^a	13.0 EER
Standard Size PTAC ≥7,000 Btu/h and ≤15,000 Btu/h	$EER = 16.3 - (0.354 \times Cap^b)$	$EER = 15.8 - (0.308 \times Cap^b)^c$
Standard Size PTAC >15,000 Btu/h	11.0 EER	9.7 EER
Standard Size PTHP <7,000 Btu/h	13.8 EER ^a 3.8 COP ^a	13.1 EER 4.0 COP
Standard Size PTHP ≥7,000 Btu/h and ≤15,000 Btu/h	$EER = 16.3 - (0.354 \times Cap^b)$ $COP = 4.3 - (0.073 \times Cap^b)$	$EER = 15.8 - (0.308 \times Cap^b)^c$ $COP = 4.6 - (0.075 \times Cap^b)^c$
Standard Size PTHP >15,000 Btu/h ³	11.0 EER 3.2 COP	N/A ^d

a. Based on Max Tech equation shown in Table IV.4 of the July 2015 Final Rule at 7,000 Btu/h.
b. Cap means cooling capacity in thousand Btu/h
c. Based on method of creating a linear fit between the two models in the CCMS Database that were the highest absolute value above the baseline.
d. Based on DOE’s review of equipment currently available on the market, DOE did not identify any PTHP models with a cooling capacity greater than 15,000 Btu/h.

Issue 14: DOE seeks input on whether the maximum available efficiency levels are appropriate as the max-tech for potential consideration as possible energy conservation standards for the equipment at issue – and if not, what efficiency levels should be considered max-tech?

Issue 15: DOE seeks feedback on what design options would be incorporated at a max-tech efficiency level. As part of this request, DOE also seeks information as to whether there are limitations on the use of certain combinations of design options.

⁸ The preliminary maximum-available linear equations were calculated with the following models. For standard size PTACs ≥7,000 Btu/h and ≤15,000 Btu/h, these two models were rated at 9,700 Btu/h, 12.8 EER and 14,900 Btu/h, 11.2 EER. For standard size PTHPs ≥7,000 Btu/h and ≤15,000 Btu/h cooling efficiency, these two models were rated at 9,700 Btu/h, 12.8 EER and 14,900 Btu/h, 11.2 EER. For standard size PTHPs ≥7,000 Btu/h and ≤15,000 Btu/h heating efficiency, these two models were rated at 7,000 Btu/h, 4.0 COP and 8,500 Btu/h, 3.8 COP.

As discussed in section II.B.1 of this document, if DOE were to amend the PTAC and PTHP test procedure to incorporate a seasonal metric, it would conduct any analysis for future standards rulemaking based on the amended test procedure, including considering efficiency levels based on a seasonal metric.

Issue 16: DOE seeks data and information regarding incremental and maximum-available efficiency levels for each equipment class under seasonal energy efficiency metrics. In particular, DOE seeks energy use data for equipment operating at part-load capacities, for example, at the part-load test conditions specified in AHRI Standard 340/360 (I/P)-2019, 2019 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment. In addition, DOE requests information on the technologies for improving part-load operation, including the order in which manufacturers would likely add such technologies.

3. Manufacturer Production Costs and Manufacturing Selling Price

As described at the beginning of this section, the main outputs of the engineering analysis are cost-efficiency relationships that describe the estimated increases in manufacturer production cost associated with higher-efficiency equipment for the analyzed equipment classes. For the July 2015 Final Rule, DOE identified the efficiency levels for the analysis based on the range of rated efficiencies of PTAC and PTHP equipment in the AHRI database. DOE selected PTAC and PTHP equipment that was representative of the market at different efficiency levels, then purchased, tested, and reverse engineered the selected equipment. DOE used the cost-assessment approach to determine the MPCs for PTAC and PTHP equipment across a range of efficiencies from the baseline to max-tech efficiency levels. 80 FR 43162, 43173 See chapter 5 of the July 2015 Final Rule TSD for additional detail.

Issue 17: DOE requests feedback on how manufacturers would incorporate the technology options listed in Table II.2 and Table II.3 of this RFI to increase energy efficiency in PTACs and PTHPs beyond the baseline. This includes information on the order in which manufacturers would incorporate the different technologies to incrementally improve the efficiencies of equipment.

Issue 18: DOE also seeks input on the increase in MPC associated with incorporating each particular design option. DOE also requests information on the investments necessary to incorporate specific design options, including, but not limited to, costs related to new or modified tooling (if any), materials, engineering and development efforts to implement each design option, and manufacturing/production impacts.

Issue 19: DOE requests comment on whether certain design options may not be applicable to (or may be incompatible with) specific equipment classes.

Issue 20: DOE requests information on how it could conduct the cost-efficiency analyses for PTHPs > 15,000 Btu/h, for which there are no models on the market and for which DOE does not have data.

To account for manufacturers' non-production costs and profit margin, DOE applies a non-production cost multiplier (the manufacturer markup) to the MPC. The resulting manufacturer selling price ("MSP") is the price at which the manufacturer distributes a unit into commerce. For the July 2015 Final Rule, DOE used a manufacturer markup of 1.27 for all PTACs and PTHPs. 80 FR 43162, 43177. See chapter 6 of the July 2015 Final Rule TSD for additional detail.

Issue 21: DOE requests feedback on whether manufacturer markup of 1.27 is appropriate for PTACs and PTHPs.

E. Distribution Channels

In this early assessment review RFI, DOE seeks information with respect to the distribution channels that could enable the department to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing. In generating end-user price inputs for the life-cycle cost (“LCC”) analysis and national impact analysis (“NIA”), DOE must identify distribution channels (*i.e.*, how the equipment are distributed from the manufacturer to the consumer), and estimate relative sales volumes through each channel. DOE identified four distribution channels for PTACs and PTHPs to describe how the equipment passes from the manufacturer to the consumer. 80 FR 43162, 43177-43178. The four distribution channels are listed below:

The first distribution channel is only used in the new construction market and it represents sales directly from a manufacturer to the end use customer through a national account.

Manufacturer → National Account → End user

The second distribution channel represents replacement markets, where a manufacturer sells to a wholesaler, who sells to a mechanical contractor, who in turn sells to the end user.

Manufacturer → Wholesaler → Mechanical Contractor → End user

The third distribution channel, which is used in both new construction and replacement markets, the manufacturer sells the equipment to a wholesaler, who in turn sells it to a mechanical contractor, who in turn sells its to a general contractor, who sells it to the end user.

**Manufacturer → Wholesaler → Mechanical Contractor → General Contractor
→ End user**

Finally, in the fourth distribution channel, which is also used in both the new construction and replacement markets, a manufacturer sells to a wholesaler, who in turn sells directly to the end user.

Manufacturer → Wholesaler → End User

Issue 22: DOE requests information on the existence of any distribution channels other than the four distribution channels identified in the July 2015 Final Rule that are used to distribute PTACs and PTHPs into the market. DOE also requests data on the fraction of PTAC and PTHP sales that go through each of the four identified distribution channels as well as the fraction of sales through any other identified channels.

F. Energy Use Analysis

In this early assessment review RFI, DOE seeks data and information with respect to energy use of PTACs and PTHPs that could enable the agency to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

As part of the rulemaking process, DOE conducts an energy use analysis to identify how equipment is used by consumers, and thereby determine the energy savings potential of energy efficiency improvements. In the July 2015 Final Rule, DOE developed estimates of the unit energy consumption (“UEC”) in kilowatt hours (“kWh”) by equipment type and EL. Energy savings from higher efficiency equipment was measured by comparing the UECs of higher ELs to the UEC of the ASHRAE baseline EL. 80 FR 43162, 43178-43179.

In the July 2015 Final Rule, DOE began with the UECs developed for PTACs and PTHPs in the October 2008 Final Rule. 73 FR 58772. DOE adjusted the base-year UEC to account for changes in climate between 2008 and 2013 using heating degree-days and cooling degree-days from a typical meteorological year (“TMY”) data set (referred to as TMY2) and an updated TMY3 data set. For each efficiency level that was previously analyzed in the October 2008 Final Rule, DOE used the TMY3-adjusted UEC value for that level. For efficiency levels that were not previously analyzed, DOE scaled the TMY3-adjusted cooling UECs based on interpolations between the EER values at different ELs and scaled the TMY3-adjusted heating UECs based on interpolations between the COP values at different ELs. 80 FR 43162, 43178-43179. Please refer to Chapter 7 of the July 2015 Final Rule TSD for more detail.

The UECs developed in the July 2015 Final Rule do not represent the energy use of make-up air units. DOE plans to use building loads from the small hotel commercial building prototypes and match those loads to performance data to properly account for the different operation of make-up air units and determine UECs to use for make-up air PTACs and PTHPs in the current energy use analysis.

Issue 23: DOE requests comment on the approach that was used to develop UECs in the energy use analysis for the July 2015 Final Rule, as well as any potential improvements in equipment that might impact UECs, or data indicating actual UECs for this equipment.

Issue 24: DOE requests comment on its approach to measure energy use of make-up air PTACs and PTHPs. Specifically, are these units used in any applications other than lodging? Also, are make-up air units primarily used in new construction or they also installed in replacement applications?

Issue 25: DOE requests performance data for make-up air PTACs and PTHPs.

G. Life-Cycle Cost and Payback Analysis

In this early assessment review RFI, DOE seeks data and information with respect to life-cycle cost and payback periods for PTACs and PTHPs that could enable the agency to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

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

1. Repair and Maintenance Costs

In order to develop annual operating costs and savings for the LCC analysis, DOE estimates repair and maintenance costs over the lifetime of the PTACs and PTHPs. In the July 2015 Final Rule, DOE used typical PTAC and PTHP warranties to estimate repair costs. DOE used a report on component failure rates and standard warranty terms prepared by EER

Consulting LLC along with RS Means⁹ for the labor and materials repair cost of different components. Most PTACs and PTHPs come with a one-year warranty covering all repairs and a 5-year limited warranty which covers repairs of the refrigeration system (non-refrigeration repairs would be paid by the owner in the second through fifth year of ownership). After the fifth year of ownership, the owner bears the full cost of a repair. DOE determined the expected value of the total cost of a repair and annualized it to determine the annual repair cost. DOE scaled the typical repair costs by cooling capacity and manufacturer selling price to determine the repair costs for the equipment classes and efficiency levels considered in the July 2015 Final Rule. 80 FR 43162, 43180. More information on the development of repair costs can be found in Chapter 8 of the July 2015 Final Rule TSD.

The maintenance costs used in the July 2015 Final Rule were taken from the October 2008 Final Rule, where the annual maintenance cost for PTACs was \$50. DOE adjusted this figure for inflation to arrive at an annual maintenance cost of \$55.56. The annualized costs for PTHPs were derived from the annualized maintenance costs for PTACs based on RS Means¹⁰ data for both PTACs and PTHPs. The percentage difference was applied to the PTAC maintenance costs to arrive at an annual maintenance cost of \$62.62 for PTHPs. More information on the development of maintenance costs can be found in Chapter 8 of the July 2015 Final Rule TSD.

Issue 26: DOE requests information and data on the frequency of repair and repair costs by equipment class for the technology options listed in Table II.2 and Table II.3 of this RFI. While DOE is interested in information regarding each of the listed technology options, DOE is also interested in whether, and at what point, consumers simply replace PTACs and PTHPs when

⁹ RS Means Company, Inc. "RS Means Facilities Maintenance and Repair Cost Data," 2013.

¹⁰ RS Means Company, Inc. RSMMeans Online, (Last accessed March 26, 2013.) <http://www.rsmeansonline.com>

they fail as opposed to repairing them.

Issue 27: DOE requests feedback and data on whether maintenance costs for any of the specific technology options listed in Table II.2 and Table II.3 of this RFI differ in comparison to the baseline maintenance costs. To the extent that these costs differ, DOE seeks supporting data and the reasons for those differences.

H. Shipments

In this early assessment review RFI, DOE seeks data and information with respect to PTACs and PTHPs shipments that could enable the agency to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

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

In the July 2015 Final Rule, DOE relied on historical shipments data provided by AHRI from 1998-2012. The shipments were distributed among the six standard size equipment classes that were analyzed in the prior rulemaking based on the average shares of each class from 1998-2004. 80 FR 43162, 43182. DOE assumed that this shipments breakdown by equipment class would stay constant throughout the analysis period. For more detail on the shipments analysis, please refer to Chapter 9 of the July 2015 Final Rule TSD.

Issue 28: DOE requests the most recent annual sales data (i.e., number of shipments) as well as historical annual sales data going back to 2015 for all equipment classes.

Issue 29: DOE requests the number of shipments by equipment class and efficiency level for the most recent year available. If disaggregated fractions of annual sales are not available at the equipment type class or efficiency level, DOE requests more aggregated fractions of annual sales at the category level.

Table II.7 shows the model counts by equipment class for PTACs and PTHPs along with the fraction of models by EER bin listed in the DOE CCMS database. In Issue 32, DOE requests that interested parties supplement this table with shipments data from 2015-2018. Interested parties are also encouraged to provide additional shipment data as may be relevant.

Table II.7 Count and Distribution of PTAC and PTHP Models by Equipment Class

Product Class	Cooling Capacity (Btu/h)	CCMS Model Count	Fraction of Models by EER Bin ¹						
			7.1 - 8 EER	8.1 - 9.0 EER	9.1 - 10.0 EER	10.1 - 11.0 EER	11.1 - 12.0 EER	12.1 - 13.0 EER	> 13.1 EER
Standard size PTAC	<7,000	56	N/A	N/A	N/A	N/A	64%	9%	27%
	7,000 to 15,000	1,363	N/A	N/A	11%	35%	34%	20%	1%
	>15,000	14	N/A	N/A	100%	0%	0%	0%	0%
Standard size PTHP	<7,000	76	N/A	N/A	N/A	N/A	64%	33%	3%
	7,000 to 15,000	1,009	N/A	N/A	8%	35%	36%	21%	0%
	>15,000	0	0%	0%	0%	0%	0%	0%	0%
Non-Standard size PTAC	<7,000	12	N/A	N/A	0%	0%	100%	0%	0%
	7,000 to 15,000	1,048	15%	37%	30%	10%	8%	0%	0%

	>15,000	23	48%	0%	52%	0%	0%	0%	0%
Non-Standard size PTHP	<7,000	12	N/A	N/A	0%	0%	100%	0%	0%
	7,000 to 15,000	884	19%	42%	36%	1%	1%	0%	0%
	>15,000	12	0%	0%	100%	0%	0%	0%	0%

¹ An N/A indicates that the EER bin is below the federal minimum for that equipment class.

Issue 30: If available, DOE requests shipment data covering the equipment classes and efficiency bins in Table II.7 of this RFI for each year going back to 2015.

Issue 31: DOE requests the number of shipments of make-up air PTACs and PTHPs in 2018 along with any future growth projections for make-up air units.

In the July 2015 Final Rule, DOE received comments that PTAC and PTHP lifetimes should be similar to the renovation cycles at hotels, which occur every 7 years on average. 80 FR 43162, 43180. DOE based equipment lifetime on a retirement function in the form of a Weibull probability distribution, with a mean of 7 years for lodging applications (70% of the market) and a mean of 10 years for all other applications. A Weibull distribution is a probability distribution function that is commonly used to measure failure rates. Its form is similar to an exponential distribution, which would model a fixed failure rate, except that it allows for a failure rate that changes over time. For more detail on the lifetime measurement, please refer to Chapter 8 of the July 2015 Final Rule TSD.

Issue 32: DOE requests comment on the average lifetime of 7 years for lodging applications and 10 years for all other applications. DOE also requests comment on the Weibull approach, along with any new data or information about the lifetimes of PTACs and PTHPs. DOE also requests input on whether equipment lifetimes vary by equipment class, by efficiency, or by end use.

I. Manufacturer Impact Analysis

In this early assessment review RFI, DOE seeks data and information with respect to manufacturer impacts that could enable the agency to determine whether to propose a “no new standard” determination because a more stringent standard: (1) would not result in a significant savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of foregoing.

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

As part of the MIA, DOE intends to analyze impacts of amended energy conservation standards on subgroups of manufacturers of covered equipment, including small business manufacturers. DOE uses the Small Business Administration’s (“SBA”) small business size standards to determine whether manufacturers qualify as small businesses, which are listed by the applicable North American Industry Classification System (“NAICS”) code.¹¹ Manufacturing of consumer PTACs and PTHPs is classified under NAICS 335415, “Air-

¹¹ Available online at <https://www.sba.gov/document/support--table-size-standards>.

Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing,” and the SBA sets a threshold of 1,250 employees or less for a domestic entity to be considered as a small business. This employee threshold includes all employees in a business’ parent company and any other subsidiaries.

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

Issue 33: To the extent feasible, DOE seeks the names and contact information of any domestic or foreign-based manufacturers that distribute PTACs and PTHPs in the United States.

Issue 34: DOE identified small businesses as a subgroup of manufacturers that could be disproportionately impacted by amended energy conservation standards. DOE requests the names and contact information of small business manufacturers, as defined by the SBA’s size threshold, of PTACs and PTHPs that distribute equipment in the United States. In addition, DOE requests comment on any other manufacturer subgroups that could be disproportionately impacted by

amended energy conservation standards. DOE requests feedback on any potential approaches that could be considered to address impacts on manufacturers, including small businesses.

Issue 35: DOE requests information regarding the cumulative regulatory burden impacts on manufacturers of PTACs and PTHPs associated with (1) other DOE standards applying to different equipment that these manufacturers may also make and (2) equipment-specific regulatory actions of other Federal agencies. DOE also requests comment on its methodology for computing cumulative regulatory burden and whether there are any flexibilities it can consider that would reduce this burden while remaining consistent with the requirements of EPCA.

J. Other Energy Conservation Standards Topics

1. Market Failures

In the field of economics, a market failure is a situation in which the market outcome does not maximize societal welfare. Such an outcome would result in unrealized potential welfare. DOE welcomes comment on any aspect of market failures, especially those in the context of amended energy conservation standards for PTACs and PTHPs.

2. Network Mode / “Smart” Technology

DOE published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018) (“2018 RFI”). In the 2018 RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE’s intent in issuing the 2018 RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. As part of this early assessment review, DOE seeks comments, data and information on the issues presented in

the 2018 RFI as they may be applicable to energy conservation standards for PTACs and PTHPs.

3. Other Issues

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

III. Submission of Comments

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

Submitting comments via <http://www.regulations.gov>. The <http://www.regulations.gov> web page requires you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies Office staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of

technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

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

Do not submit to <http://www.regulations.gov> information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (“CBI”)). Comments submitted through <http://www.regulations.gov> cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

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

Submitting comments via email, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to <http://www.regulations.gov>. If you do not want your personal contact information to be publicly

viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible, 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, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

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

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information

believed to be confidential deleted. Submit these documents via email to PTACHP2019STD0035@ee.doe.gov or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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

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

Signing Authority

This document of the Department of Energy was signed on December 8, 2020, by Daniel R Simmons, Assistant Secretary for the Office of Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register

Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on December 9, 2020

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

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