[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 430

[EERE-2017-BT-STD-0003]

Energy Conservation Program: Energy Conservation Standards for Consumer Refrigerators, Refrigerator-Freezers, and Freezers

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

ACTION: Request for information.

SUMMARY: The U.S. Department of Energy ("DOE") is initiating an effort to determine whether to amend the current energy conservation standards for consumer refrigerators, refrigerator-freezers, and freezers. Under the Energy Policy and Conservation Act of 1975, as amended, DOE must review these standards at least once every six years and publish either a notice of proposed rulemaking ("NOPR") to propose new standards for consumer refrigerators, refrigerator-freezers, and freezers or a notice of determination that the existing standards do not need to be amended. This request for information ("RFI") solicits information from the public to help DOE determine whether amended standards for consumer refrigerators, refrigerator-freezers, and freezers would result in a significant amount of additional energy savings and whether those standards would be technologically feasible and economically justified. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this RFI).

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

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *http://www.regulations.gov*. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2017-BT-STD-0003, by any of the following methods:

1. *Federal eRulemaking Portal*: *http://www.regulations.gov*. Follow the instructions for submitting comments.
2. *E-mail*: *ConsumerRefrigFreezer2017STD0003@ee.doe.gov*. Include the docket number EERE-2017-BT-STD-0003 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-2017-BT-TP-0003*. 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:

Dr. Stephanie Johnson, 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) 287-1943. E-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

Mr. Pete Cochran, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-9496. E-mail: *Peter.Cochran@hq.doe.gov*.

For further information on how to submit a comment, review other public comments and

the docket, contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by e-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

SUPPLEMENTARY INFORMATION:

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I. Introduction

A. Authority and Background

The Energy Policy and Conservation Act of 1975, as amended ("EPCA"),[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 B[2] of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles. These products include consumer refrigerators, refrigerator-freezers, and freezers, the subject of this document. (42 U.S.C. 6292(a)(1)) EPCA prescribed energy conservation standards for these products (42 U.S.C. 6295(b)(1)–(2)), and directed DOE to conduct three cycles of rulemakings to determine whether to amend these standards. (42 U.S.C. 6295(b)(3)(A)(i), (b)(3)(B)–(C), and (b)(4))

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

Federal energy efficiency requirements for covered products established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling,

[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 B was redesignated Part A.

and standards. (42 U.S.C. 6297(a)–(c)) 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 42 U.S.C. 6297(d).

DOE completed the first of these rulemaking cycles in 1989 and 1990 by adopting amended performance standards for consumer refrigerators, refrigerator-freezers, and freezers manufactured on or after January 1, 1993. 54 FR 47916 (Nov. 17, 1989) (setting amended standards to apply starting on January 1, 1993); 55 FR 42845 (Oct. 24, 1990) (making certain corrections to the 1993 standards). DOE completed a second rulemaking cycle to amend the standards for consumer refrigerators, refrigerator-freezers, and freezers by issuing a final rule in 1997. 62 FR 23102 (Apr. 28, 1997). Most recently, DOE completed a third rulemaking cycle to amend the standards for consumer refrigerators, refrigerator-freezers, and freezers by publishing a final rule in 2011 ("September 2011 Final Rule"). 76 FR 57516 (Sep. 15, 2011). The current energy conservation standards are located in title 10 of the Code of Federal Regulations ("CFR") part 430, section 32(a). The currently applicable DOE test procedures for consumer refrigerators, refrigerator-freezers, and freezers appear at 10 CFR part 430, subpart B, appendices A and B ("Appendix A" and "Appendix B").

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

6295(m)(1)) EPCA further provides that, not later than 3 years after the issuance of a final determination not to amend standards, DOE must publish either a notice of determination that standards for the product do not need to be amended, or a NOPR including new proposed energy conservation standards (proceeding to a final rule, as appropriate). (42 U.S.C. 6295(m)(3)(B)) DOE must make the analysis on which the determination is based publicly available and provide an opportunity for written comment. (42 U.S.C. 6295(m)(2)) In making a determination, DOE must evaluate whether more stringent standards would: (1) yield a significant savings in energy use and (2) be both technologically feasible and economically justified. (42 U.S.C. 6295(m)(1)(A))

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

B. Rulemaking Process

DOE must follow specific statutory criteria for prescribing new or amended standards for covered products. EPCA requires that any new or amended energy conservation standard be designed to achieve the maximum improvement in energy or water efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A)) EPCA also precludes DOE from adopting any standard that would not result in the significant conservation of energy. (42 U.S.C. 6295(o)(3)(B)) To determine whether a standard is economically justified, EPCA requires that DOE determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

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

affected products;

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

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

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

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

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

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

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

Table I.1 EPCA Requirements and Corresponding DOE Analysis

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

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

II. Request for Information and Comments

The following sections identify a variety of issues on which DOE seeks input to aid its development of the technical and economic analyses regarding whether amended energy conservation standards for consumer refrigerators, refrigerator-freezers, and freezers may be warranted. DOE also welcomes comments on other issues relevant to this data-gathering process that may not specifically be identified in this document.

A. Products Covered by This Rulemaking

This RFI covers those products that meet the definitions for refrigerator, refrigerator-freezer, or freezer, as codified in 10 CFR 430.2. The definitions for refrigerators, refrigerator-freezers, and freezers were most recently amended in a test procedure final rule in a separate rulemaking addressing "miscellaneous refrigeration products"[3] (MREFs), in which DOE removed reference to food storage, clarified under what conditions the products must be able to maintain compartment temperatures, and excluded products designed to be used without doors, that do not include a compressor and condenser integral to the cabinet assembly, or that would be classified as an MREF. 81 FR 46768 (July 18, 2016).

Specifically, as codified, "refrigerator" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy

[3] "Miscellaneous refrigeration product" means a consumer refrigeration product other than a refrigerator, refrigerator-freezer, or freezer, which includes coolers and combination cooler refrigeration products. 10 CFR 430.2. "Cooler" means a cabinet, used with one or more doors, that has a source of refrigeration capable of operating on single-phase, alternating current and is capable of maintaining compartment temperatures either no lower than 39 °F (3.9 °C) or in a range that extends no lower than 37 °F (2.8 °C) but at least as high as 60 °F (15.6 °C). *Id.* "Combination cooler refrigeration product" means any cooler-refrigerator, cooler-refrigerator-freezer, or cooler-freezer. *Id.*

input only and is capable of maintaining compartment temperatures above 32 degrees Fahrenheit (°F) (0 degrees Celsius (°C)) and below 39 °F (3.9 °C). A refrigerator may include a compartment capable of maintaining compartment temperatures below 32 °F (0 °C), but does not provide a separate low temperature compartment capable of maintaining compartment temperatures below 8 °F (−13.3 °C). A refrigerator does not include: any product that does not include a compressor and condenser unit as an integral part of the cabinet assembly, coolers, or any product that must comply with an applicable miscellaneous refrigeration product energy conservation standard. 10 CFR 430.2.

"Refrigerator-freezer" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only and consists of two or more compartments where at least one of the compartments is capable of maintaining compartment temperatures above 32 °F (0 °C) and below 39 °F (3.9 °C), and at least one other compartment is capable of maintaining compartment temperatures of 8 °F (−13.3 °C) and may be adjusted by the user to a temperature of 0 °F (−17.8 °C) or below. A refrigerator-freezer does not include: any product that does not include a compressor and condenser unit as an integral part of the cabinet assembly, or any product that must comply with an applicable miscellaneous refrigeration product energy conservation standard. *Id*.

"Freezer" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only and is capable of maintaining compartment temperatures of 0 °F (−17.8 °C) or below. A freezer does not include: any refrigerated cabinet that consists solely of an automatic ice maker and an ice storage bin

arranged so that operation of the automatic icemaker fills the bin to its capacity, any product that does not include a compressor and condenser unit as an integral part of the cabinet assembly, or any product that must comply with an applicable miscellaneous refrigeration product energy conservation standard. *Id*.

DOE's regulations at 10 CFR 430.2 also define sub-categories of refrigerators, refrigerator-freezers, and freezers, including compact[4] and built-in[5] product configurations.

Issue A.1 DOE requests comment on whether the definitions for refrigerator, refrigerator-freezer, and freezer require any revisions – and if so, how those definitions should be revised. DOE also requests feedback on whether the sub-category definitions currently in place 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.

Issue A.2 DOE requests comment on whether additional product definitions are necessary to close any potential gaps in coverage between product types. For example, should the definitions be modified to better account for products that maintain compartment temperatures above 0 °F or 8 °F but less than 32 °F (*i.e.*, between the freezer and refrigerator temperature ranges). DOE also seeks input on whether such products currently exist in the market or whether

[4] *Compact refrigerator/refrigerator-freezer/freezer* means any refrigerator, refrigerator-freezer or freezer with a total refrigerated volume of less than 7.75 cubic feet (220 liters). (Total refrigerated volume shall be determined using the applicable test procedure appendix prescribed in 10 CFR part 430 subpart B.) *Id.*

[5] *Built-in refrigerator/refrigerator-freezer/freezer* means any refrigerator, refrigerator-freezer or freezer with 7.75 cubic feet or greater total volume and 24 inches or less depth not including doors, handles, and custom front panels; with sides which are not finished and not designed to be visible after installation; and that is designed, intended, and marketed exclusively (1) To be installed totally encased by cabinetry or panels that are attached during installation, (2) to be securely fastened to adjacent cabinetry, walls or floor, and (3) to either be equipped with an integral factory-finished face or accept a custom front panel. *Id.*

they are being planned for introduction. DOE also requests comment on opportunities to combine product 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 consumer refrigerator, refrigerator-freezer, and freezer industries that will be used in DOE's analysis throughout the rulemaking process. DOE uses qualitative and quantitative information to characterize the structure of the industry and market. DOE identifies manufacturers, estimates market shares and trends, addresses regulatory and non-regulatory initiatives intended to improve energy efficiency or reduce energy consumption, and explores the potential for efficiency improvements in the design and manufacturing of consumer refrigerators, refrigerator-freezers, and freezers. 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 consumer refrigerators, refrigerator-freezers, and freezers.

1. Product/Equipment Classes

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

For consumer refrigerators, refrigerator-freezers, and freezers, the current energy conservation standards specified in 10 CFR 430.32(a) are based on 42 product classes determined according to the following performance-related features that provide utility to the consumer, in terms of the type and quantity of items that may be stored, method of access to these items, availability of automatically made ice, defrost requirements, and locations where the product may be installed: type of unit (refrigerator, refrigerator-freezer, or freezer), total refrigerated volume (standard or compact), defrost system (manual, partial automatic, or automatic), presence of through-the-door ("TTD") ice service, presence of an automatic icemaker, intended installation (*i.e.*, built-in or freestanding), and configuration of compartments and doors. Table II.1 lists the current 42 product classes for consumer refrigerators, refrigerator-freezers, and freezers.

Table II.1 Current Consumer Refrigerator, Refrigerator-Freezer, and Freezer Product Classes

Product Class	
1	Refrigerator-freezers and refrigerators other than all-refrigerators with manual defrost
1A	All-refrigerators—manual defrost
2	Refrigerator-freezers—partial automatic defrost
3	Refrigerator-freezers—automatic defrost with top-mounted freezer without an automatic icemaker
3-BI	Built-in refrigerator-freezer—automatic defrost with top-mounted freezer without an automatic icemaker
3I	Refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker without through-the-door ice service
3I-BI	Built-in refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker without through-the-door ice service
3A	All-refrigerators—automatic defrost
3A-BI	Built-in all-refrigerators—automatic defrost
4	Refrigerator-freezers—automatic defrost with side-mounted freezer without an automatic icemaker
4-BI	Built-in refrigerator-freezers—automatic defrost with side-mounted freezer without an automatic icemaker

Product Class	
4I	Refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker without through-the-door ice service
4I-BI	Built-in refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker without through-the-door ice service
5	Refrigerator-freezers—automatic defrost with bottom-mounted freezer without an automatic icemaker
5-BI	Built-in refrigerator-freezers—automatic defrost with bottom-mounted freezer without an automatic icemaker
5I	Refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker without through-the-door ice service
5I-BI	Built-in refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker without through-the-door ice service
5A	Refrigerator-freezer—automatic defrost with bottom-mounted freezer with through-the-door ice service
5A-BI	Built-in refrigerator-freezer—automatic defrost with bottom-mounted freezer with through-the-door ice service
6	Refrigerator-freezers—automatic defrost with top-mounted freezer with through-the-door ice service
7	Refrigerator-freezers—automatic defrost with side-mounted freezer with through-the-door ice service
7-BI	Built-in refrigerator-freezers—automatic defrost with side-mounted freezer with through-the-door ice service
8	Upright freezers with manual defrost
9	Upright freezers with automatic defrost without an automatic icemaker
9I	Upright freezers with automatic defrost with an automatic icemaker
9-BI	Built-in upright freezers with automatic defrost without an automatic icemaker
9I-BI	Built-in upright freezers with automatic defrost with an automatic icemaker
10	Chest freezers and all other freezers except compact freezers
10A	Chest freezers with automatic defrost
11	Compact refrigerator-freezers and refrigerators other than all-refrigerators with manual defrost
11A	Compact all-refrigerators—manual defrost
12	Compact refrigerator-freezers—partial automatic defrost
13	Compact refrigerator-freezers—automatic defrost with top-mounted freezer
13I	Compact refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker
13A	Compact all-refrigerators—automatic defrost
14	Compact refrigerator-freezers—automatic defrost with side-mounted freezer
14I	Compact refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker
15	Compact refrigerator-freezers—automatic defrost with bottom-mounted freezer
15I	Compact refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker
16	Compact upright freezers with manual defrost

Product Class	
17	Compact upright freezers with automatic defrost
18	Compact chest freezers

For products with an automatic icemaker, DOE's test procedures specify a constant energy-use adder of 84 kilowatt-hours per year ("kWh/year"), which represents the annual energy consumed by automatic icemakers in consumer refrigerators, refrigerator-freezers, and freezers. With this constant adder, the standard levels for product classes with an automatic icemaker are equal to the standards of their counterparts without an icemaker plus the 84 kWh/year. Because the standards for the product classes with and without automatic icemakers are effectively the same, except for the constant adder, there may be an opportunity to merge product classes to limit the total number of overall product classes for consumer refrigerators, refrigerator-freezers, and freezers. The energy consumption associated with automatic icemaking could then be incorporated into product labeling rather than the energy conservation standard.

In the most recent energy conservation standards rulemaking for consumer refrigerators, refrigerator-freezers, and freezers, DOE considered combining certain product classes that include products with similar features and operation. Specifically, DOE sought feedback on combining product classes 1 and 2, and product classes 11 and 12. 75 FR 59470, 59493-59494 (Sep. 27, 2010). DOE received mixed feedback on this issue, with comments responding to the NOPR for that rulemaking generally favoring the continued separation of these product classes. As a result, DOE did not merge these product classes in the 2011 Final Rule. 76 FR 57516, 57536 (Sept. 15, 2011).

Issue B.1 DOE requests feedback on the current consumer refrigerator, refrigerator-freezer, and freezer product classes and whether changes to these individual product classes and their descriptions should be made or whether certain classes should be merged or separated (*e.g.*, combining separate product classes equipped with and without automatic icemakers or combining certain classes, such as product classes 1 and 2, or product classes 11 and 12). DOE further requests feedback on whether combining certain classes could impact product utility by eliminating any performance-related features or impact the stringency of the current energy conservation standard for these products. DOE also requests comment on separating any of the existing product classes and whether it would impact product utility by eliminating any performance-related features or reduce any compliance burdens.

DOE is also aware that new configurations and features are available for consumer refrigerators, refrigerator-freezers, and freezers that may not have been available at the time of the last energy conservation standards analysis. Products with multiple compartments, some of which may be intended for storing certain types of food or beverages rather than general fresh food and freezer compartments, may have different energy performance compared to typical product setups. Additionally, product features such as accessible door storage and connected functions may affect product performance compared to those without such features.

Issue B.2 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 (*e.g.*, connected functionality, door-in-door designs, display screens, *etc.*) that provide unique consumer utility and data detailing the corresponding impacts

on energy use that would justify separate product classes (*i.e.*, explanation for why the presence of these performance-related features would increase energy consumption).

2. Technology Assessment

In analyzing the feasibility of potential new or amended energy conservation standards, DOE uses information about existing and past technology options and prototype designs to help identify technologies that manufacturers could use to meet and/or exceed a given set of energy conservation standards under consideration. In consultation with interested parties, DOE intends to develop a list of technologies to consider in its analysis. That analysis will likely include a number of the technology options DOE previously considered during its most recent rulemaking for consumer refrigerators, refrigerator-freezers, and freezers. A complete list of those prior options appears in Table II.2. As certain technologies have progressed since the 2011 Final Rule, Table II.3 lists newer technology options that DOE may also consider in a future consumer refrigerator, refrigerator-freezer, and freezer rulemaking.

Table II.2 Previously Considered Technology Options for Consumer Refrigerators, Refrigerator-Freezers, and Freezers from the 2011 Final Rule

Insulation	**Fans and Fan Motor**
Improved resistivity of insulation	Evaporator fan and fan motor improvements
Increased insulation thickness	Condenser fan and fan motor improvements
Vacuum-insulated panels (VIPs)	**Expansion Valve**
Gas-filled panels	Improved expansion valves
Gasket and Door Design	**Cycling Losses**
Improved gaskets	Fluid control or solenoid valve
Double door gaskets	**Defrost System**
Improved door face frame	Reduced energy for automatic defrost
Reduced heat load for TTD feature	Adaptive defrost
Anti-Sweat Heater	Condenser hot gas

Condenser hot gas	**Control System**
Electric heater sizing	Temperature control
Electric heater controls	Air-distribution control
Compressor	**Other Technologies**
Improved compressor efficiency	Alternative refrigerants
Variable-speed compressors	Component location
Linear compressors	**Alternative Refrigeration Cycles/Systems**
Evaporator	Lorenz-Meutzner cycle
Increased surface area	Dual-loop system
Improved heat exchange	Two-stage system
Condenser	Control valve system
Increased surface area	Ejector refrigerator
Improved heat exchange	Tandem system
Forced-convection condenser	Stirling cycle*
	Thermoelectric*
	Thermoacoustic*

* DOE's definitions for refrigerators, refrigerator-freezers, and freezers exclude products that do not include compressor and condenser units as an integral part of the cabinet assembly. 10 CFR 430.2. Therefore, because these options do not meet this requirement, DOE is not seeking information on these refrigeration technologies as part of this RFI.

Table II.3 New Technology Options for Consumer Refrigerators, Refrigerator-Freezers, and Freezers

Insulation	**Evaporator**
Improved VIPs	Sequential dual evaporator
Improved blowing agents	**Condenser**
Compressor	Heat-storage condenser with phase change materials
Large compressors with phase change material	Condensers with microchannel heat exchangers
Solid state thermal cooling technology	**Other Technologies**
Inert blowing fluid CO_2	Alternative refrigerants – *e.g.*, propane, isobutane
	Door-in-door design

Issue B.3 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 consumer refrigerators, refrigerator-freezers, and freezers as measured according to the DOE test procedure. DOE also seeks information on how these technologies may have changed since they were considered in the 2011 Final Rule analysis. Specifically, DOE seeks information on the range of efficiencies or performance characteristics that are currently available for each technology option.

Issue B.4 DOE seeks information on the technologies listed in Table II.3 regarding their market adoption, costs, and any concerns with incorporating them into products (*e.g.*, impacts on consumer utility, potential safety concerns, manufacturing/production/implementation issues, *etc.*).

Issue B.5 DOE seeks information on the availability of improved insulation for consumer refrigerators, refrigerator-freezers, and freezers, specifically on the use of polyurethane ("PU") foam and VIPs. At the time of the 2011 Final Rule, vendors indicated that there was ongoing work with PU foam insulation that may lead to improvements in insulation performance. DOE seeks any information on the current and projected future status of improved PU foam insulation as a viable design option for the products at issue, and whether improved PU foam insulation has entered the market. During the 2011 Final Rule analysis, DOE noted that manufacturers had varying levels of success implementing VIPs into their products. DOE also seeks information on what advances, if any, the insulation and consumer refrigerator, refrigerator-freezer, and freezer industries have made with respect to the incorporation of VIP technologies.

Issue B.6 DOE seeks comment on other technology options that it should consider for inclusion in its analysis and if these technologies may impact product features or consumer utility.

In October 2016, the 28th Meeting of the Parties to the Montreal Protocol adopted the Kigali Amendment to reduce consumption and production of hydrofluorocarbons ("HFCs"). The Kigali Amendment entered into force on January 1, 2019, for those parties who have ratified the Amendment by that time.[6] On December 1, 2016, the Environmental Protection Agency ("EPA") published a final rule in the *Federal Register* under its Significant New Alternatives Policy ("SNAP") program that, amongst other things, changed the status from acceptable to unacceptable of certain HFC-based refrigerants (*e.g.*, R-134a) commonly used in consumer refrigerators, refrigerator-freezers, and freezers as of January 1, 2021. 81 FR 86778. The validity of that approach, however, has been the subject of a legal challenge regarding EPA's use of its SNAP authority to require manufacturers to replace HFCs with a substitute substance and the December 2016 SNAP rule was partially vacated by the court.[7] On August 8, 2018, the EPA published a separate final rule under its SNAP program that modified the use conditions for three flammable refrigerants used in household refrigerators, freezers, and combination refrigerators and freezers. 83 FR 38969. This rule, among other modifications, increased the allowable charge limits for propane and isobutane when used in consumer refrigeration products.

[6] *https://ozone.unep.org/sites/default/files/2019-07/MP_Handbook_2019.pdf*.

[7] In August 2017, the U.S. Court of Appeals for the District of Columbia Circuit vacated and remanded a July 2015 EPA final rule (80 FR 42870 (July 20, 2015)) to the extent that it required manufacturers to replace HFCs with a substitute substance. *See Mexichem Fluor, Inc. v. EPA*, 866 F.3d 451 (D.C. Cir. 2017); *cert. denied* 139 S.Ct. 322 (Oct. 9, 2018). Subsequent to the decision in the *Mexichem* case, the court vacated the December 2016 EPA final rule to the extent it requires manufacturers to replace HFCs that were previously and lawfully installed as substitutes for ozone-depleting substances. Case No. 17-1024 (D.C. Cir. April 5, 2019). DOE will consider the potential impact, if any, of the court's decisions and remand on the products addressed by this RFI.

DOE understands that, while the United States has not yet ratified the Kigali Amendment, a significant portion of refrigerators, refrigerator-freezers, and freezers currently use HFC-based refrigerants and may become affected by this Amendment to the Montreal Protocol. DOE plans to account for the impacts, if any, from this Amendment and the SNAP regulations on the consumer refrigerator, refrigerator-freezer, and freezer markets addressed by this RFI in each of the analytical cases that DOE routinely examines, including the no-new-standards analytical case (*i.e.*, without an amended energy conservation standard).

Issue B.7 DOE seeks information related to alternative HFC-free refrigerants, including propane and isobutane. Specifically, DOE seeks information on the availability of such refrigerants and their applicability and/or penetration in the current market (including whether charge limits or safety standards (for example, Underwriter's Laboratory's ("UL") Standard 60335–2–24, "Safety Requirements for Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers" (2nd Edition, April 28, 2017)) would restrict their use). DOE also requests information on which alternative refrigerant is the most appropriate substitute for R-134a and why.

Issue B.8 DOE requests information and data on the fractional change in efficiency and cost associated with converting an HFC-based refrigerator, refrigerator-freezer, or freezer to an HFC-free refrigerator, refrigerator-freezer, or freezer (both per-unit costs and conversion costs). DOE also seeks feedback on whether the conversion to HFC-free refrigeration systems would affect the availability of any product features (*e.g.*, volumes, configurations, *etc.*) Additionally, if the use of HFC refrigerants were to remain an available option to manufacturers, would this

factor impact the efficiency and related costs of these products relative to products that rely on HFC-free refrigerants? If so, how? What would the extent of these efficiency and cost impacts be?

Issue B.9 DOE also requests data on the current and historical (past five years) fraction of HFC-free sales by product type (*e.g.*, top-mount, side-mount, and bottom-mount refrigerator-freezers, or upright and chest freezers).

C. Screening Analysis

The purpose of the screening analysis is to evaluate the technologies that improve equipment efficiency to determine which technologies will be eliminated from further consideration and which will be passed to the engineering analysis for further consideration.

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

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

(2) Practicability to manufacture, install, and service. If it is determined that mass production of a technology in commercial products and reliable installation and servicing of the technology could not be achieved on the scale necessary to serve the relevant market at the time of the effective 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.[8]

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

10 CFR part 430, subpart C, appendix A, 4(a)(4) and 5(b).

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

Table II.4 summarizes the screened out technology options, and the applicable screening

[8] For example, in the previous rulemaking for refrigerators, refrigerator-freezers, and freezers, DOE did not consider cabinet wall thickness increases for some product classes due to the associated utility impact. See Chapter 4 of the technical support document for the 2011 Final Rule.

criteria, from the 2011 Final Rule.

Table II.4 Previously Screened Out Technology Options from the 2011 Final Rule

	EPCA Criteria (X = Basis for Screening Out)			
Screened Technology Option	**Technological Feasibility**	**Practicability to Manufacture, Install, and Service**	**Adverse Impact on Product Utility**	**Adverse Impacts on Health and Safety**
Improved PU Insulation Resistivity	X			
Gas-Filled Panels	X	X		
Improved Gaskets, Double Gaskets, Improved Door Frame		X	X	
Linear Compressors	X			
Improved Heat Exchange	X		X	
Component Location		X	X	X
Lorenz-Meutzner Cycle	X	X		
Two-Stage System	X	X		
Control Valve System and Tandem System	X	X		
Ejector Refrigerator	X	X		
Stirling Cycle*	X	X		
Thermoelectric*	X	X		
Thermoacoustic*	X	X		

* As stated in the note to Table II.2, DOE's definitions for refrigerator, refrigerator-freezer, and freezer exclude products without compressor and condenser units as an integral part of the cabinet assembly, so DOE would not consider these technology options in a future energy conservation standards rulemaking.

Issue C.1 DOE requests feedback on what impact, if any, the four screening criteria described in this section would have on each of the technology options listed in Table II.2 and Table II.3 with respect to consumer refrigerators, refrigerator-freezers, and freezers. Similarly,

DOE seeks information regarding how these same criteria would affect any other technology options not already identified in this document with respect to their potential use in refrigerators, refrigerator-freezers, and freezers.

Issue C.2 With respect to the screened out technology options listed in Table II.4, 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 consumer refrigerators, refrigerator-freezers, and freezers and the potential to impact consumer utility of the refrigerators, refrigerator-freezers, and freezers.

D. Engineering Analysis

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

DOE historically has used the following three methodologies to generate incremental manufacturing costs and establish efficiency levels ("ELs") for analysis: (1) the design-option

approach, which provides the incremental costs of adding to a baseline model 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 data as to costs for parts and material, labor, shipping/packaging, and investment for models that operate at particular efficiency levels.

1. Baseline Efficiency Levels

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

If it determines that a rulemaking is necessary, consistent with this analytical approach, DOE tentatively plans to consider the current minimum energy conservations standards (which went into effect September 15, 2014) to establish the baseline efficiency levels for each product class. The current standards for each product class are based on the maximum allowable annual energy use in kWh/year and determined according to an equation using the product's calculated adjusted volume ("AV") in cubic feet ("ft^3"). The current standards for consumer refrigerators, refrigerator-freezers, and freezers are found in 10 CFR 430.32(a).

Issue D.1 DOE requests feedback on whether using the current established energy conservation standards for consumer refrigerators, refrigerator-freezers, and freezers are appropriate baseline efficiency levels for DOE to apply to each product class in evaluating whether to amend the current energy conservation standards for these products. DOE requests data and suggestions to evaluate the baseline efficiency levels in order to better evaluate amending energy conservation standards for these products.

Issue D.2 DOE requests feedback on the appropriate baseline efficiency levels for any newly analyzed product classes that are not currently in place or for the contemplated combined product classes, as discussed in section II.B.1 of this document. For newly analyzed product classes, DOE requests energy use data to develop a baseline relationship between energy use and adjusted volume.

2. Maximum Available and Maximum Technology Levels

As part of DOE's analysis, the maximum available efficiency level is the highest efficiency unit currently available on the market. For the 2011 Final Rule, DOE did not analyze all 42 consumer refrigerator, refrigerator-freezer, and freezer product classes. Rather, DOE focused on 11 product classes. Seven of the 11 analyzed product classes represented over 90 percent of product shipments in the market at the time of the analysis. *See* 76 FR 57516, 57530 and chapter 2 of the preliminary analysis technical support document ("TSD") for that

rulemaking. The current maximum available efficiencies for these 11 analyzed product classes are included in Table II.5.

Table II.5 Maximum Efficiency Levels Currently Available

Product Class	Rated Energy Use Percentage Below Maximum Allowable Limit	Adjusted Volume (ft^3)
3	14%	17
5	32%	13
7	28%	32
9	25%	24
10	17%	18
11	22%	3
18	26%	12
3A-BI	37%	12
5-BI	17%	11
7-BI	9%	32, 33, 37
9I-BI	25%	28

Source: DOE Compliance Certification Database (as of April 9, 2019)

DOE defines a max-tech efficiency level to represent the theoretical maximum possible efficiency if all available design options are incorporated in a product. In many cases, the max-tech efficiency level is not commercially available because it is not economically feasible. In the 2011 Final Rule, DOE determined max-tech efficiency levels using energy modeling. These energy models were based on use of all design options applicable to the specific product classes. While these product configurations had not likely been tested as prototypes, all of the individual design options had been incorporated in available products.

Issue D.3 DOE seeks input and data that would allow it to evaluate the appropriateness and technological feasibility of the maximum available efficiency levels for potential consideration as possible energy conservation standards for the products at issue. DOE also

requests feedback on whether the maximum available efficiencies presented in Table II.5 are representative of those for the other consumer refrigerator, refrigerator-freezer, and freezer product classes not directly analyzed in the 2011 Final Rule. If the range of possible efficiencies is different for the other product classes not directly analyzed, DOE requests alternative approaches that should be considered for those product classes and data and information to support use of the alternative.

Issue D.4 DOE seeks feedback on what design options would be incorporated at a max-tech efficiency level, and the efficiencies associated with those levels. As part of this request, DOE also seeks information as to whether there are limitations on the use of certain combinations of design options.

3. Manufacturer Production Costs and Manufacturing Selling Price

As described at the beginning of this section, the main outputs of the engineering analysis are cost-efficiency relationships that describe the estimated increases in manufacturer production cost associated with higher-efficiency products for the analyzed product classes. For the 2011 Final Rule, DOE developed the cost-efficiency relationships by estimating the efficiency improvements and costs associated with incorporating specific design options into the assumed baseline model for each analyzed product class.

Issue D.5 DOE requests feedback on how manufacturers would incorporate the technology options listed in Table II.2 and Table II.3 to increase energy efficiency in consumer refrigerators, refrigerator-freezers, and freezers beyond the baseline. This includes information

on the order in which manufacturers would incorporate the different technologies to incrementally improve the efficiencies of products. DOE also requests feedback on whether the increased energy efficiency would lead to other design changes that would not occur otherwise. DOE is also interested in information regarding any potential impact of design options on a manufacturer's ability to incorporate additional functions or attributes in response to consumer demand.

Issue D.6 DOE also seeks input on the increase in MPC associated with incorporating each particular design option. Specifically, DOE is interested in whether and how the costs estimated for design options in the 2011 Final Rule have changed since the time of that analysis. DOE also requests information on the investments necessary to incorporate specific design options, including, but not limited to, costs related to new or modified tooling (if any), materials, engineering and development efforts to implement each design option, and manufacturing/production impacts.

Issue D.7 DOE requests comment on whether certain design options may not be applicable to (or are incompatible with) specific product classes.

As described in section II.D.2 of this document, DOE analyzed 11 product classes in the 2011 Final Rule. DOE developed cost-efficiency curves for each of these product classes that were used as the input for the downstream analyses conducted in support of that rulemaking. See chapter 5 of the 2011 Final Rule TSD for the cost-efficiency curves developed in that rulemaking.

Issue D.8 DOE seeks feedback on whether the approach of analyzing a sub-set of product classes is appropriate for a future consumer refrigerator, refrigerator-freezer, and freezer energy conservation standards rulemaking. DOE requests comment on whether it is necessary to individually analyze all 11 product classes used in the 2011 Final Rule. For example, analysis on the built-in product classes may not be necessary if the analysis on the corresponding freestanding product classes is applicable to both product classes. Additionally, DOE requests data and suggestions to evaluate the approach used to apply the analyzed product class results to other product classes. For example, if it is necessary to individually analyze more than 11 product classes used in the 2011 Final Rule, DOE requests information on why aggregating certain products is not appropriate. If this approach is not appropriate, DOE requests alternative approaches and data and information that would support the use of the alternative.[9]

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 2011 Final Rule, DOE used a manufacturer markup of 1.26 for all non-built-in products and a manufacturer markup of 1.40 for built-in products. See chapter 6 of the 2011 Final Rule TSD.

Issue D.9 DOE requests feedback on whether manufacturer markups of 1.26 and 1.40 are appropriate for non-built-in and built-in products, respectively.

[9] See chapter 2, section 2.15 in the preliminary analysis TSD published during the rulemaking process leading to the 2011 Final Rule, document #22 on regulations.gov in docket ID EERE-2008-BT-STD-0012.

E. Distribution Channels

In generating end-user price inputs for the life-cycle cost ("LCC") analysis and national impact analysis ("NIA"), DOE must identify distribution channels (*i.e.*, how the products are distributed from the manufacturer to the consumer), and estimate relative sales volumes through each channel. In the 2011 Final Rule, DOE only accounted for the retail outlets distribution channel because data from the Association of Home Appliance Manufacturers ("AHAM") 2005 *Fact Book* indicates that the overwhelming majority of residential appliances were sold through retail outlets. In that rulemaking, DOE did not include a separate distribution channel for refrigeration products included as part of a new home because DOE did not have enough information to characterize which of these products were "pre-installed" by builders in these new homes. Should sufficient information become available, DOE may consider including a separate distribution channel that includes a contractor in addition to the existing retail outlets distribution channel.

Issue E.1 DOE requests information on the existence of any distribution channels other than the retail outlet distribution channel that are used to distribute the products at issue into the market. DOE also requests data on the fraction of full-size consumer refrigerator and refrigerator-freezer sales in the residential sector that go through both a wholesaler/retailer and a contractor as well as the fraction of sales that go through any other identified channels.

F. Energy Use Analysis

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

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

1. Usage Adjustment Factor

In the 2011 Final Rule, DOE incorporated a usage adjustment factor ("UAF"), which served to correct for differences in a product's actual energy use in the field and the product's energy use as determined by the DOE test procedure. Average UAFs were calculated for each product class, and most product classes incorporated an age-dependent UAF, and a distribution of UAFs dependent on the average outdoor temperature, as well as the number of occupants across the household sample in the LCC; additionally, separate UAFs were calculated for primary and secondary refrigerators. Since the publication of the 2011 Final Rule, DOE amended its test procedure for these products. 79 FR 22320 (April 21, 2014).

Issue F.1 DOE requests feedback and data on whether a product's energy use results from the current test procedure accurately reflect the product's average energy use in the field, thereby rendering an average UAF unnecessary for this rulemaking. If the UAF is still necessary, DOE requests data and information to allow it to better evaluate the representativeness of the current UAF. DOE also requests suggestions and data that would allow DOE to evaluate steps that could be taken to bring these two values into closer harmony.

Issue F.2 DOE also requests feedback and data on how a product's energy use changes

with age, how the number of occupants in the household affects the product's energy use, and whether separate UAFs for primary and secondary refrigerator-freezers are necessary.

2. Connected Refrigerators, Refrigerator-Freezers, and Freezers

DOE is aware of the introduction of internet-connected refrigerators and refrigerator-freezers on the market. DOE recently published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018). In that RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE's intent in issuing the RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. Additionally, as discussed in the RFI, DOE lacks data regarding consumer use of connected features.

Issue F.3 DOE requests information and data specific to consumer use and the associated power consumption of connected features on internet-connected refrigerators, refrigerator-freezers, and freezers.

G. Repair and Maintenance Costs

In the 2011 Final Rule, DOE estimated the increase in repair costs from using specific technology found in some higher efficiency design options; however, DOE excluded maintenance costs from its analysis because there was no evidence that maintenance costs change by efficiency level. In the 2011 Final Rule analysis, DOE used relative component repair rates from a prior rulemaking for commercial refrigeration equipment combined with aggregate

survey data from Consumers Union collected in 2009 to estimate the repair rate by product class and efficiency level. To estimate the repair costs, DOE used incremental cost models developed in the engineering analysis in addition to baseline repair cost data from Best Buy Co., Inc.

Issue G.1 DOE requests feedback and data on whether maintenance costs differ in comparison to the baseline maintenance costs for any of the specific technology options listed in Table II.2 and Table II.3. To the extent that these costs differ, DOE seeks supporting data and the reasons for those differences.

Issue G.2 DOE requests information and data on the frequency of repair and repair costs by product class for the technology options listed in Table II.2 and Table II.3. While DOE is interested in information regarding each of the listed technology options, DOE is particularly interested in the impacts on repair frequencies and costs with respect to those products that use VIPs and variable-speed compressors. DOE is also interested in whether consumers simply replace the products when they fail as opposed to repairing them.

H. Shipments

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

Issue H.1 DOE requests 2018 annual sales data (*i.e.*, number of shipments) for refrigerators with a top-mounted freezer, TTD refrigerators with a bottom-mounted freezer, non-TTD refrigerators with a bottom-mounted freezer, refrigerators with a side-mounted freezer, compact refrigerators, chest freezers, and upright freezers. For each category, DOE also requests the fraction of sales that are ENERGY STAR-qualified.

Issue H.2 DOE requests 2018 data on the fraction of sales in the residential and commercial sector for full-size refrigerators, compact refrigerators, and freezers.

Issue H.3 DOE requests 2018 data on the fraction of sales of full-size refrigerators, compact refrigerators, and upright freezers that are built-in models.

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

Issue H.4 If available, DOE requests the same information for the previous five years (2013-2017).

Issue H.5 DOE requests available 2018 sales data on the fraction of full-size refrigerator sales by technology for the technology options listed in Table II.2 and Table II.3, and in particular, for VIPs and variable-speed compressors. DOE also requests information on any expected market trends in the popularity of those technology options.

Issue H.6 DOE requests data and information on any trends in the refrigeration market that could be used to forecast expected trends in product class market share, as well as market share of efficiency levels within each product class. DOE also requests data and information on the existence of price learning for refrigeration products, which could impact market shares over the analysis period.

Issue H.7 DOE has identified several new features, such as door-in-door configuration and "smart" internet-connected refrigerators, which may impact total energy consumption. DOE requests input on any expected market trends for such features.

Issue H.8 An initial analysis of data from the Residential Energy Consumption Surveys ("RECSs") from 1993–2015 indicates that consumers are purchasing higher-capacity refrigerators over time. For example, estimates show that purchases of refrigerators greater than or equal to 22.6 cubic feet rose from 10 percent to 50 percent of the market from 2000 to 2015. In the same time period, sales of refrigerators less than 17.6 cubic feet decreased from 43 percent to 6 percent of the market. DOE seeks data and information on whether the trend towards increased sales of higher-capacity units has continued through 2018 or has leveled off. If the trend has continued, DOE requests data on which capacities have seen significant changes from 2009 to 2018 and by how much. DOE requests input on expected capacity market trends over the next 5 years. Additionally, DOE requests feedback on the drivers of this market shift towards larger-capacity refrigerators.

Issue H.9 In the 2011 Final Rule, DOE developed a lifetime model for standard-size

refrigerator-freezers, standard-size freezers, and compact refrigeration products. In addition, DOE derived a conversion function to model the conversion from primary to secondary refrigerator-freezers. The mean lifetimes were 17.4 years, 22.3 years, 5.6 years, and 7.5 years for standard-size refrigerator-freezers, standard-size freezers, compact refrigerators, and compact freezers, respectively. The primary-to-secondary conversion model indicated that 5.6 percent of standard-size refrigerator-freezer shipments are sold as new secondary units and that roughly 1.5 percent of surviving refrigerator-freezers are converted from primary to secondary each year. Because the conversion and lifetime models affect the shipments analysis (as well as the LCC and payback period ("PBP") analyses), DOE requests data and information to inform the average lifetime of refrigeration products and the conversion of primary to secondary refrigerator-freezers.

I. Manufacturer Impact Analysis

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

As part of the MIA, DOE intends to analyze impacts of amended energy conservation standards on subgroups of manufacturers of covered products, such as small business manufacturers. DOE intends to use 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.[10] Manufacturing of consumer refrigerators, refrigerator-freezers, and freezers is classified under NAICS 335220, "Major Household Appliance Manufacturing," and the SBA sets a threshold of 1,500 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 looking at 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

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

conducts an analysis of cumulative regulatory burden as part of its rulemakings pertaining to appliance efficiency.

Issue I.1 To the extent feasible, DOE seeks the names and contact information of any domestic or foreign-based manufacturers that distribute consumer refrigerators, refrigerator-freezers, and freezers in the United States.

Issue I.2 DOE identified small businesses as a subgroup of manufacturers that could be disproportionally impacted by amended energy conservation standards. DOE requests the names and contact information of small business manufacturers, as defined by the SBA's size threshold, of consumer refrigerators, refrigerator-freezers, and freezers that distribute products in the United States. In addition, DOE requests comment on any other manufacturer subgroups that could be disproportionally impacted by amended energy conservation standards. DOE requests feedback on any potential approaches that could be considered to address impacts on manufacturers, including small businesses.

Issue I.3 DOE requests information regarding the cumulative regulatory burden impacts on manufacturers of consumer refrigerators, refrigerator-freezers, and freezers associated with (1) other DOE standards applying to different products that these manufacturers may also make and (2) product-specific regulatory actions of other Federal agencies. DOE also requests comment on its methodology for computing cumulative regulatory burden and whether there are any flexibilities it can consider that would reduce this burden while remaining consistent with the requirements of EPCA.

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. DOE welcomes comment on any aspect of market failures, especially those in the context of amended energy conservation standards for consumer refrigerators, refrigerator-freezers, and freezers.

2. Other

DOE welcomes comments on other issues relevant to the conduct of this rulemaking that may not specifically be identified in this document. In particular, DOE seeks comment on whether there have been sufficient technological or market changes since the most recent standards update that may justify a new rulemaking to consider more stringent standards. Specifically, DOE seeks data and information that could enable the agency to determine whether a more-stringent standard: (1) would not result in significant additional savings of energy; (2) is not technologically feasible; (3) is not economically justified; or (4) any combination of the foregoing.

DOE also notes that under Executive Order 13771, ‘‘Reducing Regulation and Controlling Regulatory Costs,’’ Executive Branch agencies such as DOE are directed to manage the costs associated with the imposition of expenditures required to comply with Federal regulations. See 82 FR 9339 (February 3, 2017). Consistent with that Executive Order, DOE encourages the public to provide input on measures DOE could take to lower the cost of its

energy conservation standards rulemakings, recordkeeping and reporting requirements, and compliance and certification requirements applicable to consumer refrigerators, refrigerator-freezers, and freezers while remaining consistent with the requirements of EPCA.

III. Submission of Comments

DOE invites all interested parties to submit in writing by [**INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN *FEDERAL REGISTER***], comments and information on matters addressed in this RFI and on other matters relevant to DOE's consideration of amended energy conservations standards for consumer refrigerators, refrigerator-freezers, and freezers. After the close of the comment period, DOE will review the public comments received any may begin collecting data and conducting the analyses discussed in this RFI.

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

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want

to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

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

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

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

as long as it does not include any comments.

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

Signed in Washington, DC, on October 31, 2019.

Alexander N. Fitzsimmons
Acting Deputy Assistant Secretary
for Energy Efficiency
Energy Efficiency and Renewable Energy