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[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 431

[Docket Number EERE–2014-BT-STD-0058]

Energy Conservation Program: Energy Conservation Standards for Residential Clothes Dryers

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

ACTION: Request for information (RFI).

SUMMARY: The U.S. Department of Energy (DOE) is initiating an effort to determine whether to amend the current energy conservation standards for residential clothes dryers. According to the Energy Policy and Conservation Act's 6-year review requirement (42 U.S.C. 6295(m)(1)), DOE must publish a notice of proposed rulemaking to propose amended standards for residential clothes dryers or a notice of determination that the existing standards do not need to be amended by August 24, 2017. This notice seeks to solicit information from the public to help DOE determine whether amended standards for residential clothes dryers would result in a significant amount of additional energy savings and whether those standards would be technologically feasible and economically justified.

DATES: Written comments and information are requested on or before **[INSERT DATE 45 DAYS FOLLOWING PUBLICATION IN FEDERAL REGISTER]**.

ADDRESSES: Interested parties are encouraged to submit comments electronically. Comments may be submitted by any of the following methods:

- Federal eRulemaking Portal: www.regulations.gov. Follow the instructions for submitting comments.
- Email: ResClothesDryers2014STD0058@ee.doe.gov. Include docket number EERE-2014-BT-STD-0058 in the subject line of the message. All comments should clearly identify the name, address, and, if appropriate, organization of the commenter.
- Postal Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, Request for Information for Energy Conservation Standards for Residential Clothes Dryers, Docket No. EERE-2014-BT-STD-0058, 1000 Independence Avenue, SW., Washington, DC 20585-0121. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.
- Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20024. Telephone: (202) 586-2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

Instructions: All submissions received must include the agency name and docket number for this rulemaking. No telefacsimiles (faxes) will be accepted.

Docket: The docket, which includes Federal Register notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials, is available for

review at www.regulations.gov. All documents in the docket are listed in the www.regulations.gov index. However, some documents listed in the index may not be publicly available, such as those containing information that is exempt from public disclosure.

A link to the docket webpage can be found at: http://www.regulations.gov/#!docketDetail;D=EERE-2014-BT-STD-0058. This webpage contains a link to the docket for this notice on the www.regulations.gov website. The www.regulations.gov webpage contains simple instructions on how to access all documents, including public comments, in the docket.

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: ResClothesDryers2014STD0058@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 information on how to submit or review public comments, contact Ms. Brenda Edwards at (202) 586-2945 or by email: Brenda.Edwards@ee.doe.gov.

SUPPLEMENTARY INFORMATION:

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I. Introduction

A. Authority and Background

Title III, Part B[1] of the Energy Policy and Conservation Act of 1975 (EPCA or the Act), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified), established the Energy Conservation Program for Consumer Products Other Than Automobiles.[2] These products include residential clothes dryers, the subject of this Request for Information (RFI).

Pursuant to EPCA, any new or amended energy conservation standard must be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A)) Furthermore, the new or amended standard must result in a significant conservation of energy. (42 U.S.C. 6295(o)(3)(B)) EPCA also

[1] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated Part A.
[2] All references to EPCA in this document refer to the statute as amended through the American Energy Manufacturing Technical Corrections Act (AEMTCA), Pub. L. 112-210 (Dec. 18, 2012).

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

On April 21, 2011, DOE published a direct final rule (2011 Direct Final Rule) amending the energy conservation standards for residential clothes dryers. 76 FR 22454. The amended energy conservation standards were based on a new metric, the combined energy factor (CEF), that incorporates energy use in active mode, standby mode, and off mode. DOE established an initial compliance date of April 24, 2014 for the amended standards. Subsequently, DOE amended the compliance date for the new standards to January 1, 2015. 76 FR 52852 (Aug. 24, 2011).

Thus, DOE must publish either a NOPR proposing amended standards for residential clothes dryers or a notice of determination that the existing standards do not need to be amended by August 24, 2017. This RFI seeks input from the public to assist DOE with its determination on whether new or amended standards pertaining to residential clothes dryers are warranted. In making this determination, DOE must evaluate whether amended standards would: (1) yield a significant savings in energy use; and (2) be both technologically feasible and economically justified. (42 U.S.C. 6295(o)(3)(B))

B. Rulemaking Process

DOE must follow specific statutory criteria for prescribing new or amended standards for covered products, including residential clothes dryers. Any new or amended standard for a covered product must be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A) Furthermore, DOE may not adopt any standard that would not result in the significant conservation of energy. (42 U.S.C. 6295(o)(3)(B)) In deciding whether a proposed standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens. (42 U.S.C. 6295(o)(2)(B)(i)) DOE must make this determination after receiving comments on the proposed standard, and by considering, to the greatest extent practicable, the following seven statutory factors:

1. The economic impact of the standard on the manufacturers and consumers of the affected products;

2. The savings in operating costs throughout the estimated average life of the affected products 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 imposition of the standard;

4. Any lessening of the utility or the performance of the affected products likely to result from the imposition of 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 imposition of 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))

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
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 notice as the first step in the

analysis process and is requesting input and data from interested parties to aid in the development of the technical analyses.

II. Request for Information and Comments

In the next section, DOE has identified a variety of questions that DOE would like to receive input on to aid in the development of the technical and economic analyses regarding whether amended standards for residential clothes dryers may be warranted. In addition, DOE welcomes comments on other issues relevant to the conduct of this rulemaking that may not be identified specifically in this notice. As part of the process for soliciting information, DOE is providing a document titled "APPENDIX – EXAMPLES OF RESIDENTIAL CLOTHES DRYER DATA" (available at http://www.regulations.gov/#!docketDetail;D=EERE-2014-BT-STD-0058) to provide examples of the type of data needed for the rulemaking analyses.

A. Products Covered by This Rulemaking

DOE defines an electric clothes dryer to mean "a cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. The heat source is electricity and the drum and blower(s) are driven by an electric motor(s)." (10 CFR 430.2) Similarly, DOE defines a gas clothes dryer to mean "a cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. The heat source is gas and the drum and blower(s) are driven by an electric motor(s)." (10 CFR 430.2) As part of this rulemaking, DOE intends to address energy conservation standards for both electric and gas clothes dryers.

B. Test Procedure

DOE's test procedures for clothes dryers are codified in appendix D1 and appendix D2 to subpart B of Title 10 of the Code of Federal Regulations (CFR). On January 6, 2011, DOE issued an amended test procedure for residential clothes dryers, in which it (1) adopted the provisions for the measurement of standby mode and off mode energy use along with a new energy efficiency metric, Combined Energy Factor (CEF), that incorporates energy use in active mode, standby mode, and off mode; and (2) adopted several amendments to the clothes dryer test procedure concerning active mode. 76 FR 972. DOE created a new appendix D1 in 10 CFR part 430 subpart B that contained the amended test procedure for clothes dryers.

DOE issued a final rule on August 14, 2013 (August 2013 TP Final Rule), to amend the clothes dryer test procedure, in which it: (1) updated appendix D1 to reference the latest edition of the International Electrotechnical Commission (IEC) Standard 62301, "Household electrical appliances–Measurement of standby power," Edition 2.0 2011-01; (2) amended appendix D1 to clarify the cycle settings used for the test cycle, the requirements for the gas supply for gas clothes dryers, the installation conditions for console lights, the method for measuring the drum capacity, the maximum allowable weighing scale range, and the allowable use of a relative humidity meter; and (3) created a new appendix D2 that includes, in addition to the amendments discussed above, testing methods for measuring the effects of automatic cycle termination. 78 FR 49608. Manufacturers must use either the test procedures in appendix D1 or D2 to demonstrate compliance with energy conservation standards for clothes dryers as of January 1, 2015. Manufacturers must use a single appendix for all representations, including certifications of compliance, and may not use appendix D1 for certain representations and appendix D2 for other representations.

DOE may consider energy conservation standards using the new appendix D2 test method to more accurately account for the effects of automatic cycle termination.

Interested parties have commented publicly, as part of the previous test procedure rulemaking process and more recently through other public channels, that the DOE clothes dryer test procedures may not produce results that are representative of consumer use with regards to test load size and composition, cycle settings for the test cycle, and other provisions in the test procedure. DOE also notes that Oak Ridge National Laboratory (ORNL) and Pacific Northwest National Laboratory (PNNL) recently published reports evaluating clothes dryer performance using the new appendix D2 test method and investigating new automatic cycle termination concepts for improving clothes dryer efficiency.[3] In consideration of these concerns regarding the test procedure and the recent clothes dryer automatic cycle termination research, DOE initiated an effort to determine whether amendments to the test procedure are warranted. DOE held a public meeting on November 13, 2014, to solicit comments from interested parties on potential changes to the clothes dryer test procedure.[4]

C. Market Assessment

[3] K. Gluesenkamp, Residential Clothes Dryer Performance Under Timed and Automatic Cycle Termination Test Procedures, Oak Ridge National Laboratory Report No. ORNL/TM-2014/431 (2014) ("ORNL/TM-2014/431 Report") (Available at: http://web.ornl.gov/sci/buildings/docs/2014-10-09-ORNL-DryerFinalReport-TM-2014-431.pdf); W. TeGrotenhuis, Clothes Dryer Automatic Termination Sensor Evaluation. Volume 1: Characterization of Energy Use in Residential Clothes Dryers, Pacific Northwest National Laboratory Report No. PNNL-23621 (2014) ("PNNL-23621 Report") (Available at: http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-23621.pdf); W. TeGrotenhuis, Clothes Dryer Automatic Termination Sensor Evaluation. Volume 2: Improved Sensor and Control Designs, Pacific Northwest National Laboratory Report No. PNNL-23616 (2014) (Available at: http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-23616.pdf).

[4] The docket for this test procedure rulemaking is available at: http://www.regulations.gov/#!docketDetail;D=EERE-2014-BT-TP-0034.

The market and technology assessment provides information about the residential clothes dryer industry that will be used throughout the rulemaking process. For example, this information will be used to determine whether the existing product class structure requires modification based on technological improvements in the design and manufacturing of such products. DOE uses qualitative and quantitative information to analyze the residential clothes dryer industry and market. DOE will identify and characterize the manufacturers of clothes dryers, estimate market shares and trends, address regulatory and non-regulatory initiatives intended to improve energy efficiency or reduce energy consumption, and explore the potential for technological improvements in the design and manufacturing of clothes dryers. DOE will also review product literature, industry publications, and company websites. Additionally, DOE will consider conducting interviews with manufacturers to assess the overall market for residential clothes dryers.

Product Classes

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

During the previous energy conservation standards rulemaking for residential clothes dryers, DOE established four product classes for vented clothes dryers and two product classes

for ventless clothes dryers. DOE established separate product classes for ventless clothes dryers because of the unique utility they offer consumers, i.e., the ability to have a clothes dryer in a living area where vents are impossible to install, such as an apartment in a high-rise building, where venting dryers would be precluded due to venting restrictions. As part of the previous rulemaking, DOE established product classes for ventless electric compact (240V) clothes dryers and ventless electric combination washer/dryers.[5] The product classes established in the previous energy conservation standards rulemaking are presented in Table II.1.

Table II.1 Existing Clothes Dryer Product Classes

Vented dryers
1. Electric, Standard (4.4 cubic feet (ft^3) or greater capacity)
2. Electric, Compact (120 volts (V)) (less than 4.4 ft^3 capacity)
3. Electric, Compact (240 V) (less than 4.4 ft^3 capacity)
4. Gas
Ventless dryers
5. Electric, Compact (240 V) (less than 4.4 ft^3 capacity)
6. Electric, Combination Washer/Dryer

Based on DOE's review of products available on market, DOE notes that at least one manufacturer offers a ventless clothes dryers with a drum capacity greater than 4.4 cubic feet. As a result, DOE tentatively proposes to establish an additional product class for ventless electric standard clothes dryers listed in Table II.2.

[5] A ventless combination washer/dryer is a device that washes and then dries clothes in the same basket/cavity in a combined cycle.

Table II.2 Proposed Clothes Dryer Product Classes

Vented dryers
7. Electric, Standard (4.4 cubic feet (ft^3) or greater capacity)
8. Electric, Compact (120 volts (V)) (less than 4.4 ft^3 capacity)
9. Electric, Compact (240 V) (less than 4.4 ft^3 capacity)
10. Gas
Ventless dryers
11. Electric, Standard (4.4 ft^3 or greater capacity)
12. Electric, Compact (240 V) (less than 4.4 ft^3 capacity)
13. Electric, Combination Washer/Dryer

Issue C.1 DOE requests feedback on the proposed product classes and seeks information regarding other product classes it should consider for inclusion in its analysis. In particular, DOE requests comment on the determination to consider a separate product class for ventless electric clothes dryers with drum capacities of 4.4 cubic feet or greater. If commenters believe that additional product classes are warranted, DOE requests comment as to how those classes should be configured, as well as energy use data and utility or performance-related information justifying the need for a separate class.

Technology Assessment and Screening Analysis

The purpose of the technology assessment is to develop a preliminary list of technologies that could potentially be used to improve the efficiency of residential clothes dryers. The purpose of the screening analysis is to screen out technologies that are not appropriate for consideration in the engineering analysis due to the following four factors: (1) Technological feasibility, (2) practicability to manufacture, install, and service, (3) impacts on product utility to consumers, and (4) health and safety. (10 CFR 430, subpart C, appendix A, section (4)(a)(4)) The technologies that pass the screening are considered in the engineering analysis.

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 energy conservation standards. In consultation with interested parties, DOE intends to develop a list of technologies to consider in its analysis. Initially, this list will include the technology options considered during the most recent residential clothes dryer standards rulemaking, including those that were screened out in the previous rulemaking.

DOE plans to initially consider all of the technologies for residential clothes dryers identified in the previous standards rulemaking. These technology options are listed in Table II.3.

Table II.3 Technology options for residential clothes dryers

Dryer Control or Drum Upgrades
1. Improved termination
2. Increased insulation
3. Modified operating conditions
4. Improved air circulation
5. Improved drum design
Methods of Exhaust Heat Recovery (Vented Models Only)
6. Recycle exhaust heat
7. Inlet air preheat
8. Inlet air preheat, condensing mode
Heat Generation Options
9. Heat pump, electric only
10. Microwave, electric only
11. Modulating heat
12. Indirect heating
Component Improvements
13. Improved motor efficiency
14. Improved fan efficiency
Standby Power Improvements
15. Switching Power Supply
16. Transformerless Power Supply with Auto-Powerdown

Based on a preliminary review of the clothes dryer market and information published in recent trade publications, technical reports, and manufacturer literature, DOE has observed that the results of the technology screening analysis performed during the previous rulemaking remain largely relevant for this rulemaking.

Issue C.2 DOE seeks information on how the above technologies, and any other technologies that may improve clothes dryer efficiency: (1) apply to the current market; and (2) improve efficiency of clothes dryers as measured according to the DOE test procedure under appendix D2.

D. Engineering Analysis

The engineering analysis estimates the cost-efficiency relationship of products at different levels of increased energy efficiency. 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 cost associated with increasing the efficiency of products above the baseline to the maximum technologically feasible ("max-tech") efficiency level for each product class. The baseline model is used as a reference point for each product class in the engineering analysis and the life-cycle cost and payback-period analyses.

Baseline Models

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 just meets the current minimum energy conservation standards by a small margin.

In developing the baseline efficiency levels, DOE initially considered the current standards for residential clothes dryers manufactured on or after January 1, 2015 presented in Table II.4.

Table II.4 January 1, 2015 Clothes Dryer Energy Conservation Standard Levels

Product Class	CEF (lb/kWh)
Vented dryers	
1. Electric, Standard (4.4 ft^3 or greater capacity)	3.73
2. Electric, Compact (120 v) (less than 4.4 ft^3 capacity)	3.61
3. Electric, Compact (240 v) (less than 4.4 ft^3 capacity)	3.27
4. Gas	3.30
Ventless dryers	
5. Electric, Compact (240 v) (less than 4.4 ft^3 capacity)	2.55
6. Electric, Combination Washer/Dryer	2.08

Since the last standards rulemaking, DOE amended the clothes dryer test procedures as part of the August 2013 TP Final Rule to create a new appendix D2 that includes testing methods for more accurately measuring the effects of automatic cycle termination. Because DOE is proposing to consider energy conservation standards based on the appendix D2 test method, DOE would have to establish baseline efficiency levels considering this new test procedure.

As part of the August 2013 TP Final Rule, DOE presented test data for each product class comparing the efficiencies measured under the appendix D1 and D2 test procedures. 78 FR 49614-15. In addition, ORNL and PNNL conducted testing on separate models according to the appendix D1 and the new appendix D2 test procedures.[6] Table II.5 presents the average measured CEF values using appendix D1 and D2 for each product class using the test data from DOE, ORNL, and PNNL.

[6] ORNL/TM-2014/431 Report at 12; PNNL-23621 Report at 2.1-2.3.

Table II.5 Clothes Dryer Test Data Using Appendix D1 and D2

Product Class	Number of Test Units	Appendix D1	Appendix D2	
		Average CEF (lb/kWh)	Average CEF (lb/kWh)	% Change
Vented Electric Standard	12	3.83	3.19	-16.7
Vented Electric Compact (240V)	4	3.65	3.06	-16.2
Vented Electric Compact (120V)	1	3.75	2.18	-41.9
Vented Gas	8	3.43	2.87	-16.2
Ventless Electric Compact (240V)	1	2.98	2.73	-8.4
Ventless Electric Combination Washer/Dryer	2	2.55	2.45	-3.9

Using these data, DOE developed tentative baseline efficiency levels by applying the percentage difference in efficiency between appendix D1 and D2, as presented in Table II.5, to the energy conservation standards for clothes dryers required on January 1, 2015, presented in Table II.4. The proposed baseline efficiency levels are presented in Table II.6. DOE did not have sufficient data to characterize the baseline efficiency level for the newly proposed product class, ventless electric standard clothes dryers.

Table II.6 Proposed Baseline Efficiency Levels

Product Class	Current Standard CEF (Appendix D1) (lb/kWh)	Proposed Baseline CEF (Appendix D2) (lb/kWh)
Vented dryers		
1. Electric, Standard (4.4 ft3 or greater capacity)	3.73	3.11
2. Electric, Compact (120 v) (less than 4.4 ft3 capacity)	3.61	3.03
3. Electric, Compact (240 v) (less than 4.4 ft3 capacity)	3.27	1.90
4. Gas	3.30	2.77
Ventless dryers		
5. Electric, Standard (4.4 ft3 or greater capacity)	Not Applicable	Not Available
6. Electric, Compact (240 V) (less than 4.4 ft3 capacity)	2.55	2.33
7. Electric, Combination Washer/Dryer	2.08	2.00

Issue D.1 DOE requests comment on approaches that it should consider when determining the baseline efficiency levels for each product class, including information regarding the merits and/or limitations of such approaches. DOE also requests additional test data to characterize the baseline efficiency levels for each product class. In particular, DOE requests appendix D2 test data broken down by standby/off mode and active mode energy use for each

product class, including the newly proposed product class for ventless electric standard dryers. DOE requests additional test data for residential clothes dryers showing the difference in measured efficiency using the appendix D1 test procedure and the appendix D2 test procedure.

Higher Efficiency Levels

DOE will analyze each product class to determine the relevant trial standard levels (TSLs) and to develop incremental manufacturing cost data at each higher efficiency level. DOE generally selects incremental efficiency levels based on a review of industry standards and the efficiency of products available on the market.

For the vented clothes dryer product classes, DOE tentatively plans to consider an efficiency level associated with the current standard level nominal values without the adjustment used to develop the baseline efficiency levels discussed above. Because there is a large gap between these two efficiency levels, DOE is tentatively planning to consider evenly spaced gap fill efficiency levels. DOE also plans to consider efficiency levels corresponding to the Environmental Protection Agency's (EPA) Version 1.0 ENERGY STAR performance specification requirements[7] and the ENERGY STAR 2014 Emerging Technology Award criteria for advanced clothes dryers.[8] Table II.7 shows the proposed efficiency levels for the vented clothes dryer product classes.

[7] ENERGY STAR Program Requirements Product Specification for Clothes Dryers: Eligibility Criteria Version 1.0, (May 19, 2014) (Available at: http://www.energystar.gov//products/certified-products/detail/17517/partners).
[8] ENERGY STAR 2014 Emerging Technology Award Criteria for Advanced Clothes Dryers, (May 13, 2014) (Available at: http://www.energystar.gov/about/awards/energy-star-emerging-technology-award/2014-emerging-technology-award-advanced-clothes-dryers).

Table II.7 Efficiency levels under consideration for vented clothes dryers

Level	Efficiency Level Description	Integrated Efficiency Level (CEF) (lb/kWh)			
		Electric Standard	Electric Compact (120V)	Electric Compact (240V)	Gas
Baseline	DOE Standard w/ Adjusted Appendix D2 Energy Use	3.11	2.10	2.74	2.77
1	Gap Fill	3.31	2.60	2.92	2.94
2	Gap Fill	3.52	3.11	3.09	3.12
3	DOE Standard	3.73	3.61	3.27	3.30
4	ENERGY STAR Performance Specification	3.93	3.80	3.45	3.48
5	ENERGY STAR 2014 Emerging Technology Award	4.3	4.3	4.3	4.0

For the ventless electric compact (240V) clothes dryer and ventless electric combination washer/dryer product classes, DOE is again proposing an incremental efficiency level associated with the current standard level nominal values. For ventless electric compact (240V) clothes dryers, DOE is proposing an additional gap fill level between the baseline and the current standard level nominal value. DOE also plans to consider efficiency levels corresponding to the Version 1.0 ENERGY STAR performance specification requirements and the ENERGY STAR 2014 Emerging Technology Award criteria. For ventless electric combination washer/dryers, because limited data are available regarding the efficiency of products measured according to the new appendix D2 test procedure, DOE is tentatively proposing to consider efficiency levels corresponding to the relative increase in efficiency levels considered for the 2011 Direct Final Rule analysis. For ventless electric standard clothes dryers, DOE notes that one recently introduced ventless electric standard clothes dryer qualifies for the ENERGY STAR 2014 Emerging Technology Award. DOE plans to consider an efficiency level associated with this unit. However, DOE is unaware of any data to determine other incremental efficiency levels for ventless electric standard clothes dryers. The proposed efficiency levels for the ventless clothes dryer product classes are presented in Table II.8 and Table II.9.

Table II.8 Efficiency levels under consideration for ventless electric standard and compact (240V) clothes dryers

Level	Efficiency Level Description	Integrated Efficiency Level (CEF) (lb/kWh)	
		Electric Standard	Electric Compact (240V)
Baseline	DOE Standard w/ Adjusted Appendix D2 Energy Use	N/A	2.33
1	Gap Fill	N/A	2.44
2	DOE Standard	N/A	2.55
3	ENERGY STAR Performance Specification	N/A	2.68
4	ENERGY STAR 2014 Emerging Technology Award	4.5	4.3

Table II.9 Efficiency levels under consideration for ventless electric combination washer/dryers

Level	Efficiency Level Description	Integrated Efficiency Level (CEF) (lb/kWh)
		Electric Combination Washer/Dryer
Baseline	DOE Standard w/ Adjusted Appendix D2 Energy Use	2.00
1	DOE Standard	2.08
2	2011 Direct Final Rule Analysis Gap Fill	2.26
3	EL 2 + 1.5 Watt Standby	2.29
4	EL 3 + 0.08 Watt Standby	2.36
5	Gap Fill	2.46
6	Max-Tech (Heat Pump)	3.55

Issue D.3 DOE seeks input concerning the efficiency levels it tentatively plans to use for each product class for collecting incremental cost data from manufacturers of residential clothes dryers. In particular, DOE seeks additional data on the efficiency of products measured according to the new appendix D2 test procedure to characterize the range of efficiencies available on the market for each product class. DOE also seeks input on appropriate maximum technologically feasible efficiency levels whether any additional intermediate efficiency levels should be considered and the basis for why those levels should be selected.

Approach for Determining the Cost-Efficiency Relationship

In order to create the cost-efficiency relationship, DOE intends to use an efficiency-level

approach, supplemented with reverse engineering (physical teardowns and testing of existing products in the market), to identify the incremental cost and efficiency improvement associated with each efficiency level.

DOE will analyze technologies and associated costs representative of baseline units as part of the reverse-engineering process. DOE intends to perform reverse engineering for each product class being analyzed. Whenever possible, DOE will attempt to reverse engineer test units that share similar platforms to better identify the efficiency benefits and costs of design options. As units are torn down, all design options used in them are noted and reviewed. Prior to tear down, DOE also plans to conduct limited testing to establish what control strategies are being used by manufacturers in conjunction with design options and platform design. Unit testing may include the measurement of disaggregated energy consumption to identify the relationship between particular components and control strategies taken by manufacturers to achieve higher efficiency levels. As part of the reverse-engineering process, DOE will attempt to generate a cost-efficiency relationship for each efficiency level identified. DOE also requests incremental cost data for each efficiency level. DOE intends the data to represent the average industry-wide incremental production cost for each technology.

To be useful in the manufacturer impact analysis, manufacturer cost information should reflect the variability in baseline models, design strategies, and cost structures that can exist among manufacturers. This information allows DOE to better understand the industry and its associated cost structure, and helps DOE predict the most likely impact of new energy efficiency regulations. For example, the reverse-engineering methodology allows DOE to estimate the

"green-field" costs of building new facilities, yet the majority of plants in any given industry are comprised of a mix of assets in different stages of depreciation. Interviews with manufacturers not only help DOE refine its capital expenditure estimates, but they also allow DOE to refine its estimates regarding depreciation and other financial parameters.

DOE will refine the cost-efficiency data it generates through the reverse-engineering activities with information obtained through follow-up manufacturer interviews and, as necessary, information contained in the market and technology assessment and further review of publicly available cost and performance information.

Issue D.5 DOE requests feedback on using an efficiency-level approach supplemented with reverse engineering to determine the relationship between manufacturer cost and energy efficiency for residential clothes dryers.

Issue D.6 DOE also requests incremental cost data for each clothes dryer efficiency level as well as information about the design options associated with each efficiency level. DOE intends the data to represent the average industry-wide incremental production cost for each technology.

EPCA also requires DOE to consider any lessening of the utility or the performance of a covered product likely to result from the imposition of a new standard. (42 USC 6295(o)(2)(B)(i)(IV)) As part of its analysis of higher efficiency levels, DOE will consider whether new standards may impact the utility of residential clothes dryers.

Issue D.7 DOE seeks comment on whether any new standards may impact the utility of clothes dryers. If such impacts exist, can the effects be quantified? If so, how?

E. Markups Analysis

To carry out the life-cycle cost (LCC) and payback period (PBP) calculations, DOE needs to determine the cost to the residential consumer of baseline products that satisfies the currently applicable standards, and the cost of the more-efficient unit the consumer would purchase under potential amended standards. By applying a multiplier called a "markup" to the manufacturer's selling price, DOE is able to estimate the residential consumer's price.

For the 2011 Direct Final Rule, DOE used distribution channels, based on data from the Association of Home Appliance Manufacturers (AHAM), to characterize how products pass to the consumer. For clothes dryers, the main actors are manufacturers and retailers. Thus, DOE analyzed a manufacturer-to-consumer distribution channel consisting of three parties: (1) the manufacturers producing the products; (2) the retailers purchasing the products from manufacturers and selling them to consumers; and (3) the consumers who purchase the products. DOE plans to use the same approach in the current rulemaking.

As was done in the last rulemaking and consistent with the approach followed for other energy consuming products, DOE will determine an average manufacturer markup by considering the annual Securities and Exchange Commission (SEC) 10-K reports filed by

publicly traded manufacturers of appliances whose product range includes clothes dryers. DOE then revises the initial manufacturer markup estimate based on feedback received during manufacturer interviews. DOE will determine an average retailer markup by analyzing both economic census data from the U.S. Census Bureau and the annual SEC 10-K reports filed by publicly traded retailers.

In addition to manufacturer and retailer markups, DOE will include sales tax in its retail price calculations. DOE will use an Internet source, the Sales Tax Clearinghouse, to calculate applicable sales taxes.

Issue E.1 DOE seeks input from stakeholders on whether the distribution channels described above are still relevant for residential clothes dryers. DOE also welcomes comments concerning its proposed approach to developing estimates of markups for clothes dryers.

F. Energy Use Analysis

The purpose of the energy analysis is to assess the energy-savings potential of different product efficiencies. DOE uses the annual energy consumption and energy-savings potential in the LCC and PBP analyses to establish the savings in consumer operating costs at various product efficiency levels. In contrast to the DOE test procedure, which provides a measure of the energy use, energy efficiency or annual operating cost of a covered product during a representative average use cycle, the energy use analysis captures a range of operating conditions for clothes dryers in U.S. homes.

For the 2011 Direct Final Rule, DOE developed distributions of values for several operating conditions, including number of cycles, remaining moisture content (RMC), and load weights that reflect its best estimate of the range of practices found in U.S. homes. 76 FR 22508. DOE also evaluated the indirect impact of a clothes dryer standard on heating and cooling loads in a household. To calculate this impact, DOE first characterized the location of the clothes dryers in a conditioned space based on the Energy Information Administration's (EIA's) 2005 Residential Energy Consumption Survey (RECS), and the 2009 American Housing Survey (AHS). For these installations, DOE utilized the results from a European Union study about the impacts of clothes dryers on home heating and cooling loads to determine the appropriate factor to apply to the total clothes dryer energy use.[9]

To determine the field energy use of products that would be required to meet amended standard levels, DOE proposes to use data from the EIA's 2009 RECS, or the most recent such survey available from EIA.[10] RECS is a national sample survey of housing units that collects statistical information on the consumption of and expenditures for energy in housing units along with data on energy-related characteristics of the housing units and occupants. RECS provides sufficient information to establish the type (product class) of clothes dryer used in each household. As a result, DOE will be able to develop household samples for each of the considered product classes.

DOE requests comment or seeks input from stakeholders on the following issues

[9] I. Rüdenauer and C.O. Gensch, Energy demand of tumble dryers with respect to differences in technology and ambient conditions. Report commissioned by European Committee of Domestic Equipment Manufacturers (CECED) (January 13, 2004) (Available at: www.oeko.de/oekodoc/202/2004-009-en.pdf).

[10] U.S. Department of Energy: Energy Information Administration, Residential Energy Consumption Survey: 2009 RECS Survey Data (2013) (Available at: http://www.eia.gov/consumption/residential/data/2009/).

pertaining to the energy use analysis:

Issue F.1 Approaches for specifying the typical annual energy consumption of residential clothes dryers;

Issue F.2 Data sources that DOE can use to characterize the variability in annual energy consumption of clothes dryers.

Issue F.3 Data sources to characterize the indirect impact of dryer energy use on heating and cooling loads of a household.

G. Life-Cycle Cost and Payback Period Analysis

The purpose of the LCC and PBP analysis is to analyze the effects of potential amended energy conservation standards on consumers of residential clothes dryers by determining how a potential amended standard affects the consumers' operating expenses (usually decreased) and total installed costs (usually increased).

DOE intends to analyze data input variability and uncertainty by performing the LCC and PBP calculations on a representative sample of households from RECS for the considered product classes using Monte Carlo simulations and probability distributions. The analysis results are a distribution of results showing the range of LCC savings and PBPs for a given efficiency level relative to the baseline level.

Inputs to the LCC and PBP analysis are categorized as: (1) inputs for establishing the

purchase expense, otherwise known as the total installed cost, and (2) inputs for calculating the operating expense. The primary inputs for establishing the total installed cost are the baseline consumer price, standard-level consumer price increases, and installation costs. Baseline consumer prices and standard-level consumer price increases will be determined by applying markups to manufacturer price estimates. The installation cost is added to the consumer price to arrive at a total installed cost.

In the 2011 Direct Final Rule, DOE derived the installation costs from RS Means 2008. 76 FR 22513. DOE plans to use similar data sources for this rulemaking, with adjustments to reflect current-day labor and material prices as well as to scale installation cost for higher-efficiency products based on equipment weight and/or dimensions.

Issue G.1 DOE seeks input on whether clothes dryer installation costs scale with equipment weight and/or dimensions.

The primary inputs for calculating the operating costs are product energy consumption, product efficiency, electricity prices and forecasts, maintenance and repair costs, product lifetime, and discount rates.

Repair costs are associated with repairing or replacing components that have failed in the appliance, whereas maintenance costs are associated with maintaining the operation of the equipment. In the 2011 Direct Final Rule, DOE derived annualized maintenance and repair frequencies based on Consumer Reports data on repair and maintenance issues for clothes dryers

during the first 4 years of ownership. DOE estimated that on average 1.5 percent of electric and 1.75 percent of gas clothes dryers are maintained or repaired each year. Based on RS Means Facilities Maintenance & Repair 2010 Cost Data,[11] DOE also estimated that an average service call and any necessary repair or maintenance takes about 2.5 hours. DOE further estimated that the average material cost is equal to one-half of the equipment cost. The values for cost per service call were then annualized by multiplying by the frequencies and dividing by the average equipment lifetime of 16 years. 76 FR 22514. DOE plans to use similar data sources for this rulemaking.

In the 2011 Direct Final Rule, DOE also assumed that repair costs vary in direct proportion with the product price at higher efficiency levels as replacement costs for more-efficient components are likely to be greater than replacement costs for components in baseline products.

Issue G.2 DOE seeks stakeholder input on the approach for estimating repair and maintenance costs for more efficient clothes dryers. DOE also seeks stakeholder comment on the assumption that repair costs vary in direct proportion to product price as well as historical repair cost data as a function of efficiency.

DOE measures LCC and PBP impacts of potential standard levels relative to a base case that reflects the market in the absence of amended standards. DOE plans to develop market-share efficiency data (i.e., the distribution of product shipments by efficiency) for the product

[11] Available at: http://rsmeans.reedconstructiondata.com/60300.aspx

classes DOE is considering, for the year in which compliance with any amended or new standards would be required. By accounting for consumers who already purchase more efficient products, DOE avoids overstating the potential benefits from new or amended standards.

Issue G.4 DOE seeks stakeholder input and data on the fraction of clothes dryers sold that exceed the minimum energy efficiency standards. DOE also requests information on expected trends in product efficiency over the next five years.

H. Shipments Analysis

DOE uses shipment projections by product class and efficiency level in its analysis of the national impacts of potential standards, as well as in the manufacturer impact analysis.

In the 2011 Direct Final Rule, DOE developed a shipments model for clothes dryers driven by historical shipments data. 76 FR 22516. The key drivers of the shipments model included the new owner and replacement markets.

Issue H.1 DOE seeks stakeholder input and data showing the distribution of shipments by product class.

In the 2011 Direct Final Rule, DOE modeled the decision to repair or replace equipment for existing owners and the impact that decision would have on the shipments model. DOE estimated how increases in product purchase price and decreases in product operating costs due

to standards affect product shipments.[12]

Issue H.2 DOE seeks input and data on factors that influence a consumer's decisions to repair or replace failed products.

I. National Impact Analysis

The purpose of the national impact analysis (NIA) is to estimate aggregate impacts of potential efficiency standards at the national level. Impacts reported by DOE include the national energy savings (NES) from potential standards and the national net present value (NPV) of the total consumer benefits. The NIA considers lifetime impacts of potential standards on clothes dryers shipped in a 30-year period that begins with the expected compliance date for new or amended standards.

To develop the NES, DOE calculates annual energy consumption of clothes dryers in households for the base case and each standards case. To develop the national NPV of consumer benefits from potential standards, DOE calculates national annual energy expenditures and annual product expenditures for the base case and the standards cases. DOE calculates total annual energy expenditures using data on annual energy consumption in each case, forecasted average annual energy prices, and shipment projections. The difference each year between operating cost savings and increased product expenditures is the net savings or net costs.

[12] DOE-Energy Efficiency and Renewable Energy, Energy Conservation Program for Consumer Products, Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment, Residential Clothes Dryers and Room Air Conditioners, chapter 9 (2011) (Available at: http://www.regulations.gov/#!documentDetail;D=EERE-2007-BT-STD-0010-0053).

A key component of DOE's estimates of NES and NPV is the product energy efficiency forecasted over time for the base case and for each of the standards cases. In the 2011 Direct Final Rule, DOE based projections of base-case shipment-weighted efficiency (SWEF) for the clothes dryer product classes on growth rates determined from historical data provided by AHAM.[13] For this rulemaking, DOE plans on considering recent trends in efficiency and input from stakeholders to update product energy efficiency forecasts.

Issue I.1 DOE seeks historical SWEF data for residential clothes dryers by product class and stakeholder input regarding future trends in efficiency.

J. Manufacturer Impact Analysis

The purpose of the manufacturer impact analysis (MIA) is to estimate the financial impact of potential energy conservation standards on manufacturers of residential clothes dryers and to evaluate the potential impact of such standards on competition, 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 used to estimate a range of potential impacts on manufacturer profitability. The qualitative part of the MIA addresses a proposed standard's potential impacts on manufacturing capacity and industry competition, as well as factors such as product characteristics, impacts on particular subgroups of firms, and key issues from the manufacturers' perspective.

As part of the MIA, DOE intends to analyze impacts of potential energy conservation

[13] *Id.* chapter 10.

standards on small business manufacturers of covered products. DOE intends to use the Small Business Administration's (SBA) small business size standards to determine whether manufacturers qualify as small businesses. The size standards are listed by North American Industry Classification System (NAICS) code and industry description.[14] Manufacturing of residential clothes dryers is classified under NAICS 335224, "Household Laundry Equipment Manufacturing." The SBA sets a threshold of 1,000 employees or less for an entity to be considered as a small business for this category. This 1,000-employee threshold would include all employees in a business's parent company and any other subsidiaries.

DOE intends to conduct a market survey using publicly available information to identify potential small manufacturers using the above-mentioned size threshold. In identifying potential small businesses, DOE generally uses its Compliance Certification Management System (CCMS), industry trade association membership directories (including AHAM), individual company websites, and market research tools (e.g., Hoovers reports) to create a list of companies that manufacture or sell products covered by this rulemaking.

Issue J.1 DOE requests comment on whether there are any small business manufacturers of residential clothes dryers that it should consider in its analysis.

III. Submission of Comments

DOE invites all interested parties to submit in writing by [INSERT DATE **45** DAYS FOLLOWING PUBLICATION IN FEDERAL REGISTER], comments and information on matters addressed in this notice and on other matters relevant to DOE's consideration of new or

[14] Available at: http://www.sba.gov/content/small-business-size-standards.

amended energy conservations standards for residential clothes dryers. After the close of the comment period, DOE will collect data, conduct analyses, and review public comments, as needed. These actions will aid in the development of a NOPR for residential clothes dryers if DOE decides to amend the standards for such products.

DOE considers public participation to be a very important part of the process for developing test procedures and 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 rulemaking should contact Ms. Brenda Edwards at (202) 586–2945, or via e-mail at Brenda.Edwards@ee.doe.gov.

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Energy Efficiency and Renewable Energy