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Energy Conservation Program: Energy Conservation Standards for Certain Consumer Products (Dishwashers, Dehumidifiers, Microwave Ovens, and Electric and Gas Kitchen Ranges and Ovens) and for Certain Commercial and Industrial Equipment (Commercial Clothes Washers); Proposed Rule

DEPARTMENT OF ENERGY

10 CFR Part 431

[Docket Number EERE–2006–STD–0127]

RIN 1904–AB93

Energy Conservation Program: Energy Conservation Standards for Certain Consumer Products (Dishwashers, Dehumidifiers, Microwave Ovens, and Electric and Gas Kitchen Ranges and Ovens) and for Certain Commercial and Industrial Equipment (Commercial Clothes Washers)

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

ACTION: Supplemental notice of proposed rulemaking and notice of public meeting.

SUMMARY: On October 17, 2008, the U.S. Department of Energy (DOE) issued a notice of proposed rulemaking (NOPR) in which DOE proposed amendments to the energy conservation standards for several residential products and commercial equipment, including commercial clothes washers (CCWs). DOE decided to conduct additional, supplemental rulemaking analyses for CCWs to address certain alleged data problems. Today's document details these supplemental analyses and proposes revised CCW standard levels for consideration.

DATES: DOE will hold a public meeting on November 16, 2009, from 9 a.m. to 5 p.m., in Washington, DC. DOE must receive requests to speak at the public meeting and receive a signed original and an electronic copy of statements to be given at the public meeting before 4 p.m., November 13, 2009.

DOE will accept comments, data, and information regarding the supplemental notice of proposed rulemaking (SNOPR) received not later than December 9, 2009. See section VII, ''Public Participation,'' of today's supplemental notice for details.

ADDRESSES: The public meeting will be held at the U.S. Department of Energy, Forrestal Building, 1E–245, 1000 Independence Avenue, SW., Washington, DC 20585. (Please note that foreign nationals visiting DOE Headquarters are subject to advanced security screening procedures. If you are a foreign national and wish to participate in the workshop, please inform DOE of this fact as soon as possible by contacting Ms. Brenda Edwards at (202) 586–2945 so that the necessary procedures can be completed.)

Any comments submitted must identify the SNOPR for Energy Conservation Standards for Home Appliance Products, and provide docket number EERE–2006–STD–0127 and/or regulatory information number (RIN) 1904–AB93. Comments may be submitted using any of the following methods:

1. *Federal eRulemaking Portal: http://www.regulations.gov*. Follow the instructions for submitting comments.

2. *E-mail: home_appliance.rulemaking@ee.doe.gov*. Include docket number EE–2006–STD–0127 and/or RIN number 1904–AB93 in the subject line of the message.

3. *Postal Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Please submit one signed original paper copy.

4. *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Room 1J–018, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Telephone: (202) 586–2945. Please submit one signed original paper copy.

For detailed instructions on submitting comments and additional information on the rulemaking process, see section VII, ''Public Participation,'' of today's supplemental notice for details.

Docket: For access to the docket to read background documents or comments received, visit the U.S. Department of Energy, Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20585–0121, (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please call Ms. Brenda Edwards at the above telephone number for additional information regarding visiting the Resource Room.

FOR FURTHER INFORMATION CONTACT: Mr. Stephen Witkowski, U.S. Department of Energy, Energy Efficiency and Renewable Energy, Building Technologies Program, EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Telephone: (202) 586–7463. E-mail: *Stephen.Witkowski@ee.doe.gov*.

Ms. Francine Pinto, Esq. or Ms. Betsy Kohl, Esq., U.S. Department of Energy, Office of General Counsel, GC–71/72, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Telephone: (202) 586–5000. E-mail: *Francine.Pinto@hq.doe.gov*, *Elizabeth.Kohl@hq.doe.gov*.

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I. Summary of the Proposed Rule

The Energy Policy and Conservation Act [1] (EPCA), as amended, provides that any amended energy conservation standard DOE prescribes, including those for CCWs, shall be designed to ''achieve the maximum improvement in energy efficiency * * * which the Secretary determines is technologically feasible and economically justified.'' (42 U.S.C. 6295(o)(2)(A) and 6316(a)) Furthermore, any new or amended standard must ''result in significant conservation of energy.'' (42 U.S.C. 6295(o)(3)(B) and 6316(a)) In accordance with these and other statutory criteria discussed in this notice, DOE proposes in today's SNOPR to amend the energy conservation standards for CCWs and raise efficiency levels as shown in Table I.1. The standards would apply to all CCWs manufactured in, or imported into, the United States 3 years after the publication of the final rule in the **Federal Register.**

TABLE I.1—EXISTING AND PROPOSED ENERGY CONSERVATION STANDARDS FOR COMMERCIAL CLOTHES WASHERS

Existing energy conservation standards (effective January 1, 2007)		Proposed energy conservation standards	
Equipment class	Standards	Equipment class	Standards
Commercial clothes washers	1.26 Modified Energy Factor/9.5 Water Factor.	Top-loading commercial clothes washers.	1.6 Modified Energy Factor/8.5 Water Factor.
		Front-loading commercial clothes washers.	2.00 Modified Energy Factor/5.5 Water Factor.

DOE estimates that the energy conservation standards proposed in today's SNOPR would save a significant amount of energy—an estimated 0.10 quadrillion British thermal units (Btu), or quads, of cumulative energy over 30 years (2013–2043). This amount is equivalent to 2 days of U.S. gasoline use. In addition, today's proposed standards for CCWs save over 143 billion gallons of cumulative water consumption over 30 years (2013–2043).

The cumulative national net present value (NPV) of total consumer costs and savings of today's proposed standards from 2013 to 2043, in 2008 dollars (2008$), ranges from $0.4 billion (7-percent discount rate) to $0.9 billion (3-percent discount rate). This is the estimated total value of future operating-cost savings minus the estimated increased equipment costs, discounted to the present year (2009). DOE estimates the CCW industry net present value (INPV) to be approximately $62 million in 2008$. If DOE adopts today's proposed standards, manufacturers expect a decline of between 7.8 percent and 11.4 percent of the INPV, which is approximately $5 to $7 million. However, the NPV for consumers (at the 7-percent discount rate) would exceed industry losses due to energy efficiency standards by at least 80 times.

DOE believes that the impacts of standards on consumers would be positive for CCWs, even though the standards may increase some initial costs. DOE estimates that today's proposed modified energy factor (MEF) and water factor (WF) standards for CCWs would increase the retail price by $214 per unit for top-loading washers and $23 for front-loading washers, but the operating cost savings outweigh these price increases, resulting in positive economic impacts to CCW consumers.

DOE's analyses indicate that the energy savings resulting from today's proposed standards would have benefits to utilities and to the environment. The energy saved is in the form of electricity and natural gas, and DOE expects the energy savings from today's proposed standards to eliminate the need for approximately 18 megawatts (MW) of generating capacity by 2043. This result reflects DOE's use of energy price projections from the U.S. Energy Information Administration (EIA)'s April 2009 release of the *Annual Energy Outlook 2009* (*AEO 2009*) reflecting provisions of the American Recovery and Reinvestment Act of 2009 (ARRA 2009; Pub. L. 111–5). DOE intends to use the most recently available version of EIA's *AEO* to generate the results for the final rule.

In addition, today's proposed standards would have environmental benefits, which would be estimated to result in cumulative (undiscounted) greenhouse gas emission reductions of 5.1 million tons (Mt) of carbon dioxide (CO_2) from 2013 to 2043. DOE estimates that the range of the monetized value of

[1] 42 U.S.C. 6291 *et seq.*

CO_2 emission reductions based on global estimates of the value of CO_2 is $13 million to $140 million at a 7-percent discount rate and $28 million to $303 million at a 3-percent discount rate. The standards for CCWs would also result in 3.04 kilotons (kt) of nitrogen oxides (NO_X) emissions reductions from 2013 to 2043. The standards for CCWs would also possibly result in power plant mercury (Hg) emissions reductions of up to 0.03 t from 2013 to 2043.

The benefits and costs of today's proposed standards can also be expressed in terms of annualized (2008$) values from 2013–2043. Estimates of annualized values are shown in Table I.2. The annualized monetary values are the sum of the annualized national economic value of operating savings benefits (energy, maintenance and repair), expressed in 2008$, plus the monetary values of the benefits of carbon dioxide emission reductions, otherwise known as the Social Cost of Carbon (SCC) expressed as $19 per metric ton of carbon dioxide, in 2007$. The $19 value is a central interim value from a recent interagency process. Although this $19 value represents emissions that are valued in 2007$, the monetary benefits of cumulative emissions reductions are reported in 2008$ so that they can be compared with the other costs and benefits in the same dollar units. The derivation of this value is discussed in section V.B.6. Although summing the value of operating savings to the values of CO_2 reductions provides a valuable perspective, please note the following: 1) the national operating savings are domestic U.S. consumer monetary savings found in market transactions while the CO_2 value is based on a range of estimates of imputed marginal social cost of carbon from $5 to $55 per metric ton (2007$), which are meant to reflect the global benefits of carbon dioxide reductions; and 2) the assessments of operating savings and CO_2 savings are performed with different computer models, leading to different time frames for analysis. The present value of national operating savings is measured for the period 2013–2065 (31 years from 2013 to 2043 inclusive, plus the lifetime of the longest-lived equipment shipped in the 31st year), then converted the annualized equivalent for the 31 years. The value of CO_2, on the other hand is meant to reflect the present value of all future climate related impacts, even those beyond 2065.

Using a 7-percent discount rate for the annualized cost analysis, the combined cost of the standards established in today's notice for CCWs is $23.4 million per year in increased equipment and installation costs, while the annualized benefits are $60.6 million per year in reduced equipment operating costs and $5.1 million in CO_2 reductions, for a net benefit of $42.2 million per year. Using a 3-percent discount rate, the cost of the standards established in today's final rule is $22.7 million per year in increased equipment and installation costs, while the benefits of today's standards are $72.8 million per year in reduced operating costs and $5.9 million in CO_2 reductions, for a net benefit of $56.0 million per year.

TABLE I.2—ANNUALIZED BENEFITS AND COSTS FOR COMMERCIAL CLOTHES WASHERS

Category	Primary estimate (AEO reference case)	Low estimate (low growth case)	High estimate (high growth case)	Units		
				Year dollars	Disc (in percent)	Period covered
Benefits						
Annualized Monetized (millions$/year)	60.6	54.9	66.6	2008	7	31
	72.8	65.3	80.4	2008	3	31
Annualized Quantified	0.14 CO_2 (Mt)	0.14 CO_2 (Mt)	0.14 CO_2 (Mt)	NA	7	31
	0.087 NO_X (kt)	0.087 NO_X (kt)	0.087 NO_X (kt)	NA	7	31
	0.001 Hg (t)	0.001 Hg (t)	0.001 Hg (t)	NA	7	31
	0.16 CO_2 (Mt)	0.16 CO_2 (Mt)	0.16 CO_2 (Mt)	NA	3	31
	0.094 NO_X (kt)	0.094 NO_X (kt)	0.094 NO_X (kt)	NA	3	31
	0.001 Hg (t)	0.001 Hg (t)	0.001 Hg (t)	NA	3	31
CO_2 Monetized Value (at $19/Metric Ton, millions$/year).	5.1	5.1	5.1	2008	7	31
	5.9	5.9	5.9	2008	3	31
Total Monetary Benefits (millions$/year)*	65.7	59.9	71.6	2008	7	31
	78.7	71.2	86.3	2008	3	31
Qualitative.						
Costs						
Annualized Monetized (millions$/year)	23.4	21.9	24.6	2008	7	31
	22.7	20.9	23.9	2008	3	31
Qualitative.						
Net Benefits/Costs						
Annualized Monetized, including Carbon Benefits* (million$/year).	42.2	38.1	47.0	2008	7	31
	56.0	50.3	62.4	2008	3	31
Qualitative.						

*Per the above discussion, this represents a simplified estimate that includes both 2007$ and 2008$.

In sum, today's proposed standards represent the maximum improvement in energy and water efficiency that is technologically feasible and economically justified. DOE found that the benefits of today's proposed standards (energy and water savings, consumer average life-cycle cost (LCC) savings, national NPV increase, and emissions reductions) outweigh the costs (loss of INPV and LCC increases for some consumers). DOE has concluded that the standards proposed in today's SNOPR are economically justified and technologically feasible, particularly since units achieving these standard levels are already commercially available. DOE notes that it considered higher efficiency levels as trial standard levels (TSLs), and is still considering them in this rulemaking; however, DOE tentatively believes that the burdens of the higher efficiency levels (loss of INPV and LCC increases for some consumers) outweigh the benefits (energy savings, LCC savings for some consumers, national NPV increase, and emissions reductions). After reviewing public comments on this SNOPR, DOE may ultimately decide to adopt one of the other TSLs or another value in between.

II. Introduction

A. Consumer Overview

DOE is proposing in today's SNOPR energy conservation standard levels for CCWs as shown in Table I.1 above. These proposed standards would apply to equipment manufactured or imported 3 years after the date the final rule is published in the **Federal Register**.[2]

DOE research suggests that commercial consumers will see benefits from today's proposed standards even though DOE expects the purchase price of the high efficiency CCWs to increase (by 2 to 28 percent) from the average price of this equipment today. However, the energy efficiency gains are expected to result in lower energy and water costs, saving consumers $53 to $103 per year on their energy and water bills, again depending on the equipment class. When these savings are summed over the lifetime of the equipment, consumers are expected to save an average of $20 to $190, depending on the equipment class, utility costs, and other factors. DOE estimates that the payback period for the more efficient, higher-priced equipment will range from 0.2 to 5.6 years, depending on the equipment class.

B. Authority

Title III of EPCA sets forth a variety of provisions designed to improve energy efficiency. Part A–1 of Title III (42 U.S.C. 6311–6317) establishes an energy conservation program for ''Certain Industrial Equipment,'' which deals with a variety of commercial and industrial equipment (referred to hereafter as ''covered equipment'') including CCWs. (42 U.S.C. 6312; 6313(e)) EPCA sets both energy and water efficiency standards for CCWs, and authorizes DOE to amend both. (42 U.S.C. 6313(e))

Section 136(a) and (e) of the Energy Policy Act of 2005 (EPACT 2005; Pub. L. 109–058) added CCWs as equipment covered under EPCA and established standards for such equipment that is manufactured on or after January 1, 2007.[3] (42 U.S.C. 6311(1) and 6313(e)) These amendments to EPCA also require that DOE issue a final rule by January 1, 2010, to determine whether these standards should be amended. (EPACT 2005, section 136(e); 42 U.S.C. 6313(e)) If amended standards are justified, they would become effective no later than January 1, 2013. (*Id.*)

It is pursuant to the authority set forth above that DOE is conducting the present rulemaking for CCWs. The following discusses some of the key provisions of EPCA relevant to this standards-setting rulemaking.

Under EPCA, the overall program consists of the following core elements: (1) Testing; (2) labeling; and (3) Federal energy conservation standards. The Federal Trade Commission (FTC) is responsible for labeling equipment covered by part A, and DOE implements the remainder of the program. Under 42 U.S.C. 6293 and 6314, EPCA authorizes DOE, subject to certain criteria and conditions, to develop test procedures to measure the energy efficiency, energy use, or estimated annual operating cost of covered equipment. The test procedures for CCWs appear at 10 CFR part 430, subpart B, appendix J1 (pursuant to 10 CFR 431.154).

EPCA provides criteria for prescribing new or amended standards for covered products and equipment.[4] As indicated above, any new or amended 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) and 6316(a)) The statute also provides that, in deciding whether a standard is economically justified, DOE must, after receiving comments on the proposed standard, determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

(1) The economic impact of the standard on manufacturers and consumers of the products or equipment subject to the standard;

(2) The savings in operating costs throughout the estimated average life of the covered products or equipment in the type (or class) compared to any increase in the price, initial charges, or maintenance expenses for the covered products that are likely to result from the imposition of the standard;

(3) The total projected amount of energy (or, as applicable, water) savings likely to result directly from the imposition of the standard;

(4) Any lessening of the utility or the performance of the covered products or equipment 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 considers relevant. (42 U.S.C. 6295(o)(2)(B)(i) and 6316(a))

Furthermore, EPCA contains what is commonly known as an ''anti-backsliding'' provision. (42 U.S.C. 6295(o)(1)) This provision prohibits the Secretary from prescribing any amended standard that either increases the maximum allowable energy use or decreases the minimum required energy efficiency of a covered product or equipment. Also, the Secretary may not prescribe an amended or a new standard if the Secretary finds that interested persons have established by a preponderance of the evidence that the standard is likely to result in the unavailability in the United States of any product type (or class) with performance characteristics, features, sizes, capacities, and volume that are substantially the same as those generally available in the United States at the time of the Secretary's finding. (42 U.S.C. 6295(o)(4))

In addition, EPCA, as amended (42 U.S.C. 6295(o)(2)(B)(iii)), establishes a

[2] DOE anticipates publishing a final rule for commercial clothes washer energy conservation standards by January 1, 2010, pursuant to the requirements of the Energy Policy Act of 2005 (EPACT 2005; Pub. L. 109–058), which would make any amended standards effective on January 1, 2013.

[3] Under the statute, a CCW must have a modified energy factor (MEF) of at least 1.26 and a water factor (WF) of not more than 9.5.

[4] The EPCA provisions discussed in the remainder of this subsection directly apply to covered products, and also apply to certain covered equipment, such as CCWs, by virtue of 42 U.S.C. 6316(a). Note that the term ''product'' is used generally to refer to consumer appliances, while ''equipment'' is used generally to refer to commercial units.

rebuttable presumption that a standard is economically justified if the Secretary finds that ''the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy (and as applicable, water) savings during the first year that the consumer will receive as a result of the standard,'' as calculated under the test procedure in place for that standard. (42 U.S.C. 6295(o)(2)(B)(iii)) See Section II.G.2.

In promulgating a standard for a type or class of covered product or equipment that has two or more subcategories, DOE must specify a different standard level from that which applies generally to such type or class of products or equipment ''for any group of covered products which have the same function or intended use, if * * * covered products within such group—(A) consume a different kind of energy from that consumed by other covered products within such type (or class); or (B) have a capacity or other performance-related feature which other products within such type (or class) do not have and such feature justifies a higher or lower standard'' than applies or will apply to the other products. (42 U.S.C. 6295(q)(1)) In determining whether a performance-related feature justifies such a different standard for a group of equipment, DOE must consider ''such factors as the utility to the consumer of such a feature'' and other factors DOE deems appropriate. *Id.* Any rule prescribing such a standard must include an explanation of the basis on which such higher or lower level was established. (42 U.S.C. 6295(q)(2))

Federal energy conservation requirements generally supersede State laws or regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297(a)–(c)) DOE can, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA found in 42 U.S.C. 6297(d). Specifically, States that regulate an energy conservation standard for a type of covered product for which there is a Federal energy conservation standard may petition the Secretary for a DOE rule that allows the State regulation to become effective with respect to such covered product. (42 U.S.C. 6297(d)(1)(A)) DOE must prescribe a rule granting the petition if the Secretary finds that the State has established by a preponderance of the evidence that its regulation is needed to meet ''unusual and compelling State or local energy * * * interests.'' (42 U.S.C. 6297(d)(1)(B))

C. Background

1. Current Standards

EPCA, as amended by EPACT 2005, prescribes energy conservation standards for CCWs manufactured on or after January 1, 2007. (42 U.S.C. 6313(e)) These standards require that CCWs have an MEF of at least 1.26 cubic feet of capacity (ft^3) per kilowatt-hour (kWh) and a WF of not more than 9.5 gallons of water (gal) per ft^3. (*Id.;* 10 CFR 431.156)

2. History of Standards Rulemaking

To initiate the current rulemaking to consider energy conservation standards, on March 15, 2006, DOE published on its Web site a document titled, *Rulemaking Framework for Commercial Clothes Washers and Residential Dishwashers, Dehumidifiers, and Cooking Products* (Framework Document).[5] 71 FR 15059 (March 27, 2006). The Framework Document described the procedural and analytical approaches that DOE anticipated using to evaluate energy conservation standards for these products, and identified various issues to be resolved in conducting the rulemaking. DOE held a public meeting on April 27, 2006, to present the Framework Document, to describe the analyses it planned to conduct during the rulemaking, to receive comments from interested parties, and to inform and facilitate interested parties' involvement in the rulemaking. DOE received 11 written comments in response to the Framework Document after the public meeting.

On December 4, 2006, DOE posted two spreadsheet tools for this rulemaking on its Web site.[6] The first tool calculates LCC and payback periods (PBPs) and included spreadsheets for: (1) Dishwashers; (2) dehumidifiers; (3) cooktops; (4) ovens; (5) microwave ovens; and (6) CCWs. The second tool—the national impact analysis (NIA) spreadsheets—calculate the impacts on shipments and the national energy savings (NES) and NPV at various candidate standard levels for: (1) Dishwashers; (2) dehumidifiers; (3) cooktops and ovens; (4) microwave ovens; and (5) CCWs.

DOE published the advance notice of proposed rulemaking (ANOPR) for this rulemaking on November 15, 2007 (November 2007 ANOPR) (72 FR 64432), and held a public meeting on December 13, 2007, to present and seek comment on the November 2007 ANOPR analytical methodology and results. The November 2007 ANOPR included background information on the history and conduct of this rulemaking. 72 FR 64432, 64438–39 (Nov. 15, 2007) In the November 2007 ANOPR, DOE described and sought further comment on the analytical framework, models, and tools (*e.g.,* LCC and NIA spreadsheets) it was using to analyze the impacts of energy conservation standards for these products. In conjunction with the November 2007 ANOPR, DOE also posted on its Web site the complete November 2007 ANOPR technical support document (TSD). The TSD included the results of a number of DOE's preliminary analyses, including: (1) The market and technology assessment; (2) screening analysis; (3) engineering analysis; (4) energy and water use determination; (5) markups analysis to determine equipment price; (6) LCC and PBP analyses; (7) shipments analysis; (8) NIA; and (9) manufacturer impact analysis (MIA). In the November 2007 ANOPR and at the public meeting, DOE invited comment in particular on the following issues concerning CCWs: (1) Product classes; (2) horizontal-axis designs; (3) technologies unable to be analyzed and exempted product classes, including potential limitations of existing test procedures; (4) per-cycle energy consumption; (5) consumer prices; (6) repair and maintenance costs; (7) efficiency distributions in the base case; (8) shipments forecasts; (9) base-case and standards-case forecasted efficiencies; and (10) TSLs. 72 FR 64432, 64512–14 (Nov. 15, 2007).

On October 17, 2008, DOE published a NOPR (October 2008 NOPR) in the **Federal Register**, in which it proposed amended energy conservation standards for certain products and equipment, including CCWs. 73 FR 62034. The energy conservation standards proposed in the October 2008 NOPR for CCWs are shown in Table II.1.

[5] This document is available on the DOE Web site at: *http://www1.eere.energy.gov/buildings/appliance_standards/commercial/clothes_washers.html.*

[6] These spreadsheets are available on the DOE Web site at: *http://www1.eere.energy.gov/buildings/appliance_standards.*

TABLE II.1—COMMERCIAL CLOTHES WASHER ENERGY CONSERVATION STANDARDS PROPOSED IN THE OCTOBER 2008 NOPR

Equipment	Modified energy factor, ft^3/kWh	Water factor, gal/ft^3
Top-loading CCWs	1.76	8.3
Front-loading CCWs	2.0	5.5

In the October 2008 NOPR, DOE described and sought further comment on the analytical framework, models, and tools (*e.g.,* LCC and NIA spreadsheets) it was using to analyze the impacts of energy conservation standards for this equipment. In conjunction with the October 2008 NOPR, DOE also posted on its Web site the complete technical support document (TSD), which along with the October 2008 NOPR, is available at *http://www1.eere.energy.gov/buildings/appliance_standards/.* The TSD included the results of a number of DOE's analyses, including: (1) The market and technology assessment; (2) screening analysis; (3) engineering analysis; (4) energy and water use determination; (5) markups analysis to determine equipment price; (6) LCC and PBP analyses; (7) shipments analysis; (8) NES and national impact analyses; and (9) MIA. In the October 2008 NOPR and at the public meeting held on November 13, 2008 (referred to as the ''November 2008 public meeting''), DOE invited comment in particular on the following issues concerning CCWs: (1) The efficiency levels; (2) DOE's determination of the maximum technologically feasible (max-tech) efficiency levels for top-loading and front-loading CCWs; (3) the magnitude of possible equipment class shifting to front-loading CCWs; (4) the analysis and data relevant to the price elasticity of demand for calculating the anticipated energy and water savings at different TSLs; (5) the analysis of consumer knowledge of the Federal ENERGY STAR program and its potential as a resource for increasing knowledge of the availability and benefits of energy efficient appliances in the home appliance consumer market; (6) discount rates other than 7 percent and 3 percent real to discount future emissions reductions; (7) data that might enable DOE to test for market failures or other specific problems for CCWs; and (8) the determination of anticipated environmental impacts of the standards proposed in the October 2008 NOPR, particularly with respect to the methods for valuing the expected CO_2 and NO_X emissions savings. 73 FR 62034, 62133 (Oct. 17, 2008).

The October 2008 NOPR also included background information, in addition to that set forth above, on the history and conduct of this rulemaking. 73 FR 62034, 62040–62041 (Oct. 17, 2008). DOE presented the methodologies and results for the October 2008 NOPR analyses at the November 2008 public meeting. Comments presented by interested parties during this meeting and submitted in response to the October 2008 NOPR concerning the accuracy of the stated max-tech CCW efficiency level led to a thorough investigation of CCW efficiencies and today's SNOPR. DOE subsequently tested the max-tech unit at an independent test facility, revised the max-tech level, updated the analysis, and is publishing the SNOPR to allow interested parties to comment on the revised efficiency level proposals.

DOE expects to issue a final rule in this rulemaking no later than January 1, 2010, as required by EPCA, as amended by EPACT 2005 (42 U.S.C. 6313(e)). Based on this schedule, the estimated effective date of any amended energy conservation standards for this equipment would be January 1, 2013, 3 years after the final rule is published in the **Federal Register.**

D. Test Procedures

EPCA directs DOE to use the same test procedures for CCWs as those established by DOE for residential clothes washers (RCWs). (42 U.S.C. 6314(a)(8)) 73 FR 62034, 62043–62044 (Oct. 17, 2008). While DOE believes commercial laundry practices likely differ from residential practices,[7] DOE concluded in the October 2008 NOPR that the existing clothes washer test procedure (at 10 CFR part 430, subpart B, appendix J1) adequately accounts for the efficiency rating of CCWs, and that DOE's methods for characterizing energy and water use in the October 2008 NOPR analyses adequately accounted for the consumer usage patterns specific to CCWs.

In response to the October 2008 NOPR, Alliance Laundry Systems (Alliance), GE Consumer & Industrial (GE), and AHAM agreed with DOE's conclusion that the DOE clothes washer test procedure is adequate for rating CCWs. (Alliance, Public Meeting Transcript, No. 40.5 at p. 22; Alliance, No. 45 at p. 1; GE, No. 48 at p. 4; AHAM, Public Meeting Transcript, No. 40.5 at pp. 26–27; AHAM, No. 47 at p.4)[8] DOE did not receive any comments objecting to the use of the DOE clothes washer test procedure for CCWs. Therefore DOE continues to consider the existing DOE test procedure adequate to measure energy and water consumption of CCWs.

E. Technological Feasibility

1. General

DOE considers a design option to be technologically feasible if it is in use by the respective industry or if research has progressed to the development of a working prototype. Therefore, in each standards rulemaking, DOE conducts a screening analysis, based on information it has gathered regarding existing technology options and prototype designs. In consultation with manufacturers, design engineers, and other interested parties, DOE develops a list of design options for consideration in the rulemaking. Once DOE has determined that a particular design option is technologically feasible, it further evaluates each design option in light of the following three additional criteria: (a) Practicability to manufacture, install, and service; (b) adverse impacts on product utility or availability; or (c) adverse impacts on health or safety. 10 CFR part 430, subpart C, appendix A, section 4(a)(3) and (4). All design options that pass these screening criteria are candidates for further assessment in the engineering and subsequent analyses in the NOPR (or SNOPR) stage.

DOE published a list of evaluated CCW technologies in the November 2007 ANOPR. 72 FR 64432, 64458 (Nov. 15, 2007). For the reasons described in

[7] CCWs are typically used more frequently and filled with a larger load than RCWs.

[8] A notation in the form ''Alliance, No. 45 at p. 1'' identifies a written comment (1) made by Alliance Laundry Systems (Alliance), (2) recorded in document number 45 that is filed in the docket of this rulemaking (Docket No. EE–2006–STD–0127), maintained in the Resource Room of the Building Technologies Program, and (3) which appears on page 1 of document number 45.

the November 2007 ANOPR and in chapter 4 of the SNOPR TSD, DOE is not considering the following design options, as they do not meet one or more of the screening criteria: bubble action, electrolytic disassociation of water, ozonated laundering, reduced thermal mass, suds saving, and ultrasonic washing. In this supplemental notice, DOE has not screened out any additional technology options that were retained in the October 2008 NOPR analyses. No comments were received objecting to the technology options which were screened out in the October 2008 NOPR. 73 FR 62034, 62052 (Oct. 17, 2008).

Therefore, DOE believes all of the efficiency levels evaluated in this notice, which are based upon the retained design options, are technologically feasible. For more detail on DOE's method for developing CCW technology options and the process for screening these options, refer to the chapters 3 and 4 of the SNOPR TSD.

2. Maximum Technologically Feasible Levels

When DOE considers an amended or new standard for a type (or class) of equipment such as front-loading or top-loading CCWs, it must ''determine the maximum improvement in energy efficiency or maximum reduction in energy use that is technologically feasible'' for such equipment. (42 U.S.C. 6295(p)(2) and 6316(a)) For the October 2008 NOPR, DOE determined the max-tech efficiency levels for front-loading and top-loading CCWs in the engineering analysis, based on published MEF and WF values of commercially available equipment. (See chapter 5 in the NOPR TSD.) In proposing these max-tech levels, DOE noted that some CCWs exceed the max-tech MEF or WF levels, but not both. For example, two front-loading models exceed the max-tech MEF—they are rated at 2.45 and 2.68 MEF, respectively, in the Consortium for Energy Efficiency (CEE) qualifying product list for its Commercial, Family-Sized Washer Initiative—but don't achieve a max-tech WF level—they are rated at 5.69 and 5.47 WF, respectively. In the California Energy Commission (CEC) equipment database for CCWs, DOE found one top-loading model that exceeds the max-tech WF—it is rated at 7.3 WF—but not the max-tech MEF level—it is rated at 1.32 WF. This model has been discontinued, as discussed in the November 2007 ANOPR and the October 2008 NOPR TSD. The max-tech efficiency levels proposed in the October 2008 NOPR were selected to represent the best available combinations of high MEF and low WF for each equipment class.

For the October 2008 NOPR, DOE proposed the max-tech levels shown in Table II.2. 73 FR 62034, 62036 (Oct. 17, 2008).

TABLE II.2—COMMERCIAL CLOTHES WASHER MAX-TECH EFFICIENCY LEVELS PROPOSED IN THE OCTOBER 2008 NOPR

Equipment class	Max-tech level	
	MEF, ft^3/kW	WF, gal/ft^3
Top-Loading CCWs ..	1.76	8.3
Front-Loading CCWs	2.35	4.4

According to the CEE database, three front-loading CCWs rated at the max-tech efficiency level are on the market in the United States. One model listed in the database which exceeds the max-tech level is rated at (2.84 MEF/3.68 WF), but DOE determined this CCW has yet to be sold in the United States. The front-loading max-tech level was based on a single model listed in the CEC database.

The max-tech top-loading CCW efficiency rating in the October 2008 NOPR was questioned by Alliance at the November 2008 NOPR meeting. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 90–92) In response, DOE contracted an independent testing laboratory to verify the performance ratings for the max-tech top-loading CCW. The laboratory results (based on a 3-unit sample) suggest that the unit achieves 1.63 MEF/8.4 WF. Based on this information, for the SNOPR analysis, DOE revised the max-tech top-loading CCW level downward to 1.60 MEF/8.5 WF, a level proposed in the October 2008 NOPR as a ''gap-fill'' level and one which DOE concludes is attainable by the max-tech CCW model. For more details on this selection of max-tech levels for the SNOPR, see section III.C.1 of today's supplemental notice.

In sum, Table II.3 lists the max-tech levels that DOE is proposing for today's SNOPR. Today's proposed front-loading max-tech level is the same as in the October 2008 NOPR, whereas today's proposed top-loading max-tech level has been revised based on the independent test results.

TABLE II.3—COMMERCIAL CLOTHES WASHER MAX-TECH EFFICIENCY LEVELS PROPOSED FOR THIS SNOPR

Equipment class	Max-tech level	
	MEF, ft^3/kW	WF, gal/ft^3
Top-Loading CCWs ..	1.60	8.5
Front-Loading CCWs	2.35	4.4

F. Energy Savings

1. Determination of Savings

DOE used its NIA spreadsheet tool to estimate energy savings from amended standards for CCWs. (Section III.E of today's supplemental notice and chapter 11 of the SNOPR TSD describe the NIA spreadsheet model.) DOE forecasted energy savings over the period of analysis (beginning in 2013, the year that amended standards would go into effect, and ending in 2043) for each TSL, relative to the base case, which represents the forecast of energy consumption in the absence of amended energy conservation standards. DOE quantified the energy savings attributable to amended energy conservation standards as the difference in energy consumption between the standards case and the base case. The base case represents the forecast of energy consumption in the absence of amended energy conservation standards. The base case considers market demand for more efficient equipment.

The NIA spreadsheet tool calculates the electricity savings in ''site energy'' expressed in kWh. Site energy is the energy directly consumed on location by an individual equipment. DOE reports national energy savings on an annual basis in terms of the aggregated source energy savings, which is the savings of energy that is used to generate and transmit the energy consumed at the site. To convert site energy to source energy, DOE derived conversion factors, which change with time, from the March 2009 release of the *AEO 2009.* (See TSD chapter 11 accompanying today's supplemental notice for further details.)

2. Significance of Savings

EPCA, as amended, prohibits DOE from adopting a standard for a product if that standard would not result in ''significant'' energy savings. (42 U.S.C. 6295(o)(3)(B)) While the Act does not define the term ''significant,'' the U.S. Court of Appeals for the District of Columbia, in *Natural Resources Defense Council* v. *Herrington,* 768 F.2d 1355,

1373 (D.C. Cir. 1985), indicated that Congress intended ''significant'' energy savings in this context to be savings that were not ''genuinely trivial.'' The energy savings for energy conservation standards at each of the TSLs considered in this rulemaking are nontrivial, and, therefore, DOE considers them ''significant'' within the meaning of 42 U.S.C. 6295(o)(3)(B).

G. Economic Justification

1. Specific Criteria

As noted earlier, EPCA provides seven factors to be evaluated in determining whether an energy conservation standard is economically justified. (42 U.S.C. 6295(o)(2)(B)). The following sections discuss how DOE has addressed each of those seven factors in this rulemaking.

a. Economic Impact on Manufacturers and Consumers

DOE uses an annual-cash-flow approach in determining the quantitative impacts of a new or amended standard on manufacturers. This includes both a short-term assessment, based on the cost and capital requirements during the period between the announcement of a regulation and the time when the regulation becomes effective, and a long-term assessment. The impacts analyzed include INPV (which values the industry on the basis of expected future cash flows), cash flows by year, changes in revenue and income, and other measures of impact, as appropriate. Second, DOE analyzes and reports the impacts on different types of manufacturers, with particular attention to impacts on small manufacturers. Third, DOE considers the impact of standards on domestic manufacturer employment, manufacturing capacity, plant closures, and loss of capital investment. DOE also takes into account cumulative impacts of different regulations on manufacturers. For more details on this analysis, see section III.G.

For commercial consumers, measures of economic impact include the changes in LCC and payback period for the equipment at each TSL. Under EPCA, the LCC is one of the seven factors to be considered in determining economic justification. (42 U.S.C. 6295(o)(2)(B)(i)(II)) It is discussed in detail in the section below.

b. Life-Cycle Costs

The LCC is the sum of the purchase price of equipment (including the installation) and the operating expense (including energy and maintenance expenditures), discounted over the lifetime of the equipment.

In this rulemaking, DOE calculated both LCC and LCC savings for various CCW efficiency levels. DOE established the variability and uncertainty in energy and water use by defining the uncertainty and variability in the use (cycles per day) of the equipment. The variability in energy and water pricing were characterized by regional differences in energy and water prices. To account for uncertainty and variability in other inputs, such as equipment lifetime and discount rate, DOE used a distribution of values with probabilities attached to each value. For each consumer with a CCW, DOE sampled the values of these inputs from the probability distributions. As a result, the analysis produced a range of LCCs. This approach permits DOE to identify the percentage of consumers achieving LCC savings or attaining certain payback values due to an increased energy conservation standard, in addition to the average LCC savings or average payback for that standard. DOE presents the LCC savings as a distribution, with a mean value and a range. In the analysis prepared for the October 2008 NOPR, DOE assumed that the consumer will purchase the equipment in 2012. For today's SNOPR, that assumption has been changed to 2013 due to the expected effective date of any amended standards. See section III.D for more details on the analysis.

c. Energy Savings

While significant conservation of energy is a separate statutory requirement for imposing an energy conservation standard, EPCA requires DOE, in determining the economic justification of a proposed standard, to consider the total projected energy savings that are expected to result directly from the standard. (42 U.S.C. 6295(o)(2)(B)(i)(III)) As in the October 2008 NOPR, DOE used the NIA spreadsheet results in its consideration of total projected savings expected to be directly attributable to the considered standard levels. See section III.E for more details on this analysis.

d. Lessening of Utility or Performance of Equipment

In establishing classes of equipment, DOE considered whether the evaluated design options would likely lessen the utility or performance of CCWs. (42 U.S.C. 6295(o)(2)(B)(i)(IV)) In the October 2008 NOPR, DOE determined that none of the considered TSLs would reduce the utility or performance of the equipment under consideration in the rulemaking. Specifically, the standards proposed in the October 2008 NOPR would maintain the consumer utility of washing clothes in a washer with either top or front access. 73 FR 62034, 62047 (Oct. 17, 2008). This conclusion remains the same for the proposed standards in today's SNOPR. As in the October 2008 NOPR, the efficiency levels considered in today's SNOPR for both equipment classes require no changes in equipment design or unusual installation requirements that could reduce the utility or performance of CCWs.

e. Impact of Any Lessening of Competition

EPCA directs DOE to consider any lessening of competition that is likely to result from standards. It directs the Attorney General to determine the impact, if any, of any lessening of competition likely to result from a proposed standard and to transmit such determination to the Secretary, not later than 60 days after the publication of a proposed rule, together with an analysis of the nature and extent of such impact. (42 U.S.C. 6295(o)(2)(B)(i)(V) and (B)(ii)). DOE received the Attorney General's determination dated December 16, 2008. It is discussed in section V.B.5 below, and is reprinted at the end of this SNOPR. Impacts on manufacturers are also discussed in section III.G below.

f. Need of the Nation To Conserve Energy

The non-monetary benefits of today's proposed standards are likely to be reflected in improvements to the security and reliability of the Nation's energy system–namely, reductions in the overall demand for energy will result in reduced costs for maintaining reliability of the Nation's electricity system. DOE conducts a utility impact analysis to estimate how standards may impact the Nation's needed power generation capacity. This analysis captures the effects of efficiency improvements on electricity consumption by the equipment which is the subject of this rulemaking.

Today's proposed standards also are likely to result in improvements to the environment. In quantifying these improvements, DOE has defined a range of primary energy conversion factors and associated emissions reductions based on the estimated level of power generation displaced by energy conservation standards. DOE reports the environmental effects from each TSL in an environmental assessment in chapter 16 of the SNOPR TSD. (42. U.S.C. 6295(o)(2)(B)(i)(VI) and 6316(a)) See section III.J for more details on this analysis.

g. Other Factors

The Secretary, in determining whether a standard is economically justified, may consider other factors that the Secretary deems to be relevant. (42 U.S.C. 6295(o)(2)(B)(i)(VII)) In considering amended standards for today's SNOPR, the Secretary found no relevant factors other than those identified elsewhere in today's SNOPR.

2. Rebuttable Presumption

As set forth under 42 U.S.C. 6295(o)(2)(B)(iii), there is a rebuttable presumption that an energy conservation standard is economically justified if the increased installed cost for equipment that meets the standard is less than three times the value of the first-year energy savings resulting from the standard (and water savings in the case of a water efficiency standard). DOE's LCC and PBP analyses generate values that calculate the payback period for consumers of equipment meeting potential energy conservation standards, which includes, but is not limited to, the 3-year payback period contemplated under the rebuttable presumption test discussed above. (See chapter 8 of the TSD that accompanies this notice.) However, DOE routinely conducts a full economic analysis that considers the full range of impacts, including those to the consumer, manufacturer, Nation, and environment, as required under 42 U.S.C. 6295(o)(2)(B)(i). The results of this analysis serve as the basis for DOE to definitively evaluate the economic justification for a potential standard level (thereby supporting or rebutting the results of any preliminary determination of economic justification). Section III.D.13 of today's supplemental notice addresses the rebuttable-presumption payback calculation.

III. Methodology and Revisions to the Analyses Employed in the October 2008 Proposed Rule

DOE used economic models to estimate the impacts of the TSLs used in weighing the benefits and burdens of amended standards for the equipment that is the subject of this rulemaking. Specifically, DOE developed the relationship between cost and efficiency for this equipment, and calculated the simple payback period for the purposes of addressing the rebuttable presumption that a standard with a payback period of less than 3 years is economically justified. The LCC spreadsheet calculates the consumer benefits and payback periods for amended energy conservation standards. The NIA spreadsheet provides shipments forecasts and then calculates NES and NPV impacts of potential amended energy conservation standards. DOE also assessed manufacturer impacts, largely through use of the Government Regulatory Impact Model (GRIM).

Additionally, DOE estimated the impacts of energy conservation standards due to equipment on utilities and the environment. DOE used a version of EIA's National Energy Modeling System (NEMS) for the utility and environmental analyses. The NEMS model simulates the energy economy of the United States and has been developed over several years by the EIA primarily for the purpose of preparing the *AEO.* The NEMS produces forecasts for the United States that are available in the public domain. The version of NEMS used for appliance standards analysis is called NEMS–BT and is primarily based on the *AEO 2009* April Release with minor modifications.[9] The NEMS–BT offers a sophisticated picture of the effect of standards, since it accounts for the interactions between the various energy supply and demand sectors and the economy as a whole.

A. Equipment Classes

In general, when evaluating and establishing energy conservation standards, DOE divides covered products or equipment into classes by the type of energy used, capacity, or other performance-related features that affect consumer utility and efficiency. (42 U.S.C. 6295(q); 6316(a)) Different energy conservation standards may apply to different equipment classes. *Id.*

In the October 2008 NOPR, DOE proposed separate equipment classes and accompanying standards for top-loading and front-loading CCWs with separate standards for each class. 73 FR 62034, 62036 (Oct. 17, 2008). Thus the October 2008 NOPR represented a change from the November 2007 ANOPR and from EPACT 2005 [10], which placed all CCWs into a single equipment class with a single energy efficiency and water efficiency standard. The October 2008 NOPR stated that DOE believes it has the authority to establish additional equipment classes within an equipment category, if warranted. DOE determined in the October 2008 NOPR that two equipment classes are warranted because an amended standard would set MEF for all CCWs at a level significantly higher than what the max-tech for top-loading machines can attain today, and effectively eliminate top-loading CCWs from the market. *Id.*

DOE explained the basis of its authority to establish separate classes, and noted that it had previously established and used classes for residential clothes washers (RCW) in previous rulemakings and had cited the likely elimination of one of these classes as one of several reasons for denying the California Energy Commission's (CEC) petition for waiver from Federal preemption of its RCW regulation. DOE then concluded that, ''Given the similarities in technologies and design and operating characteristics between RCWs and CCWs, * * * the axis of access must be accorded similar treatment in the context of the current CCW rulemaking.'' DOE also asserted that, ''If DOE were to propose an amended standard for CCWs under the statutory criteria set forth in EPCA based upon a single product class, the result would be a standard that would effectively eliminate top-loading CCW's from the market * * *;''

Alliance, GE, Whirlpool Corporation (Whirlpool), and AHAM supported the two equipment classes as proposed in the October 2008 NOPR. (Alliance, Public Meeting Transcript, No. 40.5 at p. 22; Alliance, No. 45 at p. 1; GE, Public Meeting Transcript, No. 40.5 at p. 31; GE, No. 48 at p. 4; Whirlpool, Public Meeting Transcript, No. 40.5 at p. 28; Whirlpool, No. 50 at pp. 2–3, AHAM, Public Meeting Transcript, No. 40.5 at p. 26; AHAM, No. 47 at p. 4)

ASAP, American Council for an Energy-Efficient Economy (ACEEE), American Rivers, Natural Resources Defense Council, Northeast Energy Efficiency Partnerships, Northwest Power and Conservation Council, Southern California Edison, Southern California Gas Company, and San Diego Gas and Electric Company, jointly, (the Joint Comment) and ASAP, individually, stated that they dispute DOE's conclusion that two equipment classes are required under the law to preserve the availability of top-loading machines. (Joint Comment, No. 44 at pp. 5–6; ASAP, Public Meeting Transcript, No. 40.5 at p. 33) EarthJustice (EJ) noted that a horizontal-axis CCW, like some horizontal-axis residential models, could be designed with top-loading access through a hatch. (EJ, Public Meeting Transcript, No. 40.5 at p. 26)

[9] The EIA approves the use of the name NEMS to describe only an *AEO* version of the model without any modification to code or data. Because the present analysis entails some minor code modifications and runs the model under various policy scenarios that deviate from *AEO* assumptions, the name NEMS–BT refers to the model as used here. (''BT'' stands for DOE's Building Technologies Program.) For more information on NEMS, refer to *The National Energy Modeling System: An Overview,* DOE/EIA–0581 (98) (Feb. 1998)(available at: *http://tonto.eia.doe.gov/FTPROOT/forecasting/058198.pdf*).

[10] 42 U.S.C. 6313(e); codified at 10 CFR 431.156.

The Joint Comment stated that the ability to load a CCW from the front is substantially the same as the ability to load from the top. (Joint Comment, No. 44 at appendix A, pp. 1–4) Thus, the unavailability of top-loading CCWs would have no effect on equipment utility.

In response to the EarthJustice, DOE examined the potential use of top-loading, horizontal-axis machines in the CCW market. While a top-loading horizontal-axis design can provide access similar to traditional vertical-axis clothes washers, the consumer utility of a top-loading, horizontal-axis clothes washer may not be sufficiently comparable to that of a top-loading, vertical-axis clothes washer, since users of top-loading horizontal-axis units must perform multiple actions to undo and re-secure the hatch every time they access the inside of the wash basket. DOE research suggests that the added complication in loading and unloading such a clothes washer appears to be more relevant in a shared laundry and laundromat setting and less relevant in an institutional setting due to consumer education issues. In any case, DOE knows of no top-loading, horizontal-axis machines in the U.S. market for CCWs.

As discussed in the October 2008 NOPR, DOE concluded that the method of ''loading'' clothes (*i.e.,* the axis of access) is a ''feature'' of RCWs within the meaning of 42 U.S.C. 6295(o)(4). Due to similarities in technologies and in design and operating characteristics between RCWs and CCWs, the axis of access may also be considered a feature in the context of this CCW rulemaking. Therefore, DOE tentatively concludes that top-loading, vertical-axis CCWs provide unique utility, and that, as determined in the October 2008 NOPR, axis of access is a feature pursuant to EPCA. Thus, DOE is retaining the two proposed equipment classes from the October 2008 NOPR in today's SNOPR.

DOE seeks comment as to whether the method of ''loading'' clothes washers, or any other characteristic commonly associated with traditional ''top-loading'' or ''front-loading'' clothes washers are ''features'' within the meaning of 42 U.S.C. 6295(o)(4) in EPCA and whether the availability of such feature(s) would likely be affected by eliminating the separate classes for these equipment types previously established by DOE. This is identified as Issue 1 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment.)

As noted above, in the October 2008 NOPR, DOE took the position that EPCA does not permit adoption of a standard that would eliminate top-loading CCWs because the method of loading is a ''feature.'' 73 FR 62034, 62049–50. Furthermore, in DOE's denial of the CEC's petition for waiver from Federal preemption (71 FR 78157 (December 28, 2006)) and the ensuing litigation, *California Energy Commission* v. *DOE,* Case. No. 07–71576 (9th Cir.), DOE took the position that it could not waive Federal preemption, in part because the proposed California regulation of residential clothes washer water usage would result in the unavailability of top-loading residential clothes washers in the California market, based on DOE's evaluation of the clothes washer market in 2006.

DOE is willing to reconsider its previous conclusions as part of this rulemaking. More specifically, DOE is soliciting public comments on whether one or more of the characteristics commonly associated with different types of clothes washers, such as method of loading, presence or absence of agitators, ability to interrupt cycles, and possibly others, provide consumer utility that should, under existing law, be recognized and protected by DOE through the maintenance or establishment of separate equipment classes. DOE also seeks comments as to whether, as a consequence of market and technology developments, it should maintain the same equipment classes for commercial clothes washers as it does for residential clothes washers.

DOE notes that, if warranted by the public comments received and its further consideration of this issue, it were to establish a single equipment class in setting standards for CCWs, DOE intends to give considerable weight to the potential adverse effects of a single equipment class efficiency standard on competition in the CCW market. That is, DOE does not intend to set a standard that would produce significant adverse impacts on competition in this market.

B. Technology Assessment

For the technology assessment in the October 2008 NOPR analyses, DOE considered all RCW and CCW technology options that it is aware are or have been incorporated into working prototypes or commercially available clothes washers at the time of the analysis. ASAP stated that DOE should give more serious consideration to innovations currently in production on the RCW market. (ASAP, Public Meeting Transcript, No. 40.5 at pp. 33–34) DOE did not receive information on specific technologies for RCWs that it did not consider. Further, DOE notes that it considered as design options many technologies that are found in both RCWs and CCWs. Of the technology options screened out, only suds saving [11] has appeared previously as a feature in commercially available RCWs. DOE research suggests that clothes washers incorporating a suds-saving feature have not been available on the market since 2005, and further DOE research suggests that suds saving would be impractical to install in a commercial setting for reasons such as space limitations, questionable energy savings, incompatibility with CCW usage patterns, and lack of consumer acceptance. Therefore, DOE concludes that suds-savings is an RCW feature that was appropriately screened out for the CCW SNOPR analysis.

In addition, DOE has gathered and analyzed data published by CEC, CEE, and the ENERGY STAR Program to provide an overview of the energy efficiency levels achieved in today's CCWs and RCWs. Certain information about technologies associated with high-efficiency clothes washers can be determined by evaluating the models in these databases. DOE found that all front-loading CCWs on the market today are more efficient than top-loading CCW models. No top-loading CCW listed in these databases has an MEF greater than 1.76, whereas the majority of front-loading CCWs are listed as having MEFs greater than 2.0. Similarly, no top-loading CCW is rated as having a WF below 8.0, whereas the majority of front-loading CCWs have rated WFs below 7.0. In contrast, DOE research suggests that the most efficient vertical-axis RCWs achieve efficiency levels comparable to some horizontal-axis CCWs on the market today.[12] High efficiency, vertical-axis platforms that do not employ an agitator have been sold into the RCW market for several

[11] A suds-saving feature allows water from one wash cycle to be reused in the next wash cycle. After agitation, sudsy wash water is pumped into a separate storage tub, remaining there until the next wash cycle. While the water is stored, soil settles to the bottom of the tub. During the next wash cycle, all but an inch of the water is pumped back into the washer tub for use again. Clothes washers with the suds-saving feature must be larger than typical clothes washers in order to accommodate the additional storage tub.

[12] Typically, vertical-axis clothes washers are accessed from the top (also known as ''top-loaders''), while horizontal-axis clothes washers are accessed from the front (also known as ''front-loaders''). However, a limited number of residential horizontal-axis clothes washers which are accessible from the top (using a hatch in the wash basket) are currently available, although DOE is unaware of any such CCWs on the market. For the purposes of this analysis, the terms ''vertical-axis'' and ''top-loading'' will be used interchangeably, as will the terms ''horizontal-axis'' and ''front-loading.'' Additionally, clothes washers that have a wash basket whose axis of rotation is tilted from horizontal are considered to be horizontal-axis machines.

years, but have yet to be released in a CCW form. DOE expects manufacturers will continue to introduce new features first in the higher-volume residential markets before transitioning them to commercial applications. At this time, however, DOE is not aware of such technologies being incorporated in either commercially available CCWs or working CCW prototypes, and therefore did not consider them in the SNOPR analyses.

Whirlpool stated that there are considerable differences between RCWs and CCWs, including, but not limited to heavier duty components and a smaller basket utilized in CCW's. According to Whirlpool, the smaller basket is required by CCW customers, and it is inherently more difficult to achieve high efficiency with smaller baskets. (Whirlpool, No. 50 at p. 3)

For these reasons, DOE believes it has adequately considered RCW technologies that may be applicable to CCWs in its technology assessment. See chapter 3 of the SNOPR TSD for more information on the technologies considered.

C. Engineering Analysis

The purpose of the engineering analysis is to characterize the relationship between the incremental manufacturing cost and efficiency improvements of CCWs. DOE used this cost-efficiency relationship as input to the PBP, LCC, and NES analyses.

To estimate incremental manufacturing costs, DOE has identified three basic methodologies: (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 incremental costs of moving to higher energy efficiency levels, without regard to the particular design option(s) 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 on costs for parts and material, labor, shipping/packaging, and investment for models that operate at particular efficiency levels. DOE conducted the engineering analysis for this rulemaking using the efficiency-level approach. For this analysis, DOE relied upon efficiency data published in multiple databases, including those published by CEC, CEE and ENERGY STAR, which were supplemented with limited laboratory testing, data gained through reverse-engineering analysis, and primary and secondary research.

1. Efficiency Levels

The efficiency levels for CCWs are defined by two factors normalized by wash basket volume—MEF and WF. These two variables are only directly related to each other via the average hot water usage by a clothes washer, as measured by the DOE test procedure. Other measured parameters affect only one variable or the other. For example, cold water consumption only affects the WF, while remaining moisture content (RMC) only affects the MEF. (See chapter 5 of the SNOPR TSD for further explanation.)

In the October 2008 NOPR, DOE proposed the following efficiency levels for CCWs.

TABLE III.1—COMMERCIAL CLOTHES WASHER EFFICIENCY LEVELS PROPOSED IN THE OCTOBER 2008 NOPR

Efficiency level	Modified energy factor (ft^3/kWh)/water factor (gal/ft^3)	
	Top-loading	Front-loading
Baseline	1.26/9.5	1.72/8.0
1	1.42/9.5	1.80/7.5
2	1.60/8.5	2.00/5.5
3	1.76/8.3	2.20/5.1
4	N/A	2.35/4.4

a. Revised Efficiency Levels

In response to the October 2008 NOPR, Alliance disputed DOE's finding that the proposed max-tech level for top-loading CCWs is technically feasible, based on Alliance's internal testing of one max-tech unit. Alliance stated that there were numerous inconsistencies related to the stated efficiencies of the max-tech top-loading CCW, the GE WNRD2050G, in databases such as those published by the CEC and ENERGY STAR. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 22–24 and 90–92) According to Alliance, its own tests for the same model did not achieve the published efficiency levels of 1.76 MEF/8.3 WF. Alliance suggested that DOE should test and confirm the max-tech model's efficiency before continuing to use it as the basis for the max-tech efficiency levels proposed in the October 2008 NOPR. (Alliance, No. 45 at Attachment 2, pp. 4–5)

GE responded in its written comments that there was indeed a transposition error, which led to the inconsistencies noted by Alliance. GE stated that the equipment label indicated an energy rating of 472 kWh per year, equaling 1.204 kWh per cycle, meaning that consumers were getting a more efficient product than the energy rating contained on the label. GE stated that it takes any labeling error very seriously, and corrected the issue immediately upon its discovery. (GE, No. 48 at pp. 4–5). DOE review of present and past ENERGY STAR databases for CCWs failed to find an entry for the WNRD2050G. Based on market research and the CEC addition of the unit in December 2007, it appears that the WNRD2050G was released into production in December 2007. Thus, because the model's stated WF (8.3) was above the cutoff for ENERGY STAR eligibility (8.0) at that time, DOE concludes that the WNRD2050G was never listed in the ENERGY STAR database for CCWs.

In response to comments about the validity of published CCW data, the DOE rulemaking team purchased three nominally identical max-tech top-loading CCWs, and hired an independent test facility to determine their average efficiency rating per the DOE test procedure.[13] The test results suggest that the max-tech CCW achieves a 1.63 MEF/8.4 WF efficiency rating instead of 1.76 MEF/8.3 WF as stated. Even at this lower max-tech level, the unit identified as the max-tech top-loading CCW model for the October 2008 NOPR continues to be the max-

[13] A minimum of three washers are required to be tested per the DOE test procedure (10 CFR 430 subpart B, appendix J1) to give test results some statistical certainty. If variability in the test results for the three washers is too high, an additional three units must be tested. For the DOE testing, no additional test units were required because the initial results had sufficiently low variability to be statistically valid.

tech top-loading CCW for the SNOPR analyses. However, as the tested values do not agree with the MEF and WF ratings in the CEC database on which the October 2008 NOPR analyses were based, and because this model was the only top-loading CCW stated to meet the (1.76 MEF/8.3 WF) max-tech level defined in the October 2008 NOPR, DOE elected to eliminate that efficiency level from the top-loading CCW analysis in the SNOPR.

Accordingly, DOE is proposing (1.60 MEF/8.5 WF) for today's max-tech level. Originally included based upon the CEE's Tier 2 qualifying criteria for CCWs effective between January 1, 2004, and January 1, 2007, 1.6 MEF/8.5 WF is an efficiency level for which DOE had previously solicited feedback from interested parties and which is also very close to the tested results for the max-tech CCW. The max-tech model uses many standard top-loader components and materials; hence, DOE research suggests that no CCW manufacturer would suffer material harm since they all should be able to produce top-loading machines that meet the max-tech efficiency level without technical difficulty.

ASAP stated that DOE should review current and upcoming ENERGY STAR efficiency levels for RCWs and subsequently revise efficiency levels under consideration for CCWs. ASAP noted that there are vertical-axis RCWs with agitators on the market that exceed the max-tech CCW level (*i.e.,* that impeller-type clothes washers are not necessary to exceed the current max-tech CCW efficiency level as implied by some manufacturers). (ASAP, Public Meeting Transcript, No. 40.5 at pp. 202–203) DOE is aware of the clothes washers referenced by ASAP and notes that they are only sold into the RCW market. Thus, it is not possible to assess whether these washers would be able to stand up to the rigors of operating in the CCW market. DOE research suggests that these washers are heavily patented, possibly preventing competitors such as the LVM from developing similar appliances. DOE research also suggests that some of the means by which these washers achieve their high efficiency levels (such as adaptive fill, a high number of wash programs, *etc.*) would yield few savings in a CCW setting, where washers are typically only washed with full loads and a limited number of wash programs are desired to limit consumer education needs. For these reasons, DOE did not consider these clothes washers in determining revised efficiency levels for the CCW analysis.

Thus, for today's SNOPR, DOE has proposed revised top-loading CCW efficiency levels shown in Table III.2, in which the max-tech top-loading level is now efficiency level 2 (1.60 MEF/8.5 WF). No changes have been made to the efficiency levels proposed in the October 2008 NOPR for front-loading CCWs in today's supplemental notice.

TABLE III.2—COMMERCIAL CLOTHES WASHER EFFICIENCY LEVELS PROPOSED FOR THIS SNOPR

Efficiency level	Modified energy factor (ft^3/kWh)/ water factor (gal/ft^3)	
	Top-loading	Front-loading
Baseline	1.26/9.5	1.72/8.0
1	1.42/9.5	1.80/7.5
2	1.60/8.5	2.00/5.5
3	N/A	2.20/5.1
4	N/A	2.35/4.4

DOE seeks comment on the revised efficiency levels for top-loading CCWs. This is identified as Issue 2 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment).

b. Technological Feasibility of the Revised Top-Loading Max-Tech Level

DOE also received numerous comments regarding the viability in commercial settings of the max-tech top-loading CCW evaluated in the October 2008 NOPR. Alliance and GE commented that the commercial acceptance of the technology behind the max-tech vertical-axis CCW is as yet unknown because the GE model was introduced only recently and because the max-tech unit is currently only sold into the on-premise laundry market segment, where the frequency of user abuse such as overloading is lower than in other commercial segments (laundromats, multi-family housing, *etc.*). (Alliance, Public Meeting Transcript, No. 40.5 at p. 23; GE, Public Meeting Transcript, No. 40.5 at pp. 173–174; GE, No. 48 at p.4;) Whirlpool suggested that the practice of overloading impairs top-loading CCWs more than front-loading machines, and, thus, inherently limits the efficiency levels that top-loading CCWs can achieve. Whirlpool also stated that CCWs are more prone to user abuse, such as extreme overloading, than RCWs. Whirlpool noted that certain residential platforms are not able to achieve proper clothes roll-over and, hence, cleaning when overfilled. (Whirlpool, No. 50 at pp. 2–3) The Joint Comment stated that on-premise laundry is served primarily by larger capacity equipment than is covered by this rulemaking. (Joint Comment, No. 44 at pp. 4–5) Conversely, Alliance stated that the max-tech vertical-axis CCW is based on a lightweight RCW platform that is poorly suited to commercial usage. (Alliance, No. 45 at Attachment 2, p. 7)

DOE recognizes that the max-tech top-loading CCW is currently marketed only to on-premise laundry facilities and is not yet offered with a coin-box or smart card reader option for laundromat or multi-housing laundry use. DOE research indicates that the max-tech CCW is based on a standard vertical-axis RCW platform (*i.e.,* one with an agitator) with selective upgrades, including spray rinse, four water-level settings, additional low-temperature wash programs, a low-standby power supply, and an electronic control board/user interface/drive system that is customized for its intended use. No proprietary technologies were observed, and, thus, DOE believes that all CCW manufacturers could market vertical-axis clothes washers with similar performance in time for the effective date of today's proposed rule. The unit shares many characteristics with CCWs from the same manufacturer marketed towards laundromat and multi-unit housing applications, including an industry-standard 25-minute wash cycle. In its teardown analysis, DOE observed that the max-tech top-loading CCW appears to be built with similar construction and components as similar CCW models marketed to commercial laundromats, which are also largely based on an existing RCW platform. Thus, DOE believes that the max-tech CCW is equally rugged and durable as

other units on the market. Further, DOE believes that applicable payment-system interfaces could be incorporated in time for the effective date of today's proposed standards.

DOE research also suggests that commercial acceptance depends on wash performance. Multiple comments from interested parties were received concerning wash performance of high-efficiency clothes washers. The Multi-Housing Laundry Association (MLA) and Alliance commented that the top-loading CCW standard proposed in the October 2008 NOPR could result in reduced equipment quality and clothes washing and rinsing performance. Alliance stated that the required reductions in water consumption and and/or low wash temperature to meet the standard proposed in the October 2008 NOPR would negatively affect consumer utility. Alliance stated that the max-tech vertical-axis CCW, when used with common clothes washing detergents, may not provide adequate clothes washing performance. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 23–24 and p. 202; Alliance No. 45 at p. 1 and Attachment 2, p. 14; MLA No. 49 at pp. 3–4) DOE recognizes that any amended energy efficiency standard could result in a lessening of certain equipment utility and hence interviews interested parties to better understand the potential impacts of energy efficiency strategies that manufacturers might employ in their equipment. Although interested parties have suggested that the max-tech model does not provide acceptable washing and rinsing performance targets, especially when overloaded, they have yet to submit evidence of such performance degradation. Furthermore, DOE is not aware of any widely accepted, quantitative measures associated with clothes washing performance. While DOE research uncovered a rinse-performance standard that was developed by Australian clothes washer manufacturers, this rinse test has yet to find acceptance in the U.S. market.

DOE also received comments on whether the max-tech vertical-axis efficiency level could be achieved by multiple CCW models. Alliance stated that it would be unwise to set a standard close to the max-tech level, since it could eliminate all but the max-tech model from the market. (Alliance, No. 45 at Attachment 2, p. 13) Alliance believes a properly functioning top-loading CCW market requires a range of models to serve all users. (Alliance, No. 45 at Attachment 2, p. 13) DOE notes that the MEF/WF combination for vertical-axis CCWs proposed in the October 2008 NOPR as TSL 2 and currently proposed in today's SNOPR as the max-tech level is not based on either the stated or the tested max-tech vertical-axis unit. Rather, the combination of MEF and WF proposed is set at a level slightly below the measured max-tech values, and is a level for which DOE had previously collected manufacturing, capital expenditure, product development, and other costs. For today's supplemental notice, DOE revised the max-tech level to the values at TSL 2 proposed in the October 2008 NOPR—1.60 MEF/8.5 WF—based on its independent testing. Compared to the top-loading max-tech level and proposed standard of 1.76 MEF/8.3 WF published in the October 2008 NOPR, the revised level is slightly less stringent (see section III.C.1 for a complete discussion of this change) and may allow manufacturers to field units with higher tested efficiencies in the future. For example, the max-tech unit may be revised to achieve its stated efficiency level. DOE believes that this revision of the proposed max-tech level for today's SNOPR should help alleviate some manufacturers' concerns regarding the technological feasibility and commercial acceptance of a max-tech top-loading CCW.

Alliance commented that front-loading CCWs with electric heaters have an MEF of 1.96, which would not meet the front-loading standards proposed in the October 2008 NOPR. According to Alliance, customers in some parts of the northern United States need such heaters to supplement their hot water supply in order to maintain proper wash temperatures despite very cold water supply temperatures. (Alliance, Public Meeting Transcript, No. 40.5 at p. 22) DOE has received no data on the extent or size of this impact or of the affected population. Hence, DOE invites comment, including population and efficiency impact data, to describe this issue.

DOE also invites further comment and information on the technological feasibility of the proposed max-tech CCW, including washing and rinsing performance measures for CCWs and population data for water heating CCWs. This is identified as Issue 3 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment).

2. Manufacturing Costs

In the October 2008 NOPR, DOE presented manufacturing cost estimates based on the November 2007 ANOPR analysis, revised in response to detailed CCW manufacturer feedback obtained at the NOPR stage for equipment at each efficiency level. 73 FR 62034, 62055–62056 (Oct. 17, 2008). These manufacturing costs were the basis of inputs for a number of other analyses in this rulemaking, including the LCC, national impact, and GRIM analyses.

As described in the October 2008 NOPR, DOE found that a low-volume manufacturer (LVM) operates in both the residential and CCW markets. DOE considers this manufacturer to be low-volume because its annual shipments in the combined RCW and CCW market are significantly lower than those of its larger competitors. However, unlike its larger rivals, most of the LVM's unit shipments are in the CCW market, where the LVM has significant market share. Also unlike its diversified competitors, this company exclusively manufactures laundry equipment. A review of the Securities and Exchange Commission (SEC) 10–K documents filed by the LVM revealed that, as of 2005, this company derived 22 percent of its total revenue from the sale of front- and top-loading clothes washers and 87 percent of that income was from the commercial market.[14] As a result, the LVM could be affected disproportionately by any rulemaking concerning CCWs compared to its competitors, for whom CCWs represent less than 2 percent of total clothes washer sales. Alliance stated that it is the LVM and that it has neither the purchasing power nor the funding to support wide-ranging research and development programs like those of its larger, more diverse rivals. (Alliance, No. 45 at Attachment 2, p. 8) As a result, the manufacturing costs for Alliance are inherently higher compared to those of its rivals. Alliance believes that the cost of compliance with the top-loading CCW standard proposed in the October 2008 NOPR would be especially high if Alliance were required to introduce non-traditional agitator designs to meet it. (Alliance, Public Meeting Transcript, No. 40.5 at p. 23 and p. 202) DOE research suggests that this efficiency level for vertical-axis clothes washers can be met with conventional, non-proprietary technology that is on the market today. Since the October 17, 2008 NOPR meeting, DOE has received no further comments on the manufacturing cost curves. Thus, for today's SNOPR, DOE has retained all cost estimates presented in the October 2008 NOPR at the retained efficiency levels, though each value was scaled by the Producer Price Index (PPI) multiplier for the commercial laundry equipment industry (NAICS 333312)

[14] SEC documents pertaining to the LVM are available online at: *http://sec.gov/cgi-bin/browse-idea?action=getcompany&CIK=0001063697&owner=exclude&count=40.*

between 2007 and 2008 to update the costs in the October 2008 NOPR to 2008$.[15] These are shown in Table III.3.

TABLE III.3—COMMERCIAL CLOTHES WASHER INCREMENTAL MANUFACTURING COSTS

Efficiency level	Modified energy factor (ft³/kWh)/water factor (gal/ft³)		Incremental cost	
	Top-loading	Front-loading	Top-loading	Front-loading
Baseline	1.26/9.5	1.72/8.0	$0.00	$0.00
1	1.42/9.5	1.80/7.5	77.60	0.00
2	1.60/8.5	2.00/5.5	134.99	14.21
3	N/A	2.20/5.1	N/A	39.34
4	N/A	2.35/4.4	N/A	66.16

D. Life-Cycle Cost and Payback Period Analysis

In response to the requirements of section 325(o)(2)(B)(i) of the Act, DOE conducted LCC and PBP analyses to evaluate the economic impacts of possible amended energy conservation standards for owners of CCWs. This section of the notice describes these analyses. DOE conducted the analysis using a spreadsheet model developed in Microsoft (MS) Excel for Windows 2007. (See the SNOPR TSD, chapter 8).

The LCC is the total consumer expense over the life of the equipment, including purchase and installation expense and operating costs (energy and water expenditures, repair costs, and maintenance costs). The PBP is the number of years it would take for the consumer to recover the increased costs of a higher-efficiency equipment through energy savings. To calculate the LCC, DOE discounted future operating costs to the time of purchase and summed them over the lifetime of the equipment. DOE measured the change in LCC and the change in PBP associated with a given efficiency level relative to a base case forecast of equipment efficiency. The base case forecast reflects the market in the absence of amended mandatory energy conservation standards. As part of the LCC and PBP analyses, DOE developed data that it used to establish equipment prices, installation costs, annual energy consumption, energy and water prices, maintenance and repair costs, equipment lifetime, and discount rates.

DOE was unable to develop a consumer sample for CCWs because EIA's *Commercial Building Energy Consumption Survey* (CBECS) does not provide the necessary data to develop one.[16] Instead, DOE established the variability and uncertainty in energy and water use by defining the uncertainty and variability in the use (cycles per day) of the equipment. The variability in energy and water pricing was characterized by regional differences in energy and water prices. DOE calculated the LCC associated with a baseline CCW. To calculate the LCC savings and PBP associated with equipment meeting higher efficiency standards, DOE substituted the baseline unit with a more efficient design.

Table III.4 summarizes the approaches and data DOE used to derive the inputs to the LCC and PBP calculations for the October 2008 NOPR, and the changes it made for today's SNOPR. DOE did not introduce changes to the LCC and PBP analyses methodology described in the October 2008 NOPR. However, as the following sections discuss in more detail, DOE revised some of the inputs to the analysis. Chapter 8 of the TSD accompanying this notice contains detailed discussion of the methodology utilized for the LCC and PBP analyses as well as the inputs developed for the analyses.

TABLE III.4—SUMMARY OF INPUTS AND KEY ASSUMPTIONS IN THE LCC AND PBP ANALYSES

Inputs	October 2008 NOPR	Changes for the SNOPR
Affecting Installed Costs:		
Equipment Price	Derived by multiplying manufacturer cost by manufacturer, distributor markups and sales tax.	Updated prices from 2006$ to 2008$.
Installation Cost	Baseline cost updated with RS Means *Mechanical Cost Data,* 2008.	Updated costs from 2006$ to 2008$.
Affecting Operating Costs:		
Annual Energy and Water Use.	Per-cycle energy and water use based on MEF and WF levels. Disaggregated into per-cycle machine, dryer, and water heating energy using data from DOE's 2000 TSD for residential clothes washers. Annual energy and water use determined from the annual usage (number of use cycles). Usage based on several studies including research sponsored by MLA[17] and the Coin Laundry Association[18] (CLA). Different use cycles determined for multi-family and laundromat equipment applications.	No change.

[15] PPI data is maintained by the Bureau of Labor Statistics and is available at http://*www.bls.gov/ppi/*.

[16] Available online at: *http://www.eia.doe.gov/emeu/cbecs/*.

TABLE III.4—SUMMARY OF INPUTS AND KEY ASSUMPTIONS IN THE LCC AND PBP ANALYSES—Continued

Inputs	October 2008 NOPR	Changes for the SNOPR
Energy and Water/ Wastewater Prices.	Electricity: Updated using EIA's 2006 Form 861 data .... Natural Gas: Updated using EIA's 2006 *Natural Gas Monthly*. Water/Wastewater: Updated using RFC/AWWA's 2006 *Water and Wastewater Survey*. Variability: Regional energy prices determined for 13 regions; regional water/wastewater price determined for four regions.	Electricity: Updated using EIA's 2007 Form 861 data. Natural Gas: Updated using EIA's 2007 *Natural Gas Monthly*. Water/Wastewater: No change. Variability: No change.
Energy and Water/ Wastewater Price Trends.	Energy: Forecasts updated with EIA's *AEO 2008* ..... Water/Wastewater: Linear extrapolation of 1970–2007 historical trends in national water price index.	Reference Case forecast updated with EIA's *AEO 2009* April Release. High-Growth and Low-Growth forecasts updated with EIA's *AEO 2009* March Release. Water/Wastewater Prices: Updated to include historical trend through 2008. For the four years after 2008, fixed the annual price to the value in 2008 to prevent a dip in the forecasted prices.
Repair and Maintenance Costs.	Estimated annualized repair costs for each efficiency level based on half the equipment lifetime divided by the equipment lifetime.	Updated costs from 2006$ to 2008$.
Affecting Present Value of Annual Operating Cost Savings		
Equipment Lifetime	Based on data from various sources including the CLA. Different lifetimes established for multi-family and laundromat equipment applications. Variability and uncertainty characterized with Weibull probability distributions.	No change.
Discount Rates	Approach based on cost of capital of publicly traded firms in the sectors that purchase CCWs. Primary data source is Damodaran Online[19].	No change.
Affecting Installed and Operating Costs:		
Effective Date of New Standard.	2012	2013.
Base-Case Efficiency Distributions.	Analyzed as two equipment classes: top-loading and front-loading. Distributions for both classes based on the number of available models at the efficiency levels. Top-Loading: 63.6% at 1.26 MEF/9.5 WF; 33.3% at 1.42 MEF/9.5 WF; 0% at 1.60 MEF/8.5 WF; 3.0% at 1.76 MEF/8.3 WF. Front-Loading: 7.4% at 1.72 MEF/8.0 WF; 4.4% at 1.80 MEF/7.5 WF; 85.3% at 2.00 MEF/5.5 WF; 1.5% at 2.20 MEF/5.1 WF; 1.5% at 2.35 MEF/4.4 WF.	Updated to reflect the most recent distributions on the number of available models at the efficiency levels. Top-Loading: 64.8% at 1.26 MEF/9.5 WF; 33.8% at 1.42 MEF/9.5 WF; 1.4% at 1.60 MEF/8.5 WF; 1.76 MEF/8.3 WF removed as Max Tech. Front-Loading: 3.5% at 1.72 MEF/8.0 WF; 0.0% at 1.80 MEF/7.5 WF; 73.7% at 2.00 MEF/5.5 WF; 22.8% at 2.20 MEF/5.1 WF; 0.0% at 2.35 MEF/4.4 WF.

1. Equipment Prices

To calculate the equipment prices faced by CCW purchasers, DOE multiplied the manufacturing costs developed from the engineering analysis by the supply chain markups it developed (along with sales taxes). DOE used the same supply chain markups for today's SNOPR that were developed for the October 2008 NOPR. See chapter 7 of the TSD accompanying this notice for additional information. To calculate the final installed prices, DOE added installation cost to the equipment prices.

2. Installation Cost

Installation costs include labor, overhead, and any miscellaneous materials and parts. For the October 2008 NOPR and today's SNOPR, DOE used data from the RS Means *Mechanical Cost Data,* 2008 on labor requirements to estimate installation costs for CCWs.[20] DOE estimates that installation costs do not increase with equipment efficiency.

3. Annual Energy Consumption

DOE determined the annual energy and water consumption of CCWs by multiplying the per-cycle energy and water use by the estimated number of cycles per year. In the October 2008 NOPR, DOE concluded that the use of the existing RCW test procedure provides a representative basis for rating and estimating the per-cycle energy use of CCWs. For today's SNOPR, DOE maintained the above approach.

4. Energy and Water Prices

a. Energy Prices

DOE derived average electricity and natural gas prices for 13 geographic areas consisting of the nine U.S. Census divisions, with four large States (New York, Florida, Texas, and California) treated separately.

DOE estimated commercial electricity prices for each of the 13 geographic areas based on data from EIA Form 861, *Annual Electric Power Industry Report.*[21] DOE calculated an average commercial electricity price by first estimating an average commercial price

[17] Please see the following Web site for further information: *http://www.mla-online.com/.*

[18] Please see the following Web site for further information: *http://www.coinlaundry.org/.*

[19] Please see the following Web site for further information: *http://pages.stern.nyu.edu/~adamodar/.*

[20] Available online at: *http://www.rsmeans.com/bookstore/.*

[21] Available online at: *http://www.eia.doe.gov/cneaf/electricity/page/eia861.html.*

for each utility, and then calculated a regional average price by weighting each utility with customers in a region by the number of commercial customers served in that region. The calculations for today's SNOPR used the most recent available data from 2007.

For the October 2008 NOPR, DOE estimated average commercial natural gas prices in each of the 13 geographic areas based on 2006 data from the EIA publication *Natural Gas Monthly.*[22] DOE calculated an average natural gas price for each area by first calculating the average prices for each State, and then calculating a regional price by weighting each State in a region by its population. For today's SNOPR, DOE used 2007 data from the same source.

To estimate the trends in electricity and natural gas prices for the October 2008 NOPR, DOE used the price forecasts in the *AEO 2008.*[23] To arrive at prices in future years, DOE multiplied the average prices described above by the forecast of annual average price changes in *AEO 2008.* For today's supplemental notice, DOE updated its energy price forecasts using those in the *AEO 2009* April Release. Because the *AEO* forecasts prices only to 2030, DOE followed past guidelines provided to the Federal Energy Management Program by EIA and used the average rate of change during 2020–2030 to estimate the price trends beyond 2030.

The spreadsheet tools used to conduct the LCC and PBP analysis allow users to select either the *AEO's* high-growth case or low-growth case price forecasts to estimate the sensitivity of the LCC and PBP to different energy price forecasts. The *AEO 2009* April Release provides only forecasts for the Reference Case. Therefore, for today's supplemental notice, DOE used the *AEO 2009* March Release high-growth case or low-growth forecasts to estimate high-growth and low-growth price trends.

DOE received comment regarding the inputs into the energy price forecasts. The Joint Comment recommended that DOE conduct a sensitivity analysis using a basket of other forecasts besides the *AEO.* (Joint Comment, No. 44 at p. 11) As mentioned above, DOE considered the *AEO's* high-growth case and low-growth case price forecasts to estimate the sensitivity of the LCC and PBP results to different energy price forecasts. The *AEO* alternative forecasts provide a suitable range to examine the sensitivity of LCC and PBP results to different energy price forecasts.

Interested parties also recommended DOE consider pending legislation that could influence future energy prices. The Joint Comment stated that to realistically depict energy prices in the future, DOE must consider the impact of carbon control legislation, since such legislation is very likely. It also noted that there are regional cap and trade programs that are in effect in the Northeast (Regional Greenhouse Gas Initiative (RGG)) and the West (Western Climate Initiative (WCI)) that will impact the price of electricity and are not reflected in the *AEO* energy price forecasts. (Joint Comment, No. 44 at p. 12) EJ stated that caps will likely be in place by the time new standards become effective, so DOE should increase its electricity prices to reflect the cost of complying with emission caps. (EJ, Public Meeting Transcript, No. 40.5 at pp. 105–106) The shape of Federal carbon control legislation, and the ensuing cost of carbon mitigation to electricity generators, is as yet too uncertain to incorporate into the energy price forecasts that DOE uses. The costs of carbon mitigation to electricity generators resulting from the regional programs are also very uncertain over the forecast period for this rulemaking. Even so, EIA did include the effect of the RGGI in its *AEO 2009* April Release energy price forecasts. (WCI did not provide sufficient detail to EIA in order for them to model the impact of the WCI on energy price forecasts.) Therefore, the energy price forecasts used in today's supplemental notice do include the impact of one of the two regional cap and trade programs in the United States.

b. Water and Wastewater Prices

DOE obtained commercial water and wastewater price data from the Water *and Wastewater Rate Survey* conducted by Raftelis Financial Consultants (RFC) and the American Water Works Association (AWWA). For the October 2008 NOPR and today's SNOPR, DOE used the 2006 *Water and Wastewater Rate Survey.*[24] The survey covers approximately 300 water utilities and 200 wastewater utilities, with each industry analyzed separately. DOE calculated values at the Census region level (Northeast, South, Midwest, and West). Edison Electric Institute (EEI) questioned why water and wastewater prices were not developed at the Census division level. (EEI, Public Meeting Transcript, No. 40.5, p. 103 and p. 178) The samples that DOE obtained of 200–300 utilities are not large enough to calculate regional prices for all U.S. Census divisions and large States. Hence, DOE was only able to capture the variability of water and wastewater prices at the Census region level.

To estimate the future trend for water and wastewater prices, DOE used data on the historic trend in the national water price index (U.S. city average) provided by the Bureau of Labor Statistics (BLS). For the October 2008 NOPR, DOE extrapolated a future trend based on the linear growth from 1970 to 2007. The Joint Comment stated that (1) the trend line for water and wastewater prices developed by DOE begins with an anomalous dip of over seven percent in costs for 2008, rather than the likely increase of 2 percent or more; and (2) DOE's trend forecast understates the future cost of water and wastewater service by some ten percent. (Joint Comment, No. 44 at pp. 3–4) For today's SNOPR, DOE modified its future trends of water and wastewater prices based on some of the Joint Comment's suggestions. DOE continued to the use the BLS historical data, which now provides data for the year 2008, and extrapolated the future trend based on the linear growth from 1970 to 2008. But rather than use the extrapolated trend to forecast the prices for the four years after 2008, DOE pinned the annual price to the value in 2008. Otherwise, forecasted prices for this 4-year time period would have been up to 8 percent lower than the price in 2008. Estimating prices in this manner is appropriate because it is consistent with the historical trend that demonstrates that prices do not decrease over time. Estimating prices in this manner also prevents the anomalous dip noted by the Joint Comment. Beyond the 4-year time period, DOE used the extrapolated trend to forecast prices out to the year 2043.

5. Repair and Maintenance Costs

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. For the October 2008 NOPR, DOE included increased repair costs based on an algorithm developed by DOE for central air conditioners and heat pumps and which was also used for residential furnaces and boilers.[25]

[22] Available online at: *http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_monthly/ngm.html.*

[23] All AEO publications are available online at: *http://www.eia.doe.gov/oiaf/aeo/.*

[24] Raftelis Financial Consultants, Inc., *2006 RFC/AWWA Water and Wastewater Rate Survey, 2006,* (2006). This document is available at: *http://www.raftelis.com/ratessurvey.html.*

[25] U.S. Department of Energy, Technical Support Document: Energy Efficiency Standards for Consumer Products: Residential Central Air Conditioners and Heat Pumps (May 2002) chapter 5. This document is available at: *http://*

Continued

This algorithm calculates annualized repair costs by dividing half of the equipment retail price over the equipment lifetime. Whirlpool agreed with the assumptions DOE used to estimate CCW repair costs in the October 2008 NOPR. (Whirlpool, No. 50 at p. 3) MLA stated that more efficient CCWs incur higher maintenance costs. (MLA, No. 49 at p. 4) ASAP asked whether DOE had gathered empirical data to estimate CCW repair and maintenance costs. (ASAP, Public Meeting Transcript, No. 40.5 at pp. 110–111) DOE was unable to gather any empirical data specific to CCWs to estimate repair and maintenance cost. In the absence of better data, DOE retained its approach from the October 2008 NOPR for today's SNOPR.

6. Equipment Lifetime

For the October 2008 NOPR and today's SNOPR, DOE used a variety of sources to establish low, average, and high estimates for equipment lifetime. The average CCW lifetime was 11.3 years for multi-family applications, and 7.1 years in laundromat applications. DOE characterized CCW lifetimes with Weibull probability distributions.

7. Discount Rates

To establish discount rates for CCWs for the October 2008 NOPR and today's SNOPR, DOE estimated the cost of capital of publicly traded firms in the sectors that purchase CCWs as the weighted average of the cost of equity financing and the cost of debt financing. DOE identified the following sectors purchasing CCWs: (1) Educational services; (2) hotels; (3) real estate investment trusts; and (4) personal services. DOE estimated the weighted-average cost of capital (WACC) using the respective shares of equity and debt financing for each sector that purchases CCWs. It calculated the real WACC by adjusting the cost of capital by the expected rate of inflation. To obtain an average discount rate value, DOE used additional data on the number of CCWs in use in various sectors. DOE estimated the average discount rate for companies that purchase CCWs at 5.7 percent. DOE received comment on the discount rates from Alliance, who suggested that the discount rates used in LCC and PBP analyses should be updated to reflect current financial market conditions. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 115–116) DOE used the most recent available data (from 2006) from Damodaran Online and Ibbotson Associates to estimate its discount rates for CCWs. Damodaran Online is a widely used source of information about company debt and equity financing for most types of firms. Ibbotson Associates is a leading authority on asset allocation with expertise in capital market expectations and portfolio implementation. DOE believes that the data it used are representative of conditions that may apply when the first purchases impacted by standards would be made. Therefore, DOE continued to use these sources for today's SNOPR and will determine if the data used from both sources needs to be updated for the final rule.

8. Effective Date of the Amended Standards

The compliance date is the future date when parties subject to the requirements of a new standard must begin compliance. For the October 2008 NOPR, DOE assumed that any new energy efficiency standards adopted in this rulemaking would require compliance in March 2012, 3 years after the final rule was expected to be published in the **Federal Register**. For today's SNOPR, DOE expects that the final rule will be published by January 1, 2010, as required by EPACT 2005, with compliance with new standards required by January 1, 2013. DOE calculated the LCC for the appliance consumers as if they would purchase new equipment in the year after the standard takes effect.

9. Equipment Energy Efficiency in the Base Case

For the LCC and PBP analysis, DOE analyzes higher efficiency levels relative to a baseline efficiency level. However, some consumers may already purchase equipment with efficiencies greater than the baseline equipment levels. Thus, to accurately estimate the percentage of consumers that would be affected by a particular standard level, DOE estimates the distribution of equipment efficiencies that consumers are expected to purchase under the base case (*i.e.,* the case without new energy efficiency standards). DOE refers to this distribution of equipment energy efficiencies as a base-case efficiency distribution. As discussed previously in section III.A, DOE decided to analyze CCWs with two equipment classes—top-loading CCWs and front-loading CCWs. For the October 2008 NOPR and today's SNOPR, DOE used the number of available models within each equipment class to establish the base-case efficiency distributions. Table III.5 presents the market shares of the efficiency levels in the base case for CCWs. See chapter 8 of the TSD accompanying this notice for further details on the development of CCW base-case market shares.

TABLE III.5—COMMERCIAL CLOTHES WASHERS: BASE CASE MARKET SHARES

Top-loading				Front-loading			
Standard level	MEF	WF	Market share (percent)	Standard level	MEF	WF	Market share (percent)
Baseline	1.26	9.50	64.8	Baseline	1.72	8.00	3.5
1	1.42	9.50	33.8	1	1.80	7.50	0.0
2	1.60	8.50	1.4	2	2.00	5.50	73.7
				3	2.20	5.10	22.8
				4	2.34	4.40	0.0

10. CCW Split Incentive

Under a split incentive situation, the party purchasing more efficient and presumably more expensive equipment (referred to as ''consumers'' in this notice) may not realize the operating cost savings from that equipment, because another party may pay the utility bill. For the October 2008 NOPR, DOE evaluated the ability of CCW owners to pass on the higher purchase costs of more expensive CCWs in return for lower operational costs. DOE concluded that few route operators

www.eere.energy.gov/buildings/appliance_standards/residential/ac_central_1000_r.html.

would allow themselves to be held to a lease agreement which would prevent them from recovering the cost of more efficient CCW equipment. The Joint Comment stated that contracts between route operators are multi-housing property owners are subject to revision and renewal, and that the division of coin-box revenue may be negotiated as a result of cost-effective efficiency improvements in CCWs. (Joint Comment, No. 44 at p. 6) Because DOE received only supportive comments regarding its assessment of the potential of a split incentive in the CCW market, DOE continues to conclude for today's SNOPR that new CCW efficiency standards are unlikely to lead to split incentives in the CCW market.

11. Rebound Effect

The rebound effect occurs when a piece of equipment, made more efficient and used more intensively, does not yield the expected energy savings from the efficiency improvement. In the case of more efficient clothes washers, limited research has been conducted to show that there is no rebound effect for home appliances, although the consumer may choose to purchase larger models with more features that would result in higher energy use.[26] DOE did not receive any comments from interested parties on the issue of the rebound effect for CCWs. Based on the limited research showing no rebound effect for home appliances, DOE did not include a rebound effect in its analysis of CCW standards.

12. Inputs to Payback Period Analysis

The PBP is the amount of time (expressed in years) it takes the consumer to recover the additional installed cost of more efficient equipment through operating cost savings, compared to baseline equipment. The simple PBP does not account for changes in operating expense over time or the time value of money. The inputs to the PBP calculation are the total installed cost of the equipment to the customer for each efficiency level and the annual (first-year) operating expenditures for each efficiency level. For the October 2008 NOPR and today's SNOPR, the PBP calculation uses the same inputs as the LCC analysis, except that energy price trends and discount rates are not needed.

13. Rebuttable-Presumption Payback Period

As noted above, EPCA, as amended (42 U.S.C. 6295(o)(2)(B)(iii) and 6316(a)), establishes a rebuttable presumption that a standard is economically justified if the Secretary finds that ''the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy (and as applicable, water) savings during the first year that the consumer will receive as a result of the standard,'' as calculated under the test procedure in place for that standard. For each TSL, DOE determined the value of the first year's energy savings by calculating the quantity of those savings in accordance with DOE's test procedure, and multiplying that amount by the average energy price forecast for the year in which a new standard would be first effective—in this case, 2013.

DOE received comments addressing the topic of using a rebuttable presumption payback period to establish the economic justification of an energy conservation standard level. The Joint Comment and EJ stated that DOE's view that consideration of a full range of impacts is necessary because the rebuttable presumption payback period criterion is not sufficient for determining economic justification does not reflect the extent to which the rebuttable presumption analysis constrains DOE's authority to reject standards based on economic impacts. (Joint Comment, No. 44 at appendix B, p. 1; EJ, Public Meeting Transcript, No. 40.5 at p. 130) The Joint Comment stated that in 42 U.S.C. 6295(o)(2)(B)(iii), Congress erected a significant barrier to DOE's rejection, on the basis of economic justifiability, of standard levels to which the rebuttable presumption applies. Further, EJ and the Joint Comment stated DOE preference to proceed under the seven-factor test contained in 42 U.S.C. 6295(o)(2)(B)(i) is not pertinent.

The Joint Comment agreed with DOE that analysis under the seven-factor test is necessary and has typically supported standards with paybacks longer than 3 years. However, the Joint Comment stated that DOE's decision-making must reflect the expressed intent of Congress that the highest standard level resulting in cost recovery within 3 years constitutes the presumptive lowest standard level that DOE must adopt. (Joint Comment, No. 44 at appendix B, pp. 1–2)

DOE does consider both the rebuttable presumption payback criteria, as well as a full analysis including all seven relevant statutory criteria under 42 U.S.C. 6295(o)(2)(B)(i) when examining potential standard levels. However, DOE believes that the interested parties are misinterpreting the statutory provision in question. The Joint Comment and EJ present one possible reading of an ambiguous provision (*i.e.,* that DOE need not look beyond the results of the rebuttable presumption inquiry), but DOE believes that such an approach is neither required nor appropriate, because it would ask the agency to potentially ignore other relevant information that would bear on the selection of the most stringent standard level that meets all applicable statutory criteria. The interested parties' interpretation would essentially restrict DOE from being able to rebut the findings of the preliminary presumptive analysis.

The statute contains no such restriction, and such an approach would hinder DOE's efforts to base its regulations on the best available information. Similarly, DOE believes that the Joint Comment misreads the statute in calling for a level that meets the rebuttable presumption test to serve as a minimum level when setting the final energy conservation standard. To do so would not only eliminate the ''rebuttable'' aspect of the presumption but would also lock in place a level that may not be economically justified based upon the full review of statutory criteria. DOE is already obligated under EPCA to select the most stringent standard level that meets the applicable statutory criteria, so there is no need to tie the same requirement to the rebuttable presumption.

E. National Impact Analysis—National Energy Savings and Net Present Value Analysis

1. General

DOE's NIA assesses the national energy savings, as well as the national NPV of total consumer costs and savings, expected to result from new standards at specific efficiency levels. DOE applied the NIA spreadsheet to perform calculations of energy savings and NPV, using the annual energy consumption and total installed cost data from the LCC analysis. DOE forecasted the energy savings, energy cost savings, equipment costs, and NPV for each equipment class from 2013 to 2043. The forecasts provide annual and cumulative values for all four parameters. In addition, DOE incorporated into its NIA spreadsheet the capability to analyze sensitivity of the results to forecasted energy prices

[26] L.A. Greening, D.L. Greene, and C. Difiglio. ''Energy efficiency and consumption—the rebound effect—a survey.'' *Energy Policy* 28 (2000) 389–401. Available for purchase at *http://www.elsevier.com/locate/enpol.*

and equipment efficiency trends. Table III.6 summarizes the approach and data DOE used to derive the inputs to the NES and NPV analyses for the October 2008 NOPR and the changes made in the analyses for today's SNOPR. A discussion of the inputs and the changes follows below. (See chapter 11 of the SNOPR TSD for further details.)

TABLE III.6—APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE NATIONAL ENERGY SAVINGS AND NPV ANALYSES

Inputs	2008 NOPR description	Changes for the SNOPR
Shipments	Annual shipments from Shipments Model	See Table III.7.
Effective Date of Standard	2012	2013.
Base-Case Forecasted Efficiencies.	Shipment-weighted efficiency (SWEF) determined in the year 2005. SWEF held constant over forecast period.	No change.
Standards-Case Forecasted Efficiencies.	Analyzed as two equipment classes. For each equipment class, roll-up scenario used for determining SWEF in the year that standards become effective for each standards case. SWEF held constant over forecast period.	No change.
Annual Energy Consumption per Unit.	Annual weighted-average values as a function of SWEF.	No change.
Total Installed Cost per Unit	Annual weighted-average values as a function of SWEF.	Updated costs from 2006$ to 2008$.
Energy and Water Cost per Unit.	Annual weighted-average values a function of the annual energy consumption per unit and energy (and water) prices.	Updated costs from 2006$ to 2008$.
Repair Cost and Maintenance Cost per Unit.	Incorporated changes in repair costs as a function of efficiency.	Updated costs from 2006$ to 2008$.
Escalation of Energy and Water/Wastewater Prices.	Energy Prices: *AEO 2008* forecasts (to 2030) extrapolation to 2042. Water/Wastewater Prices: Linear extrapolation of 1970–2007 historical trends in national water price index.	Energy Prices: Updated to *AEO 2009* April Release forecasts for the Reference Case. *AEO 2009* April Release does not provide High-Growth and Low-Growth forecasts; used *AEO 2009* March Release High-Growth and Low-Growth forecasts to estimate high and low growth price trends. Water/Wastewater Prices: Updated to include historical trend through 2008. For the four years following 2013 fixed the annual price to the value in 2008 to prevent a dip in the forecasted prices.
Energy Site-to-Source Conversion.	Conversion varies yearly and is generated by DOE/EIA's NEMS program (a time-series conversion factor; includes electric generation, transmission, and distribution losses).	No change.
Effect of Standards on Energy Prices.	Determined but found not to be significant	No change.
Discount Rate	Three and seven percent real	No change.
Present Year	Future expenses discounted to year 2007	Future expenses discounted to year 2009.

2. Shipments

The shipments portion of the NIA Spreadsheet is a Shipments Model that uses historical data as a basis for projecting future shipments of the equipment that are the subject of this rulemaking. In projecting CCW shipments, DOE accounted for three market segments: (1) New construction; (2) existing buildings (*i.e.,* replacing failed equipment); and (3) retired units not replaced. DOE used the non-replacement market segment to calibrate the Shipments Model to historical shipments data. For purposes of estimating the impacts of prospective standards on equipment shipments (*i.e.,* forecasting standards-case shipments) DOE considered the combined effects of changes in purchase price, annual operating cost, and household income on the magnitude of shipments.

Table III.7 summarizes the approach and data DOE used to derive the inputs to the shipments analysis for the October 2008 NOPR, and the changes it made for today's SNOPR. The general approach for forecasting CCW shipments for today's SNOPR remains unchanged from the October 2008 NOPR. That is, all CCW shipments (for both equipment classes) were estimated for the new construction, replacement and non-replacement markets. DOE then allocated shipments to each of the two equipment classes based on the market share of each class. Based on data provided by AHAM for the November 2007 ANOPR, DOE estimated that top-loading washers comprise 80 percent of the market while front-loading washers comprise 20 percent. DOE estimated that the equipment class market shares would remain unchanged over the time period 2005–2042. A discussion of the inputs and the changes follows below.

The Joint Comment suggested that DOE update its equipment class market shares to reflect the impacts of the 2006 Federal tax incentives for CCWs. (Joint Comment, No. 44 at p. 5) The Joint Comment noted that the increased production of front-loading washers in the base-case would in turn lead to lower conversion costs for manufacturers and, therefore, make it less costly to meet higher CCW efficiency standards. For today's supplemental notice, DOE reviewed the SEC 10K report of the LVM of CCWs and determined that manufacturer tax credits in recent Federal legislation have resulted in significantly increased sales of the front-loading washers for the LVM. When accounting for the LVM's market share, the increase in front-loading sales results in a current market share of 30 percent for front-loading washers. Although tax credits are set to expire after 2010, DOE believes that the

tax credits are impacting production costs and manufacturing infrastructure such that front-loading washers would continue to comprise 30 percent of the market over the entire forecast period.

Table III.7 below shows the inputs chosen for the Shipments Analysis in today's supplemental notice.

TABLE III.7 APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE SHIPMENTS ANALYSIS

Inputs	October 2008 NOPR description	Changes for the SNOPR
Number of Equipment Classes.	Two equipment classes: top-loading washers and front-loading washers. Shipments forecasts established for all CCWs and then disaggregated into the two equipment classes based on the market share of top- and front-loading washers. Market share data provided by AHAM; 80% top-loading and 20% frontloading. Equipment class market shares held constant over forecast period.	Updated, market share data based on SEC 10K report of the LVM and tax credits claimed by the LVM for producing high-efficiency CCWs. Market share determined to be: 70% top-loading and 30% front-loading. Equipment class market shares held constant over forecast period.
New Construction Shipments	Determined by multiplying multi-housing forecasts by forecasted saturation of CCWs for new multi-housing. Multi-housing forecasts with *AEO 2008* projections. Verified frozen saturations with data from the U.S. Census Bureau's *American Housing Survey* (AHS) for 1997–2005.	No change in approach. Housing forecasts updated with EIA *AEO 2009* April Release forecasts for the Reference Case. *AEO 2009* March Release forecasts used for the High-Growth Case and Low-Growth Case.
Replacements	Determined by tracking total equipment stock by vintage and establishing the failure of the stock using retirement functions from the LCC and PBP analysis. Retirement functions revised to be based on Weibull lifetime distributions.	No change.
Retired Units not Replaced (*i.e.,* non-replacements).	Used to calibrate Shipments Model to historical shipments data. Froze the percentage of non-replacements at 15 percent for the period 2007–2042 to account for the increased saturation rate of in-unit washers in the multi-family stock between 1997 and 2005 timeframe shown by the AHS.	Extended the time period out to 2043 to reflect an updated date of 2013 for when the standard becomes effective.
Historical Shipments	Data sources include AHAM data submittal, *Appliance Magazine,* and U.S. Bureau of Economic Analysis' quantity index data for commercial laundry.	No change.
Purchase Price, Operating Cost, and Household Income Impacts due to efficiency standards.	Developed the ''relative price'' elasticity which accounts for the purchase price and the present value of operating cost savings divided by household income. Used purchase price and efficiency data specific to residential refrigerators, clothes washers, and dishwashers between 1980 and 2002 to determine a ''relative price'' elasticity of demand, of −0.34.	No change.
Fuel Switching	Not applicable	No change.

DOE based its Shipments Model on the following three assumptions: (1) All equipment shipments for new construction are driven by the new multi-family housing market, (2) the relative market shares of the two equipment applications, laundromats and common-area laundry facilities in multi-family housing, are constant over time at 15 and 85 percent, respectively, and (3) the U.S. Census Bureau's quantity index data can be used to validate the shipments trend observed in the historical data. The Joint Comment stated that DOE's assumed 85 percent to 15 percent split between sales for multi-family applications and sales for laundromat applications is not based on robust or current data. (Joint Comment, No. 44 at p. 5) It cited information from Alliance Laundry that suggests that the ratio of multi-family to laundromat shipments is about 36 percent to 64 percent. DOE based its market information on a report from the CEE,[27] which gathered information from several sources. Therefore, DOE concluded that this source is more reliable than information from a single manufacturer, and it continued to apply the same multi-family/laundromat sales split used in the October 2008 NOPR for today's SNOPR.

DOE received comments regarding the impacts of impending amended energy conservation standards for CCWs on unit sales. Alliance suggested that impacts to the CCW market would encourage customers to stock up on less efficient top-loading CCWs before the implementation date, and keep older machines in operation longer. These effects would undermine the effectiveness of the standards proposed in the October 2008 NOPR. (Alliance, No. 45 at Attachment 2, p. 10) As discussed below in section III.E.2.c, DOE's shipments model uses a ''relative'' purchase price elasticity to determine the drop in shipments as a function of increased purchase price and operating cost savings. The model does forecast a drop in new shipments due to a high standard on top-loading CCWs, which is expected to result in purchase of used CCWs. DOE did not have sufficient information to account for possible stocking up on less efficient top-loading CCWs before the implementation date.

a. New Construction Shipments

To determine new construction shipments, DOE used a forecast of new housing coupled with equipment market saturation data for new housing. For new housing completions and mobile home placements, DOE adopted the projections from EIA's *AEO 2008* through 2030 for the October 2008 NOPR. For today's SNOPR, DOE used the projections from EIA's *AEO 2009*

[27] Consortium for Energy Efficiency, *Commercial Family-Sized Washers: An Initiative Description of the Consortium for Energy Efficiency* (1998). This document is available at: *http://www.cee1.org/com/cwsh/cwsh-main.php3.*

April Release Reference Case. For CCWs, DOE relied on new construction market saturation data from the above-mentioned CEE report.

b. Replacements and Non-Replacements

DOE estimated replacements using equipment retirement functions developed from equipment lifetimes. For the October 2008 NOPR and today's SNOPR, DOE used retirement functions based on Weibull distributions. For the October 2008 NOPR, DOE determined that the growth of in-unit washer saturations in the multi-family stock over the last 10 years was likely caused by conversions of rental property to condominiums, resulting in the gradual phase-out or non-replacement of failed CCWs in common-area laundry facilities. As a result, DOE used the average percent of non-replacements over the period between 1999 and 2005 (18 percent) and maintained it over the entire forecast period (2006 to 2042 for the October 2008 NOPR and 2007 to 2043 for today's SNOPR). The effect of maintaining non-replacements at 18 percent results in forecasted CCW shipments staying relatively flat during the forecast period.

Multiple interested parties commented on the shipment forecasts used by DOE in the October 2008 NOPR. Alliance agreed with the relatively flat shipment forecast. (Alliance, Public Meeting Transcript, No. 40.5 at p. 22; Alliance, No. 45 at p. 1) AHAM and Whirlpool stated that the October 2008 NOPR estimates of future shipments for CCWs were much more realistic than those used in the November 2007 ANOPR. (AHAM, Public Meeting Transcript, No. 40.5 at p. 27; AHAM, No. 47 at p. 4; Whirlpool, Public Meeting Transcript, No 40.5 at p. 28; Whirlpool, No. 50 at p. 3) The Joint Comment questioned DOE's forecast of reduced shipments for new and replacement CCWs, citing Alliance's SEC filing which projected ''modest growth'' in the installed base of commercial laundry equipment, estimated by Alliance to have grown at 0.9 percent annually since 1997. (Joint Comment, No. 44 at p. 5) DOE believes that the information it used to forecast CCW shipments for the October 2008 NOPR is more reliable than the limited information provided by the Joint Comment on one manufacturer's statement in a single SEC filing; thus DOE maintained the approach used in the October 2008 NOPR for today's SNOPR.

c. Purchase Price, Operating Cost, and Income Impacts

To estimate the combined effects on CCW shipments from increases in equipment purchase price and decreases in equipment operating costs due to amended efficiency standards, DOE conducted a literature review and a statistical analysis on a limited set of appliance price, efficiency, and shipments data for the October 2008 NOPR. DOE used purchase price and efficiency data specific to residential refrigerators, clothes washers, and dishwashers between 1980 and 2002 to conduct regression analyses. DOE's analysis suggests that the ''relative'' short-run price elasticity of demand, averaged over the three appliances, is −0.34. Because DOE's forecast of shipments and national impacts due to standards spans over 30 years, DOE also considered how the relative price elasticity is affected once a new standard takes effect. Past analyses of consumer purchase decisions for automobiles suggest that after the initial purchase price change, price elasticity becomes more inelastic over the years until it reaches a terminal value. See appendix 10A of the SNOPR TSD for more details on the development of the short-run price elasticity of demand and the long-run effects on the elasticity.

For the October 2008 NOPR, DOE incorporated a relative price elasticity change that resulted in a terminal value of approximately one-third of the short-run elasticity. In other words, DOE estimated that consumer purchase decisions, in time, become less sensitive to the initial change in the equipment's relative price. MLA commented that if the standards result in a substantial increase in the use of front-loading CCWs and a reduction or elimination in that of top-loading CCWs, consumers would see resulting price increases driven by higher purchase price and higher maintenance, service, and operating cost for front-loading CCWs compared to top-loaders. (MLA, No. 49 at pp. 3–4) In addition, ASAP questioned DOE's conclusion that standards more aggressive than the ones proposed in the October 2008 NOPR for front-loading CCWs could lead to significant recapture of the CCW market by top-loading machines. (ASAP, Public Meeting Transcript, No. 40.5 at pp. 34–35 and pp. 160–161) For its October 2008 NOPR as well as today's SNOPR, DOE estimated that price increases would lead to reductions in unit shipments for both top-loading and front-loading CCWs. DOE analyzed the impacts of increased purchase prices for each equipment class independently of the other. DOE was not able to estimate the cross price elasticity of demand between the two equipment classes to determine whether consumers would switch from one type of CCW to the other. But because the price impacts for more efficient top-loaders are higher than those for more efficient front-loaders, DOE estimated that top-loading CCW sales would decrease more rapidly than for front-loaders. As a result, DOE estimated that front-loading CCWs would gain an additional market share of only about 2 percent. In addition, DOE estimated that those consumers forgoing the purchase of new top-loading CCWs would instead purchase used top-loading CCWs with efficiencies equal to baseline top-loader levels. DOE received no additional comments on its analysis to estimate the combined effects of increases in equipment purchase price and decreases in operating costs on CCW shipments and, therefore, retained the approach for today's SNOPR.

Although DOE retained its approach from the October 2008 NOPR to estimate the impacts from changes in purchase price and operating cost, DOE has concerns over specific aspects of its analysis. First, because purchase price and efficiency data for residential appliances were used to develop the ''relative'' short-run price elasticity of demand, DOE is uncertain how applicable the price elasticity is to the commercial clothes washing market. Second, because estimates of the long-run price elasticity of demand were derived from consumer automobile purchase decisions, DOE is uncertain whether it can be inferred that the initial CCW price elasticity of demand would become more inelastic over time. Third, although a cross price elasticity of demand between top-loading and front-loading CCWs could not be developed due to the lack of specific data, DOE still has concern over the price interactions between the two types of CCWs, especially under those circumstances where the purchase price increase for one CCW equipment class is more significant than for the other. Finally, DOE is concerned over its assumption that consumers forgoing a top-loader CCW purchase due to a price increase caused by standards would instead acquire used top-loading washers. For example, those consumers forgoing a top-loading CCW purchase may instead purchase a new front-loading CCW. To understand the interactions between the used CCW market and the new front-loading CCW market, the development of a cross price

elasticity between these two markets would be ideal.

Due to the lack of data and information to develop both short- and long-run price elasticities of demand specific to CCWs as well as cross price elasticities between top-loading and front-loading CCWs and used and front-loading CCWs, DOE is seeking input and any data from interested parties that may assist in the development of price elasiticies specific to any or all of the items discussed above. This is identified as Issue 4 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment).

3. Other Inputs

a. Base-Case Forecasted Efficiencies

A key input to the calculations of NES and NPV are the energy efficiencies that DOE forecasts for the base case (without new standards). The forecasted efficiencies represent the annual shipment-weighted energy efficiency (SWEF) of the equipment under consideration over the forecast period (*i.e.,* from the estimated effective date of a new standard to 30 years after that date).

For the October 2008 NOPR, DOE first determined the distribution of equipment efficiencies currently in the marketplace to develop a SWEF for each equipment class for 2005. Using the SWEF as a starting point, DOE developed base-case efficiencies based on estimates of future efficiency increase. From 2005 to 2013 (2013 being the estimated effective date of a new standard), DOE estimated that there would be no change in the SWEF (*i.e.,* no change in the distribution of equipment efficiencies). Because there are no historical data to indicate how equipment efficiencies have changed over time, DOE estimated that forecasted efficiencies would remain at the 2013 level until the end of the forecast period. DOE recognizes the possibility that equipment efficiencies may change over time (*e.g.,* due to voluntary efficiency programs such as ENERGY STAR). But without historical information, DOE had no basis for estimating how much the equipment efficiencies may change. For today's supplemental notice, DOE maintained its estimate that the SWEF would remain constant from 2005 through the end of the forecast period.

b. Standards-Case Forecasted Efficiencies

For its determination of each of the cases with alternative standard levels (''standards cases''), DOE used a ''roll-up'' scenario in the October 2008 NOPR to establish the SWEF for 2013. In a roll-up scenario, equipment efficiencies in the base case which do not meet the standard level under consideration are projected to roll-up to meet the new standard level. Further, all equipment efficiencies in the base case that are above the standard level under consideration are not affected by the standard. The same scenario is used for the forecasted standards-case efficiencies as for the base-case efficiencies, namely, that forecasted efficiencies remained at the 2013 efficiency level until the end of the forecast period, as DOE has no data to reasonably estimate how such efficiency levels might change over the next 30 years. By maintaining the same rate of increase for forecasted efficiencies in the standards case as in the base case (*i.e.,* no change), DOE retained a constant efficiency difference between the two cases over the forecast period. Although the no-change trends may not reflect what would happen to base-case and standards-case equipment efficiencies in the future, DOE believes that maintaining a constant efficiency difference between the base case and standards case provides a reasonable estimate of the impact that standards have on equipment efficiency. It is more important to accurately estimate the efficiency difference between the standards case and base case, than to accurately estimate the actual equipment efficiencies in the standards and base cases. DOE retained the approach used in the October 2008 NOPR for today's SNOPR. But because the effective date of the standard is now assumed to be 2013, DOE applied the ''roll-up'' scenario in the year 2013 to establish the SWEF for each of the standards cases.

c. Annual Energy Consumption

The annual energy consumption per unit depends directly on equipment efficiency. For the October 2008 NOPR and today's SNOPR, DOE used the SWEFs associated with the base case and each standards case, in combination with the annual energy data, to estimate the shipment-weighted average annual per-unit energy consumption under the base case and standards cases. The national energy consumption is the product of the annual energy consumption per unit and the number of units of each vintage, which depends on shipments.

As noted above in section III.D, DOE used a relative price elasticity to estimate standards-case shipments for CCWs. As a result, shipments forecasted under the standards cases are lower than under the base case. To avoid the inclusion of energy savings from reduced shipments, DOE used the standards-case shipments projection and the standards-case stock to calculate the annual energy consumption in the base case. For CCWs, any drop in shipments caused by standards is estimated to result in the purchase of used machines. As a result, the standards-case forecast explicitly accounted for the energy and water consumption of new standard-compliant CCWs and also used machines coming into the market due to the drop in new equipment shipments.

DOE retained the use of the base-case shipments to determine the annual energy consumption in the base case and the approach used in the October 2008 NOPR for today's SNOPR.

d. Site-to-Source Conversion

To estimate the national energy savings expected from appliance standards, DOE uses a multiplicative factor to convert site energy consumption (energy use at the location where the appliance is operated) into primary or source energy consumption (the energy required to deliver the site energy). For the October 2008 NOPR, DOE used annual site-to-source conversion factors based on the version of NEMS that corresponds to *AEO 2008.* For today's SNOPR, DOE updated these conversion factors based on the *AEO 2009* March Release version of NEMS. These conversion factors account for natural gas losses from pipeline leakage and natural gas used for pumping energy and transportation fuel. For electricity, the conversion factors vary over time due to projected changes in generation sources (*i.e.,* the power plant types projected to provide electricity to the country). Since the *AEO* does not provide energy forecasts that go beyond 2030, DOE used conversion factors that remain constant at the 2030 values throughout the remainder of the forecast.

In response to a request from the DOE, Office of Energy Efficiency and Renewable Energy (EERE), the National Research Council (NRC) appointed a committee on ''Point-of-Use and Full-Fuel-Cycle Measurement Approaches to Energy Efficiency Standards'' to conduct a study called for in Section 1802 of EPACT 2005.[28] The fundamental task before the committee was to evaluate the methodology used for setting energy

[28] The National Academies, Board on Energy and Environmental Systems, Letter to Dr. John Mizroch, Acting Assistant Secretary, U.S. DOE, Office of EERE from James W. Dally, Chair, Committee on Point-of-Use and Full-Fuel-Cycle Measurement Approaches to Energy Efficiency Standards, May 15, 2009.

efficiency standards and to comment on whether site (point-of-use) or source (full-fuel-cycle) measures of energy efficiency better support rulemaking to achieve energy conservation goals. The NRC committee defined site (point-of-use) energy consumption as reflecting the use of electricity, natural gas, propane, and/or fuel oil by an appliance at the site where the appliance is operated, based on specified test procedures. Full-fuel-cycle energy consumption was defined as including, in addition to site energy use, the energy consumed in the extraction, processing, and transport of primary fuels such as coal, oil, and natural gas; energy losses in thermal combustion in power-generation plants; and energy losses in transmission and distribution to homes and commercial buildings.

In evaluating the merits of using point-of-use and full-fuel-cycle measures, the NRC committee noted that DOE uses what the committee referred to as ''extended site'' energy consumption to assess the impact of energy use on the economy, energy security, and environmental quality. The extended site measure of energy consumption includes the generation, transmission, and distribution but, unlike the full-fuel-cycle measure, does not include the energy consumed in extracting, processing, and transporting primary fuels. A majority of members on the NRC committee believe that extended site energy consumption understates the total energy consumed to make an appliance operational at the site. As a result, the NRC committee's primary general recommendation is for DOE to consider moving over time to use of a full-fuel-cycle measure of energy consumption for assessment of national and environmental impacts, especially levels of greenhouse gas emissions, and to providing more comprehensive information to the public through labels and other means, such as an enhanced Web site. For those appliances that use multiple fuels (*e.g.,* water heaters), the NRC committee believes that measuring full-fuel-cycle energy consumption would provide a more complete picture of energy used, allowing comparison across many different appliances as well as an improved assessment of impacts. The NRC committee also acknowledged the complexities inherent in developing a full-fuel-cycle measure of energy use and stated that a majority of the committee recommended a gradual transition to that expanded measure and eventual replacement of the currently used extended site measure. To improve consumers' understanding, the committee recommended that DOE and the Federal Trade Commission could evaluate potential indices of energy use and its impacts and could explore various options for label design and content using established consumer research methods.

DOE acknowledges that its site-to-source conversion factors do not capture the energy consumed in extracting, processing, and transporting primary fuels. DOE also agrees with the NRC committee's conclusion that developing site-to-source conversion factors that capture the energy associated with the extraction, processing, and transportation of primary fuels is inherently complex and difficult. As a result, DOE will evaluate whether moving to a full-fuel-cycle measure will enhance its ability to set energy-efficiency standards.

DOE also notes that the NRC committee's recommendation to use a full-fuel-cycle measure was especially focused on appliances using multiple fuels. For single-fuel appliances, the committee recommended that the current practice of basing energy efficiency requirements on the site measure of energy consumption should be retained. Although CCWs utilize heated water from both electric and natural gas water heaters and are credited with improved performance by reducing the energy used in electric and gas clothes dryers, the energy efficiency metric with which they are regulated, the MEF, is expressed in terms of electrical energy usage (cubic feet per kWh). As a result, for labeling and enforcement purposes, CCWs are a single-fuel appliance. Therefore, although a full-fuel-cycle measure may provide a better assessment of national and environmental impacts, it is not necessary for providing energy use comparisons among CCW models.

e. Energy Used in Water and Wastewater Treatment and Delivery

In the October 2008 NOPR, DOE did not include the energy required for water treatment and delivery. It stated that EPCA defines ''energy use'' to be ''the quantity of energy directly consumed by a consumer product at point of use, determined in accordance with test procedures under section 6293 of [42 U.S.C.].'' (42 U.S.C. 6291(4)) Based on the definition of ''energy use,'' DOE does not believe it has the authority to consider embedded energy (*i.e.,* the energy required for water treatment and delivery) in the analysis. Furthermore, even if DOE had the authority, it does not believe adequate analytical tools exist to conduct such an evaluation.[29]

The Joint Comment stated that DOE's purported legal justification ignores that EPCA not only provides ample authority for DOE to consider this impact, but actually commands its consideration in weighing the economic justification for efficiency standards. (Joint Comment, No. 44, pp. 12–13) It said that DOE's position that it lacks the authority to consider the energy embedded in water is untenable in light of 42 U.S.C. 6295(o)(2)(B)(i)(VII), which provides that in assessing the economic justification for a standard, DOE may consider any factors it concludes are relevant. It added that 42 U.S.C. 6295(o)(2)(B)(i)(III) directs DOE to consider, to the greatest extent practicable, ''the total projected amount of energy * * * savings likely to result directly from the imposition of such standard.'' It also stated that the plain language of EPCA thus commands that DOE assess the ''energy saving'' resulting from the standard, not simply the ''energy use'' of the covered products or equipment. Moreover, though the statute concerns those energy savings likely to ''result directly'' from the standard, that language merely requires DOE to isolate the standard's impact from other energy saving initiatives for purposes of the economic justification analysis. (Joint Comment, No. 44 at p. 12–13) Pacific Gas & Electric Company (PG&E) stated that because of the preciousness of water in California and the embodied energy in it, a higher standard for CCWs is merited. (PG&E, Public Meeting Transcript, No. 40.5 at pp. 136–137 and p. 181) Furthermore, PG&E commented that failing to consider energy in water due to the lack of an analytical tool is not acceptable. (PG&E, Public Meeting Transcript, No. 40.5 at pp. 178–179 and p. 183) Additional comments submitted by EJ, ASAP, and ACEEE, suggested that the energy embedded in the delivery and treatment of water and wastewater should be included in the determination of national energy savings from the standards proposed in the October 2008 NOPR. (EJ, Public Meeting Transcript,

[29] An analytical tool equivalent to EIA's NEMS would be needed to properly account for embedded energy impacts on a national scale, including the embedded energy due to water and wastewater savings. This new version of NEMS would need to analyze spending and energy use in dozens, if not hundreds, of economic sectors. This version of NEMS also would need to account for shifts in spending in these various sectors to account for the marginal embedded energy differences among these sectors. 72 FR 64432, 64498–99 (Nov. 15, 2007). DOE does not have access to such a tool or other means to accurately estimate the source energy savings impacts of decreased water or wastewater consumption and expenditures.

No. 40.5 at pp. 140–141 and p. 180; ASAP, Public Meeting Transcript, No. 40.5 at pp. 180–181; ACEEE, Public Meeting Transcript, No. 40.5 at p. 182)

DOE continues to maintain that it only has the authority to consider the quantity of energy directly consumed by the equipment at point of use, and the energy consumed in production and delivery of that energy, in determining the total projected amount of energy savings likely to result directly from the imposition of a standard. Although DOE does agree with the Joint Comment that energy is consumed in providing water and wastewater service, this energy is not directly consumed by the equipment or in production and delivery of the energy. Inclusion of the embedded energy associated with water and wastewater service, would, for completeness, also require inclusion of the energy associated with all other aspects of the installation and operation of the equipment, *e.g.* the manufacture, distribution, and installation of the equipment. Furthermore, since water districts charge all costs related to transporting, treating, and distributing water to their consumers, the embedded energy is already accounted for in the LCC analysis. Thus, while DOE could go through the theoretical exercise of disaggegrating energy costs from total water costs, the LCC results would not change since the total cost of operating equipment would not change.

f. Total Installed Costs and Operating Costs

The increase in total annual installed cost is equal to the difference in the per-unit total installed cost between the base case and standards case, multiplied by the shipments forecasted in the standards case. The annual operating cost savings per unit includes changes in energy, water, repair, and maintenance costs. DOE forecasted energy prices for the October 2008 NOPR based on *AEO 2008;* it updated the forecasts for today's SNOPR using data from *AEO 2009* April Release. For today's SNOPR, DOE maintained the accounting system it used to develop repair and maintenance costs for more efficient CCWs in the October 2008 NOPR.

g. Discount Rates

DOE multiplies monetary values in future years by the discount factor to determine the present value. DOE estimated national impacts using both a 3-percent and a 7-percent real discount rate, in accordance with guidance provided by the Office of Management and Budget (OMB) to Federal agencies on the development of regulatory analysis (OMB Circular A–4 (Sept.17, 2003), section E, ''Identifying and Measuring Benefits and Costs'').[30] The Joint Comment stated that DOE should use a 2 to 3 percent real discount rate for national impact analyses. (Joint Comment, No. 44 at p. 11) It noted that societal discount rates are the subject of extensive academic research, and the weight of academic opinion is that the appropriate societal discount rate is 3 percent or less. It urged DOE to give primary weight to results based on the lower of the discount rates recommended by OMB. OMB Circular A–4 references an earlier Circular A–94, which states that a real discount rate of 7 percent should be used as a base case for regulatory analysis. The 7 percent rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy. It approximates the opportunity cost of capital, and, according to Circular A–94, it is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector. OMB later found that the average rate of return to capital remains near the 7-percent rate estimated in 1992. Circular A–4 also states that when regulation primarily and directly affects private consumption, a lower discount rate is appropriate. ''The alternative most often used is sometimes called the social rate of time preference * * * the rate at which ''society'' discounts future consumption flows to their present value.'' It suggests that the real rate of return on long-term government debt may provide a fair approximation of the social rate of time preference, and states that over the last 30 years, this rate has averaged around 3 percent in real terms on a pre-tax basis. It concludes that ''for regulatory analysis, [agencies] should provide estimates of net benefits using both 3 percent and 7 percent.'' Consistent with OMB's guidance, DOE did not give primary weight to results derived using a 3-percent discount rate.

DOE also received comments regarding the discounting of emissions. The Joint Comment stated that DOE should not apply a discount rate to physical units of measure, such as tons of emissions or quads of energy. (Joint Comment, No. 44 at p. 11) Consistent with Executive Order 12866, ''Regulatory Planning and Review,'' 58 FR 51737 (Oct. 4, 1993), DOE follows the guidance of OMB regarding methodologies and procedures for regulatory impact analysis that affect more than one agency. Regarding energy and environmental benefits from energy conservation standards, DOE reported both discounted and undiscounted values. DOE retained the approach used in the October 2008 NOPR for today's SNOPR.

h. Effects of Standards on Energy Prices

For the October 2008 NOPR, DOE conducted an analysis of the impact of reduced energy demand associated with possible standards on CCWs on prices of natural gas and electricity. The Joint Comment stated that the electricity price mitigation effects of the standard proposed in the October 2008 NOPR should be documented and the value of reduced electricity bills to all consumers quantified as a benefit. (Joint Comment, No. 44 at p. 11) The DOE analysis found that gas and electric demand reductions resulting from max-tech standards for CCWs would have no detectable change on the U.S. average wellhead natural gas price or the average user price of electricity. DOE concluded that CCW standards will not provide additional economic benefits resulting from lower energy prices. Thus, for today's SNOPR DOE has made no change to its assumptions about the effects of standards on energy prices. See chapter 11 of the SNOPR TSD for more details.

F. Consumer Subgroup Analysis

In the October 2008 NOPR, DOE analyzed the potential effects of CCW standards on two subgroups: (1) Consumers not served by municipal water and sewer providers, and (2) small businesses. For consumers not served by water and sewer, DOE analyzed the potential impacts of standards by conducting the analysis with well and septic system prices, rather than water and wastewater prices based on RFC/AWWA data. For small CCW businesses, DOE analyzed the potential impacts of standards by conducting the analysis with different discount rates, because small businesses do not have the same access to capital as larger businesses. DOE estimated that for businesses purchasing CCWs, the average discount rate for small companies is 3.5 percent higher than the industry average. Due to the higher costs of conducting business, as evidenced by their higher discount rates, the benefits of CCW standards for small businesses will be lower than for the general population of CCW owners. For today's SNOPR DOE has made no changes to its assumptions about benefits of CCW standards to small businesses.

DOE received comments regarding the economic impacts of higher initial clothes washer costs. Alliance and MLA stated that the standards proposed in

[30] OMB circulars are available online at: *http://www.whitehouse.gov/omb/circulars/.*

the October 2008 NOPR would result in substantial price increases for customers of central area laundry rooms, especially for elderly, low-income, college students, and disabled end-users. MLA stated that a majority of the 35–50 million CCW customers are low- or low-to-middle income people, many of whom are elderly or who suffer disabilities. (Alliance, No. 45 at p. 1 and Attachment 2, p. 12; MLA, No. 49 at pp. 1–4) PG&E commented that lower-income consumers may pay higher energy costs in laundry rooms using older machines than those who have access to new machines. (PG&E, Public Meeting Transcript, No. 40.5 at p. 25) DOE research suggests that the end-users of CCWs are unlikely to be the owners of the equipment. Although low-income end-users do utilize CCWs, it is unknown to what affect more efficient CCWs will impact their cost of using the equipment. If the price of operating a CCW to an end-user does increase, DOE estimates that such an increase would occur only if the CCW owner needed to increase the price of operation to recover or capture its increased costs of providing more efficient equipment while not benefitting from the lower utility consumption. Although DOE does recognize that this could occur, it is equally likely that the price of operation to end-users would not increase as the increased expense to the CCW owner of providing more efficient CCWs is more than offset by lifetime utility bill savings from the more-efficient CCW. More details on the consumer subgroup analysis can be found in chapter 12 of the SNOPR TSD.

G. Manufacturer Impact Analysis

DOE performed an MIA to estimate the financial impact of amended energy conservation standards on CCW manufacturers, and to calculate the impact of such standards on domestic manufacturing employment and capacity. The MIA has both quantitative and qualitative aspects. The quantitative part of the MIA primarily relies on the GRIM—an industry-cash-flow model customized for this rulemaking. The GRIM inputs are data characterizing the industry cost structure, shipments, and revenues. The key output is the INPV. Different sets of assumptions (scenarios) will produce different results. The qualitative part of the MIA addresses factors such as equipment characteristics, characteristics of particular firms, and market and equipment trends, and it also includes an assessment of the impacts of standards on subgroups of manufacturers. DOE outlined its methodology for the MIA in the October 2008 NOPR. 73 FR 62034, 62075–81 (Oct. 17, 2008). The complete MIA for the October 2008 NOPR is presented in chapter 13 of the NOPR TSD.

For today's supplemental notice, DOE updated the MIA results based on several changes to other analyses that impact the MIA. The total shipments and efficiency distributions were updated using the new estimates outlined in the SNOPR NIA. The MIA also uses the new analysis period in the NIA (2013–2043) and has updated the base year to 2009. As discussed in section III.C.2, DOE updated the manufacturer production costs and the capital and equipment conversion costs to 2008$ using the producer price index for commercial laundry equipment manufacturing (NAICS 333312). DOE updated the GRIM to allow the inclusion of Federal production tax credits. DOE discusses the assumptions and methodology used to calculate the Federal production tax in appendix 13C and in the section below. For details of the MIA, see chapter 13 of the SNOPR TSD.

DOE also received a number of comments from interested parties in response to the MIA analysis presented in the October 2008 NOPR. Alliance stated that the top-loading CCW energy conservation standard proposed in the October 2008 NOPR would eliminate Alliance from the CCW market, and eliminate top-loading CCWs from the market as well. (Alliance, No. 45 at Attachment 2, p. 3) Alliance stated that, if it were to exit the CCW market, the CCW market would suffer significant competitive harm. Alliance also stated that more than 20 route operators and the MLA are opposed to the standard proposed in the October 2008 NOPR because it would result in a loss of competition. (Alliance, No. 45 at p. 1 and Attachment 2, pp. 6–12) Alliance stated that the lower CCW market competition could lead to price increases from Alliance's competitors, such as the combined Whirlpool and Maytag entities, which currently control 72 percent of the RCW market. Alliance predicted that these manufacturers would control about 90 percent of the CCW market if Alliance were to stop making CCWs. Alliance sees this outcome as a monopoly for Whirlpool. (Alliance, Public Meeting Transcript, No. 40.5 at p. 24)

Alliance stated that it cannot justify the investment necessary to develop the technology required to reach the top-loading energy conservation standard proposed in the October 2008 NOPR. Alliance cited a lack of resources as the LVM to justify an investment in a ''non-traditional'' top-loader with unknown market acceptance (Alliance, No. 45 at Attachment 2, p. 8). Alliance stated that the top-loading standard proposed in the October 2008 NOPR would likely result in significant, detrimental impacts to the LVM, as Alliance does not have the resources for research and development, re-configuring production lines, or licensing the advanced technology required to meet the standard. (Alliance, Public Meeting Transcript, pp. 23–24) Alliance believes that a top-loading energy conservation standard set at 1.42 MEF/9.5 WF would lessen these impacts. Alliance suggested that the top-loading CCW energy conservation standard proposed in the October 2008 NOPR would force Alliance to cease production of CCWs due to the high investment costs required to design and manufacture the technology to meet the standard. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 22–24 and p. 202; Alliance, No. 45 at Attachment 2, pp. 7–8) Alliance estimates these costs based on its belief that non-traditional technology will be required to meet the standard with wash performance that would be acceptable for commercial laundromat use.

MLA commented that the top-loading CCW standard proposed in the October 2008 NOPR would most likely result in the elimination of all but one manufacturer of top-loading CCWs (Whirlpool) as well as the elimination of many route operators due to higher equipment costs resulting from reduced competition. (MLA, No. 49 at pp. 1–3) Finally, EEI suggested that DOE create a standard that will save energy and be market neutral, such that multiple manufacturers could meet it. (EEI, No. 56 at pp. 2–3)

EPCA directs DOE to consider any lessening of competition that is likely to result from standards. It directs the Attorney General to determine the impact, if any, of any lessening of competition likely to result from a proposed standard and to transmit such determination to the Secretary, not later than 60 days after the publication of a proposed rule, together with an analysis of the nature and extent of such impact. (42 U.S.C. 6295(o)(2)(B)(i)(V) and (B)(ii)). DOE received a response from the Acting Assistant Attorney General on December 16, 2008. The letter stated that the Department of Justice (DOJ) is not in a position to judge whether CCW manufacturers will be able to meet the standards proposed in the October 2008 NOPR. Nevertheless, DOJ found a ''real risk that one or more of these manufacturers cannot meet the proposed standard'' for top-loading CCWs published in the October 2008

NOPR. (Attorney General, No. 53 at p. 2)

In the October 2008 NOPR, DOE noted the concerns regarding the proposed conservation standards for top-loading CCWs in particular. 73 FR 62034, 62103–104 (Oct. 17, 2008). DOE also included a section in chapter 13 of the TSD that estimated likely financial impacts for the LVM to meet the efficiency standards proposed in the 2008 NOPR. DOE continues to offer a sub-group assessment of the differential impacts on the LVM in chapter 13.

In response to concerns raised by DOJ and other concerns raised by interested parties, DOE is proposing in today's SNOPR a 1.60 MEF/8.5 WF standard for top-loading CCWs. DOE believes that this proposed energy conservation standard will greatly ease the competitive concerns of Alliance, GE, MLA, and DOJ. DOE research suggests that today's proposed standard is within reach of all competitors in the market, since the max-tech unit is based on a standard RCW top-loading platform (*i.e.* one with an agitator) and that no proprietary technologies were used. DOE research suggests that Alliance currently produces a model with 1.5 MEF/8.8 WF that DOE believes can be modified to meet today's proposed standard. As such, a dramatic decline in competition in the CCW industry does not seem likely since all manufacturers should be able to release a washer with similar technology at the present efficiency level. DOE requests comment on competitive concerns at today's proposed standard.

Alliance and GE commented that the top-loading standard proposed in the October 2008 NOPR would have a detrimental impact on the CCW industry and labor force. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 23–24; Alliance, No. 45 at Attachment 2, p. 3; GE, Public Meeting Transcript, No. 40.5 at pp. 31–32) Furthermore, Alliance stated that no manufacturer will be willing to use an unproven non-traditional design in the commercial market, resulting in the elimination of top-loading CCW production. With manufacturers like Alliance exiting the business, over 1,000 jobs would be lost. Alliance also stated that there could be spillover harm because Alliance could also exit other laundry market segments. (Alliance, No. 45 at Attachment 2, p. 17)

For the October 2008 NOPR, DOE calculated the direct employment impacts using the GRIM and information gathered from interviews with manufacturers. In the October 2008 NOPR, DOE estimated that there would be positive employment impacts among domestic commercial clothes washer manufacturers for TSL 1 through TSL 5. Because production labor expenditures are assumed to be a fixed percentage of the Cost of Goods Sold (COGS) and the Manufacturing Product Costs (MPCs) increase with more efficient equipment, labor tracks the increased prices in the GRIM. The GRIM predicts a steady level of domestic employment after standards at a level based on the increase in relative price. Because the LVM had previously stated it would be eliminated from the commercial market, DOE also specifically investigated the LVM employment using its commercial washer revenues and additional employment estimates. DOE's scenarios included one in which the LVM ceased to produce soft-mount washers or standard dryers and a scenario with a complete closure of the LVM's domestic manufacturing plant. DOE estimated that the LVM's ceasing to produce soft-mount dryers and CCWs would result in 292 lost production jobs and that a complete closure of the facility would result in the dismissal of approximately 600 factory employees. 73 FR 60234, 62102–3 (Oct. 17, 2008). DOE believes that the energy conservation standard proposed in today's notice will allow the LVM to continue to produce top-loading CCWs, mitigating any potential closure of its domestic manufacturing facility. Further discussion of the LVM and the potential impacts on direct employment for the CCW industry is presented in chapter 13 of the TSD.

DOE received comments on the likely benefits of Federal producer tax credits for which some CCW manufacturers could be eligible. Such credits accrue to manufacturers on the basis of appliance or equipment efficiencies as well as other eligibility requirements. The Joint Comment stated that DOE did not account for Federal production tax credits for efficient appliances produced after 2007 in the MIA and that the LVM is likely to disproportionately benefit from these Federal production tax incentives. According to the Joint Comment, the Federal production tax credits should substantially off-set conversion capital requirements and equipment conversion expenses, mitigating the financial impacts of higher efficiency levels. (Joint Comment, No. 44 at pp. 7–10)

For the October 2008 NOPR, DOE did not fully account for the impacts of the Federal production tax credits updated by The Energy Improvement and Extension Act of 2008 (Pub. L. 110–343; EIEA 2008). However, DOE research suggests that the Joint Comment overstates the potential benefits that CCW manufacturers would accumulate through the tax credits found in EIEA 2008. A key assumption in the Joint Comment analysis is that all major CCW manufacturers indentified for this rulemaking would be able to benefit from the tax credit (Joint Comment, No. 44 at pp. 8–9). According to the title III, section 305 (b)(2) from EIEA 2008, and title I section 1334 (c)(1)(B) from EPACT 2005, the tax credit is only awarded for equipment produced in the United States. Using market research and interviews with manufacturers, DOE believes that only the LVM produces qualifying CCWs. Other manufacturers offer washers that meet the MEFs and WF requirements, but these washers are either made outside the United States or are sourced from other domestic manufacturers, or are not sold in the commercial market. See appendix 13C of the SNOPR TSD for further discussion of the Federal production tax credit.

According to the Joint Comment, the Federal production tax credit could be used by the industry to offset the conversion costs necessary to comply with the energy conservation standards proposed in the October 2008 NOPR. (Joint Comment, No. 44 at p. 7) In its analysis, the Joint Comment does not account for any conversion costs associated with a complete production transfer of top-load to front-load washers. The equipment conversion and capital conversion cost shown in the GRIM and chapter 13 take all existing front-loading washers into consideration, including those that qualify for the Federal production tax credit. In its calculation of the equipment and capital conversion costs, DOE considered that the LVM already had qualifying washers at both 2.0 MEF/6.0 WF and 2.2 MEF/4.5 WF levels; hence, no additional product development appeared necessary to achieve these efficiency levels. Therefore, DOE did not include any capital or product conversion costs in the GRIM for the LVM at a 2.0 MEF level. However, DOE research suggested that the LVM would have some capital conversion costs if the front-loading efficiency level were raised to 2.2 MEF, because the production levels of such washers would have to dramatically increase from present shipment levels.

DOE acknowledges that the Federal production tax credit could have mitigating effects in lessening the impacts due to energy conservation standards. However, as described above and in appendix 13C, DOE estimates the benefits of Federal production tax credits for CCW manufacturers will not greatly mitigate the impacts due amended energy conservation

standards. In the GRIM, DOE accounts for the Federal tax credit as a direct cash benefit in the base and standards cases that increases the INPV. This increase in industry value lessens the impacts on manufacturers due to amended energy conservation standards. However, because the benefit of the Federal production tax credit is less significant than calculated in the Joint Comment and mostly occurs outside the analysis period, the benefits do not substantially impact the INPV calculated by DOE.

Because only the LVM produces qualifying CCWs, DOE based its estimates of the potential benefits to the CCW industry by estimating the potential Federal production tax credits that the LVM could receive. Using publically available information, recent SEC filings, and the information published in chapter 13 and appendix 13A of the October 2008 NOPR, DOE estimated the LVM's front-loading CCW shipment projections to 2010. These estimates suggest that the LVM could collect $2.8 million in Federal production tax credits from 2008–2010 from the provisions updated by EIEA 2008 and $4.1 million from the program from 2007 to 2010. Based on its calculations, the LVM received the biggest benefit from the tax credit in 2008. According to the ENERGY STAR database,[31] the LVM released a model that qualified for the $250 Federal production tax credit on September 26, 2008, shortly before EIEA 2008 was enacted. Because the higher tax credits were retroactive for all of 2008, the LVM received a $2.4 million Federal tax credit in 2008 because it had substantially increased production of qualifying front-loading CCWs. Using the LVM's SEC Form 10–Q for the quarter ending March 31, 2009,[32] DOE estimates that in 2009 the LVM will receive $385,000 in Federal production tax credits. DOE estimates that the LVM is unlikely to qualify for any additional Federal production tax credit in 2010 even if the volume of qualifying washers increases. DOE has a more extensive explanation of its calculations of the Federal production tax credits in appendix 13C of the SNOPR TSD.

The Joint Comment bases its analysis on manufacturers completely shifting production to front-loading washers. However, DOE believes that it is unlikely all manufacturers would shift production to exclusively front-loading washers in response to the Federal production tax credits or the energy conservation standards proposed in today's rule. As discussed in section III.E, in response to the Federal production tax credit, DOE estimates that the tax credits would permanently transform the market so that front-loading washers would continue to comprise 30 percent of the market over the entire forecast period. This shift towards front-loading washers has mitigating effects on the impacts on manufacturers due to energy conservation standards. However, the shift is not great enough to significantly decrease the impacts as the Joint Comment suggests. Using the same assumptions used for calculations found in appendix 13A, DOE estimates that the LVM increased the production of front-loading washers by approximately 10,000 washers in 2007 and 2008. Though the estimates show that there were significant increases in front-loading shipments for the LVM in 2007 and 2008, shipments for fiscal year 2009 are projected to decrease and hence reduce the Federal production tax credits.

The Joint Comment acknowledges but does not account for factors that would offset the benefits from the Federal production tax credit that would accrue to CCW manufacturers. In its LVM analysis for the October 2008 NOPR, DOE examined the capital costs that would be required to create a front-loading washer facility for 100,000 annual unit shipments. DOE estimated that a green-field facility with all production equipment would cost the LVM approximately $54 million. In that same analysis, DOE estimated that the total tooling required would cost approximately $18 million. If the LVM had to invest to exclusively offer front-loading washers, these investments would more than offset the benefit calculated in the Joint Comment for all CCW manufacturers. In fact, the tooling alone would more than eliminate the benefit calculated for the entire CCW industry in the Joint Comment. The Joint Comment states that the LVM is in a position to disproportionately benefit from the Federal production tax credit. (Joint Comment, No. 44 at p. 8) While DOE acknowledges that the LVM is the only manufacturer eligible to receive a Federal production tax credit in the CCW market, DOE research suggests that the LVM would not disproportionately benefit because the costs to upgrade its production facilities for higher-volume front-loading washer manufacturing, in addition to necessary redesigns of its existing front-loading washers, are estimated to be multiples of the tax credit. For further information, see appendix 13C of the SNOPR TSD. The Joint Comment also states that part of the Federal production tax credit will need to be shared with distributors and customers to stimulate growth. (Joint Comment, No. 44 at p. 9) However, the Joint Comment does not reduce the benefit to the CCW industry that would occur if manufacturers did not keep all of the tax credit.

DOE received comment regarding its characterization of CCW manufacturers and the LVM in particular. The Joint Comment argued that DOE should not characterize Alliance as an LVM, as the LVM reported revenues equivalent to approximately half of the total CCW revenue and claims to be the leading manufacturer of stand-alone commercial laundry equipment in North America. (Joint Comment, No. 44 at p. 7) For the October 2008 NOPR, DOE presented a separate analysis of the LVM. 73 FR 62034, 62103–104 (Oct. 17, 2008). Although DOE agrees with the Joint Comment that the LVM has a significant share of the CCW industry based on revenues in reports filed with the SEC, DOE believes that the LVM does not have the same overall clothes washer manufacturing scale as its competitors (for both residential products and commercial equipment) and should be characterized as an LVM.

In the LVM analysis, DOE notes that most CCWs on the market in the United States are based largely on RCW platforms that are upgraded selectively. Some investments (such as the controllers) are CCW-specific but only make up part of the total unit cost. The majority of capital expenditures related to tooling, equipment, and other machinery in a plant can usually be applied to the residential as well as the commercial market. Thus, overall (both RCW and CCW) manufacturing scale has a significant impact on the cost-effectiveness of potential upgrades. A manufacturer with a high-volume residential line can cost justify much more capital-intensive solutions if they are applicable in both markets, in contrast to an LVM which lacks the scale to make the investments worthwhile. Thus, an LVM may be required to purchase upgrade options from third-party vendors instead of developing in-house solutions that reduce costs at higher volumes. In the clothes washer market, the most direct CCW competitor has over 60 times the overall shipment volumes of the LVM. This scale difference also relates to purchasing power. A large, diversified appliance manufacturer can use its production scale to achieve better prices

[31] ENERGY STAR Qualified Commercial Clothes Washers. Available online at: *http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_commercial_cw.*

[32] The Alliance 10–Q Form is available at *http://sec.gov/Archives/edgar/data/1063697/000119312509107306/d10q.htm.*

for raw materials and commonly purchased components like controllers, motors, belts, switches, sensors, and wiring harnesses. Even if a large company purchases fewer items of a certain component, its overall revenue relationship with a supplier may still enable it to achieve better pricing than a smaller competitor, even if that competitor buys certain components in higher quantities. Lastly, high-volume manufacturers benefit from being able to source their components through sophisticated supply chains on a worldwide basis. A low-volume manufacturer is unlikely to be able to compete solely on manufacturing cost.

DOE seeks comment on the determination of manufacturer impacts, including the effects of manufacturer tax credits and competitive concerns. This is identified as Issue 5 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment.)

H. Employment Impact Analysis

DOE considers employment impacts in the domestic economy as one factor in selecting a proposed standard. Employment impacts include direct and indirect impacts. Direct employment impacts are changes in the number of employees for manufacturers of equipment subject to standards, their suppliers, and related service firms. The MIA addresses these impacts.

Indirect employment impacts from standards consist of the net jobs created or eliminated in the national economy, other than in the manufacturing sector being regulated, due to: (1) Reduced spending by end users on energy (electricity, gas (including liquefied petroleum gas), and oil); (2) reduced spending on new energy supply by the utility industry; (3) increased spending on the purchase price of new equipment; and (4) the effects of those three factors throughout the economy. DOE expects the net monetary savings from standards to be redirected to other forms of economic activity. DOE also expects these shifts in spending and economic activity to affect the demand for labor in the short term, as explained below.

One method for assessing the possible effects on the demand for labor of such shifts in economic activity is to compare sectoral employment statistics developed by the BLS. The BLS regularly publishes its estimates of the number of jobs per million dollars of economic activity in different sectors of the economy, as well as the jobs created elsewhere in the economy by this same economic activity. Data from BLS indicate that expenditures in the utility sector generally create fewer jobs (both directly and indirectly) than expenditures in other sectors of the economy. There are many reasons for these differences, including wage differences and the fact that the utility sector is more capital intensive and less labor intensive than other sectors. (See Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System* (RIMS II), Washington, DC, U.S. Department of Commerce (1992).) Efficiency standards have the effect of reducing consumer utility bills. Because reduced consumer expenditures for energy likely lead to increased expenditures in other sectors of the economy, the general effect of efficiency standards is to shift economic activity from a less labor-intensive sector (*i.e.*, the utility sector) to more labor-intensive sectors (*e.g.*, the retail and manufacturing sectors). Thus, based on the BLS data alone, DOE believes net national employment will increase due to shifts in economic activity resulting from standards for CCWs.

In developing the October 2008 NOPR and today's SNOPR, DOE estimated indirect national employment impacts using an input/output model of the U.S. economy called Impact of Sector Energy Technologies (ImSET).[33] ImSET is a special-purpose version of the ''U.S. Benchmark National Input-Output'' (I–O) model designed to estimate the national employment and income effects of energy-saving technologies. The ImSET software includes a computer-based I–O model with structural coefficients to characterize economic flows among 188 sectors most relevant to industrial, commercial, and residential building energy use. The Joint Comment stated that DOE must consider its projections that an increase in employment will result from the adoption of standards in weighing the economic costs and benefits of strong efficiency standards. (Joint Comment, No. 44 at p. 13) As described in section V.B.3 below, DOE takes into consideration the indirect employment impacts estimated using ImSET when evaluating alternative standard levels. Direct employment impacts on the manufacturers that produce CCWs are analyzed in the MIA, as discussed in section III.G. For today's SNOPR, DOE has made no change to its method for estimating employment impacts. For further details, see chapter 15 of the SNOPR TSD.

[33] More information regarding ImSET is available online at: *http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15273.pdf.*

I. Utility Impact Analysis

The utility impact analysis estimates the change in the forecasted power generation capacity for the Nation, which would be expected to result from adoption of new standards. This analysis separately determines the changes to supply and demand as a result of natural gas, fuel oil, liquefied petroleum gas, or electricity residential consumption savings due to the standard. For the October 2008 NOPR and today's SNOPR, DOE calculated this change using the NEMS–BT computer model. NEMS–BT models certain policy scenarios such as the effect of reduced energy consumption per TSL by fuel type. The analysis output provides a forecast for the needed generation capacities at each TSL. The estimated net benefit of the standard for today's SNOPR is the difference between the forecasted generation capacities by NEMS–BT and the *AEO 2009* April Release Reference Case. DOE obtained the energy savings inputs associated with electricity and natural gas consumption savings from the NIA. These inputs reflect the effects of efficiency improvement on CCW energy consumption, both fuel (natural gas) and electricity. Chapter 14 of the SNOPR TSD presents results of the utility impact analysis.

In its October 2008 NOPR, DOE did not estimate impacts on water and wastewater utilities because the water and wastewater utility sector is more complicated than either the electric utility or gas utility sectors, with a high degree of geographic variability produced by a large diversity of water resource availability, institutional history, and regulatory context. 73 FR 62034, 62082 (Oct. 17, 2008). For today's SNOPR, for the reasons cited above, DOE did not estimate impacts to the water and wastewater utility sector.

J. Environmental Assessment

Pursuant to the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 *et seq.*) 42 U.S.C. 6295(o)(2)(B)(i)(VI), DOE prepared a draft environmental assessment (EA) of the potential impacts of the proposed standards for CCWs it considered for today's supplemental notice which it has included as chapter 16 of the TSD for the SNOPR. DOE found the environmental effects associated with the standards for CCWs to be insignificant. Therefore, DOE is issuing a Finding of No Significant Impact (FONSI), pursuant to NEPA, the regulations of the Council on Environmental Quality (40 CFR parts 1500–1508), and DOE's regulations for

compliance with NEPA (10 CFR part 1021). The FONSI is available in the docket for this rulemaking.

In the EA, DOE estimated the reduction in power sector emissions of CO_2 and NO_X using the NEMS–BT computer model. DOE also calculated a range of estimates for reduction in Hg emissions using power sector emission rates. The EA does not include the estimated reduction in power sector impacts of sulfur dioxide (SO_2), because DOE has determined that any such reduction resulting from an energy conservation standard would not affect the overall level of SO_2 emissions in the United States due to the presence of national caps on SO_2 emissions. These topics are addressed further below; see chapter 16 of the TSD for additional detail.

NEMS–BT is run similarly to the *AEO 2009 April Release* NEMS, except that CCW energy use is reduced by the amount of energy saved (by fuel type) due to the TSLs. The inputs of national energy savings come from the NIA analysis. For the EA, the output is the forecasted physical emissions. The net benefit of a standard is the difference between emissions estimated by NEMS–BT and the *AEO 2009* April Release Reference Case. The NEMS–BT tracks CO_2 emissions using a detailed module that provides results with broad coverage of all sectors and inclusion of interactive effects.

Title IV of the Clean Air Act sets an annual emissions cap on SO_2 for all electric generating units. The attainment of the emissions cap is flexible among generators and is enforced through the use of emissions allowances and tradable permits. In other words, with or without a standard, total cumulative SO_2 emissions will always be at or near the ceiling, while there may be some timing differences between year-by-year forecast. Thus, it is unlikely that there will be reduced SO_2 emissions from standards as long as there is enforcement of the emissions ceilings. Although there may not be an actual reduction in SO_2 emissions, there still may be an economic benefit from reduced demand for SO_2 emission allowances. Electricity savings decrease the generation of SO_2 emissions from power production, which can lessen the need to purchase SO_2 emissions allowance credits, and thereby decrease the costs of complying with regulatory caps on emissions.

NO_X emissions from 28 eastern States and the District of Columbia (D.C.) are limited under the Clean Air Interstate Rule (CAIR), published in the **Federal Register** on May 12, 2005.[34] Although CAIR has been remanded to EPA by the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit), it will remain in effect until it is replaced by a rule consistent with the Court's July 11, 2008 opinion in *North Carolina* v. *EPA*.[35] Because all States covered by CAIR opted to reduce NO_X emissions through participation in cap and trade programs for electric generating units, emissions from these sources are capped across the CAIR region.

For the 28 eastern States and D.C. where CAIR is in effect, no NO_X emissions reductions will occur due to the permanent cap. Under caps, physical emissions reductions in those States would not result from the energy conservation standards under consideration by DOE, but standards might have produced an environmentally related economic impact in the form of lower prices for emissions allowance credits, if they were large enough. However, DOE determined that in the present case, such standards would not produce an environmentally related economic impact in the form of lower prices for emissions allowance credits, because the estimated reduction in NO_X emissions or the corresponding allowance credits in States covered by the CAIR cap would be too small to affect allowance prices for NO_X under the CAIR. In contrast, new or amended energy conservation standards would reduce NO_X emissions in those 22 States that are not affected by CAIR. As a result, the NEMS–BT does forecast emission reductions from the CCW standards considered in today's supplemental notice.

In the October 2008 NOPR, however, DOE provided a different estimate of NO_X reductions, because DOE assumed that the CAIR had been vacated. 74 FR 16920, 17009–14 (April 13, 2009). This is because the CAIR was vacated by the D.C. Circuit in its July 11, 2008 decision in *North Carolina* v. *Environmental Protection Agency*. 531 F.3d 896 (D.C. Cir. 2008). Thus, for the October 2008 NOPR, DOE established a range of NO_X reductions based on low and high emissions rates (in kt of NO_X emitted per terawatt-hour (TWh) of electricity generated) derived from the *AEO 2008*. DOE anticipated that, in the absence of the CAIR's trading program, the new or amended energy conservation standards would reduce NO_X emissions nationwide, not just in 22 States.

Similar to SO_2 and NO_X, future emissions of Hg would have been subject to emissions caps under Clean Air Mercury Rule (CAMR) [70 FR 28606 (May 18, 2005)], which would have permanently capped emissions of Hg for new and existing coal-fired plants in all States by 2010, but the CAMR was vacated by the D.C. Circuit in its decision in *New Jersey* v. *Environmental Protection Agency* prior to the publication of the October 2008 NOPR. 517 F.3d 574 (D.C. Cir. 2008). However, the NEMS–BT model DOE initially used to estimate the changes in emissions for the proposed rule assumed that Hg emissions would be subject to CAMR emission caps.

After CAMR was vacated, DOE was unable to use the NEMS–BT model to estimate any changes in the physical quantity of Hg emissions (anywhere in the country) that would result from standard levels it considered in the October 2008 NOPR. Instead, DOE used an Hg emission rate (in metric tons of Hg per energy produced) based on the *AEO 2008*. Because virtually all Hg emitted from electricity generation is from coal-fired power plants, DOE based the emission rate on the metric tons of Hg emitted per TWh of coal-generated electricity. To estimate the reduction in Hg emissions, DOE multiplied the emission rate by the reduction in coal-generated electricity associated with standards considered. Because the CAMR is still vacated, DOE continued to use the approach utilized for the October 2008 NOPR, updated for the *AEO 2009* April Release to estimate the Hg emission reductions due to standards for today's SNOPR.

In addition to electricity, the operation of gas-fired CCWs results in emissions of CO_2 and NO_X at the sites where the appliances are used. NEMS–BT provides no means for estimating such emissions. Therefore, DOE calculated separate estimates of the effect of the potential standards on site emissions of CO_2 and NO_X based on emissions factors derived from the literature. Because natural gas combustion does not yield SO_2 emissions, DOE did not report in either the October 2008 NOPR or today's SNOPR the effect of the proposed standards on site emissions of SO_2.

K. Monetizing Carbon Dioxide and Other Emissions Impacts

DOE also calculated the possible monetary benefit of CO_2, NO_X, and Hg reductions. Cumulative monetary benefits were determined using discount rates of 3 and 7 percent. DOE monetized reductions in CO_2 emissions due to standards in this proposed rule

[34] 70 FR 25162 (May 12, 2005).

[35] 531 F.3d 896 (D.C. Cir. 2008); see also *North Carolina* v. *EPA*, 550 F.3d 1176 (D.C. Cir. 2008).

based on a range of monetary values drawn from studies that attempt to estimate the present value of the marginal economic benefits (based on the avoided marginal social costs of carbon) likely to result from reducing greenhouse gas emissions. The marginal social cost of carbon is an estimate of the monetary value to society of the environmental damages of CO_2 emissions.

Several parties provided comments regarding the economic valuation of CO_2 for the October 2008 NOPR. Whirlpool does not support an attempt to value those emissions as part of this rulemaking. (Whirlpool, No. 50 at p. 8) EEI stated that utilities have embedded the cost of complying with existing environmental legislation in their price for electricity, and a similar approach may be reasonable for valuing reduced CO_2 emissions. (EEI, Public Meeting Transcript, No. 40.5 at pp. 194–195) The Joint Comment stated that DOE's valuation of avoided CO_2 emissions should utilize EIA's analysis of the Climate Security Act. The core scenario of this analysis yields a $17 price per ton of CO_2, with an annual 7.4 percent increase. (Joint Comment, No. 44 at p. 12) As discussed in section V.B.6, DOE has updated the approach described in the October 2008 NOPR (73 FR 62034, 62107 (Oct. 17, 2008)) for its monetization of environmental emissions reductions for today's SNOPR.

Although this rulemaking does not affect SO_2 emissions or NO_X emissions in the 28 eastern States and D.C. where CAIR is in effect, there are markets for SO_2 and NO_X emissions allowances. The market clearing price of SO_2 and NO_X emissions allowances is roughly the marginal cost of meeting the regulatory cap, not the marginal value of the cap itself. Further, because national SO_2 and NO_X emissions are regulated by a cap and trade system, the cost of meeting these caps is included in the price of energy. Thus, the value of energy savings already includes the value of SO_2 and NO_X control for those consumers experiencing energy savings. The economic cost savings associated with SO_2 and NO_X emissions caps is approximately equal to the change in the price of traded allowances resulting from energy savings multiplied by the number of allowances that would be issued each year. That calculation is uncertain because the energy savings from new or amended standards for CCWs would be so small relative to the entire electricity generation market that the resulting emissions savings would have almost no impact on price formation in the allowances market. These savings would most likely be outweighed by uncertainties in the marginal costs of compliance with SO_2 and NO_X emissions caps.

As reported above in section III.D.4.a, the Joint Comment stated that to realistically depict energy prices in the future, DOE must consider the impact of carbon control legislation, since such legislation is very likely. The Joint Comment also noted that there are regional cap and trade programs that are in effect in the Northeast (Regional Greenhouse Gas Initiative (RGGI)) and the West (Western Climate Initiative (WCI)) that will impact the price of electricity and are not reflected in the *AEO* energy price forecasts. (Joint Comment, No. 44 at p. 12) EJ stated that caps will likely be in place by the time new standards become effective, so DOE should increase its electricity prices to reflect the cost of complying with emission caps. (EJ, Public Meeting Transcript, No. 40.5 at pp. 105–106)

In response, DOE incorporated current trends in its analysis, but expressly did not include possible future legislation in this rulemaking. The current NEMS–BT model used in projecting the environmental impacts includes the CAIR rule, as described above, which is projected to reduce SO_2 and NO_X emissions. NEMS–BT also takes into account the current set of State-level renewable portfolio standards, the effect of the RGGI, and utility investor reactions to the possibility of future CO_2 cap and trade programs, all of which impact electricity prices and reduce the projected carbon intensity of generation. The most recent Reference Case, *AEO 2009*, is available at *http://www.eia.doe.gov/oiaf/servicerpt/stimulus/index.html*, and documentation of the *AEO 2009* assumptions is available at *http://www.eia.doe.gov/oiaf/aeo/assumption/index.html*.

In its October 2008 NOPR, DOE conducted a separate analysis of wastewater discharge impacts as part of the environmental assessment for commercial clothes washers. 73 FR 62034, 62112–3 (Oct. 17, 2008). For today's supplemental proposed rule, DOE retained the same analysis method for estimating wastewater discharge impacts. The results are presented below in section V.B.6.

DOE seeks comment on the determination of environmental impacts. This is identified as Issue 6 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment).

IV. Discussion of Other Comments

A. Proposed TSLs for Commercial Clothes Washers

For the October 2008 NOPR, DOE based the TSLs on efficiency levels explored in the November 2007 ANOPR, and selected the TSLs on consideration of economic factors and current market conditions. ASAP suggested that DOE set TSLs based upon industry benchmarks such as current and forthcoming ENERGY STAR qualification levels and pending Federal tax incentive performance levels. (ASAP, Public Meeting Transcript, No. 40.5 at p. 33 and pp. 148–149) EIEA 2008 provided an Energy Efficient Appliance Credit to manufacturers for any RCW or CCW (front-loading or top-loading) produced domestically through 2010 with an efficiency level of at least 2.0 MEF/6.0 WF, or a larger credit for one that achieves 2.2 MEF/4.5 WF. The legislation also provides a separate tax credit for any top-loading RCW that achieves an efficiency level of at least 1.72 MEF/8.0 WF or a larger credit for one that exceeds 1.8 MEF/7.5 WF. DOE considered the impacts of these tax credits on the CCW industry in detail as part of the MIA. DOE accounts for the Federal tax credit as a direct cash benefit in the base and standards cases that increases the INPV. See section III.G of today's supplemental notice and appendix 13C of the SNOPR TSD for further discussion of this issue.

B. Proposed Standards for Commercial Clothes Washers

For the October 2008 NOPR, DOE made the preliminary determination that the standards for top-loading and front-loading CCWs listed in Table II.1 are technologically feasible and economically justified, and invited comment on these proposed standard levels.

In response, Alliance stated that it would likely exit the clothes washer market if standards based on a single CCW equipment class were enacted, which would result in domestic job losses, a CCW market disruption, and/or loss of competition in the CCW market. (Alliance, No. 45 at Attachment 2, pp. 6–12) Alliance and GE urged DOE to consider TSL 1 from the October 2008 NOPR (1.42 MEF/9.5 WF) as the appropriate standard for top-loading CCWs. (Alliance, Public Meeting Transcript, No. 40.5 at pp. 23–24; GE No. 48 at p. 5) Alliance believes that TSL 1 would result in energy savings while being technically feasible and economically justified. Alliance also stated standards at TSL 1 would avoid or lessen harm to Alliance and, hence,

reduce significant consumer impacts that would be associated with Alliance likely ceasing production. (Alliance, No. 45 at Attachment 2, p. 18)

GE opposed the top-loading standard proposed in the October 2008 NOPR due to small market size (1.3 percent) for coin-operated, top-loading CCWs and the potential 31-percent decrease in industry cash flows due to the proposed standards. GE commented that adoption of the standards would essentially regulate the top-loading equipment class out of the marketplace. GE also stated that the max-tech level for top-loading CCWs is not yet justified as being sustainable in the harsher consumer environment of laundromats, where units are subject to much tougher conditions such as overloading. GE agreed with Alliance's proposed standards for top-loaders of TSL 1 from the October 2008 NOPR (1.42 MEF/9.5 WF), which would also make the CCW WF consistent with the EISA 2007 standards for RCWs. (GE, Public Meeting Transcript, No. 40.5 at pp. 31–32; GE, No. 48 at pp. 4–5) MLA opposed the proposed October 2008 NOPR standard for top-loading CCWs, because there is currently no commercially acceptable top-loading CCW that can meet it. MLA believes the only way to comply with the top-loading CCW standard proposed in the October 2008 NOPR is to produce machines with poor washing and rinsing performance, high maintenance costs, and increased manufacturing costs. (MLA, No. 49 at pp.1 and 4)

Whirlpool commented that it supports both the proposed top-loading and front-loading standards in the October 2008 NOPR, though it acknowledged industry support is not consistent. Both standards, it said, are technologically feasible and enable substantial water and energy savings, although it agreed with DOE that front-loading CCWs can reach efficiency levels generally not attainable by top-loaders. Whirlpool stated that it has yet to field a top-loading CCW that can meet the proposed October 2008 NOPR standard, but that it believes technology exists to develop such equipment by early 2012 without violating intellectual property, provided that engineering and capital resources are available. (Whirlpool, Public Meeting Transcript, No. 40.5 at p. 28; Whirlpool, No. 50 at pp. 2–3) Whirlpool identified risks associated with the standards proposed in the October 2008 NOPR, including higher unit, capital, and development costs; lower reliability or perceived reliability due to the complexity of the technology needed to meet the standard; lack of market acceptance for lid locks on top-loading CCWs using spray rinse technology to meet the standard; and durability and resistance to breakage under overloading conditions. (Whirlpool, No. 50 at p. 3)

PG&E and EJ stated that adopting a single standard for all CCW classes would result in the largest potential savings for consumers. (EJ, Public Meeting Transcript, No. 40.5 at p. 200; PG&E, Public Meeting Transcript, No. 40.5 at p. 201) The Joint Comment suggested that a single standard based on efficiency achieved by front loaders available in the market today would achieve 32 percent more energy savings, 192 percent more water savings, and 78 percent more consumer savings in present value terms than the standards proposed in the October 2008 NOPR that treat top-loading and front-loading CCWs separately. (Joint Comment, No. 44 at p. 1)

ASAP commented that the previous analyses leading up to the October 2008 NOPR [the analyses in the November 2007 ANOPR] clearly indicated that there are tremendous life-cycle cost savings presented by high-efficiency CCWs, and those are available to all sectors of the market. ASAP believes that, for what appears to be a lack of a relatively small amount of capital, recognizing that amount of capital is significant for one manufacturer, hundreds of millions of dollars of consumer savings are going to be foregone. ASAP also commented that DOE did not substantiate its concerns about potential recapture of market share by less efficient top-loaders when reducing the proposed standard for front-loading CCWs from the level that would maximize life-cycle cost savings to the standards proposed in the October 2008 NOPR. (ASAP, Public Meeting Transcript, No. 40.5 at pp. 34–35)

In considering standards for today's supplemental notice, DOE first notes that it has retained separate equipment classes for top-loading and front-loading CCWs, for reasons discussed in section III.A. For top-loading CCW standards, DOE has revised its analysis due to a re-evaluation of the max-tech efficiency level, which resulted in the max-tech level from the October 2008 NOPR being eliminated from consideration as an efficiency level for today's supplemental notice (see section III.C.1.a.) DOE did not change the engineering analysis for front-loading CCWs from those presented in the October 2008 NOPR. DOE has thus evaluated standards for both equipment classes, including impacts to the consumer, manufacturer, and Nation, based on the analyses outlined in section III, and presents the approach and results for proposed standard levels for today's SNOPR in section V.

V. Analytical Results

A. Trial Standard Levels

DOE analyzed the benefits and burdens of a number of TSLs for the CCWs that are the subject of today's supplemental proposed rule. As discussed in section IV.A, for the October 2008 NOPR, DOE based the TSLs on efficiency levels explored in the November 2007 ANOPR, and selected the TSLs on consideration of economic factors and current market conditions. As also discussed previously in section III.C.1.a, DOE eliminated the maximum technologically efficiency level of 1.76 MEF/8.3 WF for the top-loading equipment class. Accordingly, for today's supplemental proposed rule, DOE modified the TSLs it considered for the October 2008 NOPR.

Table V.1 shows the TSLs for CCWs. TSLs consist of a combination of MEF and WF for each equipment class. In all, DOE has considered five TSLs. TSL 1 corresponds to the first candidate standard level from each equipment class and represents the efficiency level for each class with the least significant design change. TSL 2 represents the second candidate standard level for front-loading washers while keeping top-loading washers at its first candidate standard level. Over 96 percent of the front-loading CCW equipment Stock Keeping Units (SKUs) currently on the market either meets or exceeds the second candidate standard level for front-loading washers. In the case of the second candidate standard level for top-loading washers, a significant percent of the market, over 35 percent, also meets or exceeds this efficiency level. Therefore, TSL 2 corresponds to the candidate standard levels for each equipment class that still represent a significant share of the market. TSL 3 represents the second candidate standard level for top-loading washers (the maximum efficiency level for this class), and keeps front-loading washers at the second candidate standard level. For TSL 3, front-loading washers were held to the second candidate standard level in order to minimize the equipment price difference between the two equipment classes. For TSL 4, top-loading washers are retained at their maximum efficiency level while front-loading washers are incremented to their third candidate standard level. Finally, TSL 5 corresponds to the maximum technologically feasible level for each equipment class. In progressing

from TSL 1 to TSL 5, the LCC savings, NES, and NPV all increase. TSL 5 represents the level with the minimum LCC and maximum NES and NPV.

TABLE V.1—TRIAL STANDARD LEVELS FOR COMMERCIAL CLOTHES WASHERS

	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5
Top-Loading:					
MEF	1.42	1.42	1.60	1.60	1.60
WF	9.5	9.5	8.5	8.5	8.5
Front-Loading:					
MEF	1.80	2.00	2.00	2.20	2.35
WF	7.5	5.5	5.5	5.1	4.4

B. Economic Justification and Energy Savings

1. Economic Impacts on Consumers

a. Life-Cycle Cost and Payback Period

To evaluate the net economic impact of standards on consumers, DOE conducted LCC and PBP analyses for each TSL. In general, higher efficiency equipment would affect consumers in two ways: (1) Annual operating expense would decrease; and (2) purchase price would increase. Section III.D of this notice discusses the inputs DOE used for calculating the LCC and PBP.

The key outputs of the LCC analysis are a mean LCC savings relative to the baseline equipment design, as well as a probability distribution or likelihood of LCC reduction or increase, for each TSL and equipment class. The LCC analysis also estimates the fraction of consumers for which the LCC will decrease (net benefit), increase (net cost), or exhibit no change (no impact) relative to the base-case equipment forecast. No impacts occur when the equipment efficiencies of the base-case forecast already equal or exceed the considered TSL efficiency.

Table V.2 and Table V.3 show the LCC and PBP results for both CCW equipment applications for the top-loading class while Table V.4 and Table V.5 show the LCC and PPB results for the front-loading equipment class. For example, in the case of the multi-family application for front-loading washers (Table V.4), TSL 2 (2.00 MEF/5.50 WF) shows an average LCC savings of $19. Note that for TSL 2, 96.3 percent of consumers in 2013 are assumed to already be using a front-loading CCW in the base case at TSL 2 and, thus, have zero savings due to the standard. If one compares the LCC of the baseline at 1.72 MEF/8.00 WF ($4220) to TSL 2 ($3690), then the difference in the LCCs is $530. However, since the base case includes a significant number of consumers that are not impacted by the standard, the average savings over all of the consumers is actually $19, not $530. DOE determined the median and average values of the PBPs shown below by excluding the percentage of households not impacted by the standard. For example, in the case of TSL 2 for front-loading washers in a multi-family application, 96.3 percent of the consumers did not factor into the calculation of the median and average PBP.

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Table V.2 Commercial Clothes Washers, Top-Loading, Multi-Family Application: Life-Cycle Cost and Payback Period Results

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.26/9.50	$760	$3,263	$4,023	-	-	-	-	-	-
1, 2	1.42/9.50	$883	$3,153	$4,036	-$8.1	43.3%	35.3%	21.5%	11.7	17.3
3, 4, 5	1.60/8.50	$974	$2,873	$3,847	$178.6	13.8%	1.2%	85.0%	4.6	5.6

Table V.3 Commercial Clothes Washers, Top-Loading, Laundromat Application: Life-Cycle Cost and Payback Period Results

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.26/9.50	$760	$3,422	$4,182	-	-	-	-	-	-
1, 2	1.42/9.50	$883	$3,326	$4,209	-$17.7	51.4%	35.3%	13.3%	7.9	9.1
3, 4, 5	1.60/8.50	$974	$3,025	$3,999	$190.0	2.9%	1.2%	95.9%	2.8	3.0

Table V.4 Commercial Clothes Washers, Front-Loading, Multi-Family Application: Life-Cycle Cost and Payback Period Results

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.72/8.00	$1,365	$2,855	$4,220	-	-	-	-	-	-
1	1.80/7.50	$1,365	$2,855	$4,091	$4.7	0.0%	96.3%	3.7%	0.0	0.0
2, 3	2.00/5.50	$1,388	$2,726	$3,690	$19.5	0.0%	96.3%	3.7%	0.4	0.4
4	2.20/5.10	$1,428	$2,302	$3,596	$91.5	1.4%	23.1%	75.5%	3.0	3.2
5	2.35/4.40	$1,470	$2,168	$3,484	$202.7	1.1%	0.0%	98.9%	2.9	3.1

Table V.5 Commercial Clothes Washers, Front-Loading, Laundromat Application: Life-Cycle Cost and Payback Period Results

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.72/8.00	$1,365	$2,014	$4,380	-	-	-	-	-	-
1	1.80/7.50	$1,365	$3,014	$4,240	$5.2	0.0%	96.3%	3.7%	0.0	0.0
2, 3	2.00/5.50	$1,388	$2,874	$3,787	$22.0	0.0%	96.3%	3.7%	0.2	0.2
4	2.20/5.10	$1,428	$2,400	$3,695	$93.4	0.0%	23.1%	76.9%	1.8	1.9
5	2.35/4.40	$1,470	$2,267	$3,572	$216.1	0.0%	0.0%	100.0%	1.6	1.7

b. Consumer Subgroup Analysis

Using the LCC spreadsheet model, DOE determined the impact of the standards on the following CCW consumer subgroups: small business owners and consumers without municipal water and sewer.

The results for consumers without municipal water and sewer indicate that the LCC impacts and payback periods for this subgroup are similar to the LCC impacts and payback periods on the full sample of CCW consumers. But for small business owners, the LCC impacts and payback periods are different from those associated with the general population. For the top-loading equipment class, Table V.6 and Table V.7 show the LCC impacts and payback periods for small multi-family property owners and small laundromats, respectively, while Table V.8 and Table V.9 show the same but for the front-loading equipment class. For all TSLs for both equipment classes, both sets of small business owners, on average, realize LCC savings similar to the general population. The difference between the small business population and the general population occurs in the percentage of each population that realizes LCC savings from standards. With the exception of TSL 1 for top-loading washers, an overwhelming majority of the small business and general populations benefit from standards at each TSL. But for both equipment classes, a larger percentage of the general population benefits from standards than small business owners. This occurs because small businesses do not have the same access to capital as larger businesses. As a result, smaller businesses have a higher average discount rate than the industry average. Because of the higher discount rates, smaller businesses do not value future operating costs savings from more efficient CCWs as much as the general population. But to emphasize, in spite of the higher discount rates, a majority of small businesses still benefit from higher CCW standards at all TSLs, with the exception of TSL 1 for the top-loading equipment class.

Table V.6 Commercial Clothes Washers, Top-Loading, Multi-Family Application: Life-Cycle Cost and Payback Period Results for Small Business Owners

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.26/9.50	$760	$2,659	$3,419						
1, 2	1.42/9.50	$883	$2,569	$3,452	-$22.0	50.7%	35.6%	13.7%	11.7	17.7
3, 4, 5	1.60/8.50	$974	$2,341	$3,315	$112.6	21.2%	1.5%	77.4%	4.5	5.6

Table V.7 Commercial Clothes Washers, Top-Loading, Laundromat Application: Life-Cycle Cost and Payback Period Results for Small Business Owners

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.26/9.50	$760	$2,963	$3,723						
1, 2	1.42/9.50	$883	$2,880	$3,764	-$26.1	58.6%	35.6%	5.8%	7.8	9.2
3, 4, 5	1.60/8.50	$974	$2,620	$3,594	$140.9	5.6%	1.5%	92.9%	2.8	3.0

Table V.8 Commercial Clothes Washers, Front-Loading, Multi-Family Application: Life-Cycle Cost and Payback Period Results for Small Business Owners

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.72/8.00	$1,365	$2,327	$3,693						
1	1.80/7.50	$1,365	$2,327	$3,587	$3.7	0.0%	96.4%	3.6%	0.0	0.0
2, 3	2.00/5.50	$1,388	$2,222	$3,265	$14.9	0.0%	96.4%	3.6%	0.4	0.5
4	2.20/5.10	$1,428	$1,877	$3,196	$69.1	4.1%	22.2%	73.7%	3.0	3.2
5	2.35/4.40	$1,470	$1,768	$3,113	$151.7	4.2%	0.0%	95.8%	2.9	3.1

Table V.9 Commercial Clothes Washers, Front-Loading, Laundromat Application: Life-Cycle Cost and Payback Period Results for Small Business Owners

		Life-Cycle Cost			Life-Cycle Cost Savings				Payback Period (years)	
						Households with				
TSL	MEF/WF	Average Installed Price	Average Operating Cost	Average LCC	Average Savings	Net Cost	No Impact	Net Benefit	Median	Average
Baseline	1.72/8.00	$1,365	$1,643	$3,977						
1	1.80/7.50	$1,365	$2,611	$3,855	$4.2	0.0%	96.4%	3.6%	0.0	0.0
2, 3	2.00/5.50	$1,388	$2,490	$3,467	$17.6	0.0%	96.4%	3.6%	0.2	0.2
4	2.20/5.10	$1,428	$2,079	$3,392	$75.9	0.0%	22.2%	77.7%	1.8	1.9
5	2.35/4.40	$1,470	$1,964	$3,291	$176.4	0.0%	0.0%	100.0%	1.6	1.7

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c. Rebuttable-Presumption Payback

As discussed above, EPCA establishes a rebuttable presumption that an energy conservation standard is economically justified if the increased purchase cost for equipment that meets the standard is less than three times the value of the first-year energy savings resulting from the standard. (42 U.S.C. 6295(o)(2)(B)(iii)) DOE calculated a rebuttable-presumption payback period for each TSL to determine whether DOE could presume that a standard at that level is economically justified. Table V.10 shows the rebuttable-presumption payback periods for CCWs. Because only a single, average value is necessary for establishing the rebuttable-presumption payback period, rather than using distributions for input values, DOE used discrete values. As required by EPCA, DOE based the

calculation on the assumptions in the DOE test procedures for CCWs. (42 U.S.C. 6295(o)(2)(B)(iii)) As a result, DOE calculated a single rebuttable-presumption payback value, and not a distribution of payback periods, for each TSL.

TABLE V.10—REBUTTABLE-PRESUMPTION PAYBACK PERIODS FOR COMMERCIAL CLOTHES WASHERS

TSL	Payback period, *years*			
	Top-loading		Front-loading	
	Multi-family application	Laundromat application	Multi-family application	Laundromat application
1	>100	>100	0	0
2	>100	>100	1.2	1.3
3	24.0	>100	1.2	1.3
4	24.0	>100	9.4	17.3
5	24.0	>100	10.0	17.6

With the exception of TSLs 1 to 3 for front-loading CCWs, the TSLs in Table V.10 do not have rebuttable-presumption payback periods of less than 3 years. As stated above, in addition to calculating the rebuttable-presumption payback period DOE routinely conducts a thorough economic analysis that considers the full range of impacts, including those to consumers, manufacturers, the Nation, and the environment, as required under 42 U.S.C. 6295(o)(2)(B)(i). The results of this full analysis serve as the basis for DOE to definitively determine the economic justification for a potential standard level (thereby supporting or rebutting the results of any preliminary determination of economic justification). Section V.C provides a complete discussion of how DOE considered the range of impacts to select the standards proposed in today's SNOPR.

2. Economic Impacts on Manufacturers

For the October 2008 NOPR, DOE used the INPV in the MIA to compare the financial impacts of different TSLs on CCW manufacturers. 73 FR 62034, 62099–104 (Oct. 17, 2008). The INPV is the sum of all net cash flows discounted by the industry's cost of capital (discount rate). DOE used the GRIM to compare the INPV of the base case (no new energy conservation standards) to that of each TSL for the CCW industry. To evaluate the range of cash-flow impacts on the CCW industry, DOE constructed different scenarios using different assumptions for shipments that correspond to the range of anticipated market responses. Each scenario results in a unique set of cash flows and corresponding industry value at each TSL. These steps allowed DOE to compare the potential impacts on the industry as a function of TSLs in the GRIM. The difference in INPV between the base case and the standards case is an estimate of the economic impacts that implementing that standard level would have on the entire industry. For today's supplemental notice, DOE continues to use the above methodology and presents the results in the subsequent sections. See chapter 13 for additional information on MIA methodology and results.

a. Industry Cash-Flow Analysis Results

The major source of uncertainty voiced by all manufacturers during MIA interviews is the impact of higher standards on the number of CCWs sold. Future equipment sales are particularly important considering the high capital costs (particularly design, tooling, and product verification costs) on the basis of the low volumes of equipment sold. In light of the concern over future shipments, DOE modeled two MIA scenarios, based on two shipment projections from the NIA.

To assess the lower end of the range of the potential impacts on the CCW industry, DOE considered a scenario in which total CCW shipments will not be negatively impacted at higher energy conservation standards; this scenario is called the base-case shipments scenario. To assess the higher end of the range of potential impacts for the CCW industry, DOE considered a scenario in which total industry shipments would decrease due to the combined effects of increases in purchase price and decreases in operating costs due to new energy conservation standards; this scenario is called the price elasticity of demand scenario. In both scenarios, it is assumed that manufacturers will be able maintain the same gross margins (as a percentage of revenues) that are currently obtained in the base case.

As discussed in section III.G of today's supplemental notice, DOE also considered the impact of Federal production tax credits on the CCW industry. DOE does not include the benefit of these tax credits in its results shown below. DOE includes these results in appendix 13C of the TSD. DOE estimated that the total benefit of these Federal production tax credits to the CCW industry from 2007 through 2010 would be approximately $4.1 million. Because DOE discounts the industry cash flows to the 2009 base year, in this scenario the base case INPV increases by approximately $400,000 if the benefit from the Federal production tax credits are included. As previously stated, although the base-case and standards-case INPV increase as a result of Federal production tax credits, the benefits do not significantly mitigate possible impacts due to standards. For additional information on the assumptions and calculations of Federal production tax credits for CCWs, see appendix 13C of the TSD.

Table V.11 and Table V.12 show the MIA results for each TSL using both shipment scenarios described above for CCW manufacturers.

Table V.11 Manufacturer Impact Analysis for Commercial Clothes Washers with Base-Case Shipments (Not Including DOE's Estimates of Federal Production Tax Credits)

Preservation of Gross Margin Percentage Markup with Base-Case Shipments							
	Units	Base Case	Trial Standard Level				
			1	2	3	4	5
INPV	(2008$ millions)	62	65	63	57	54	41
Change in INPV	(2008$ millions)*	-	4	1	(5)	(8)	(20)
	(%)	-	5.97%	2.24%	-7.81%	-12.73%	-33.09%
Amended Energy Conservation Standards Equipment Conversion Expenses	(2008$ millions)	-	0.00	3.12	18.72	22.56	35.87
Amended Energy Conservation Standards Capital Investments	(2008$ millions)	-	0.00	0.62	1.66	2.44	5.09
Total Investment Required	(2008$ millions)	-	0.0	3.7	20.4	25.0	41.0

*Parentheses indicate negative (-) values

Table V.12 Manufacturer Impact Analysis for Commercial Clothes Washers with Price Elasticity of Demand Shipments (Not Including DOE's Estimates of Federal Production Tax Credits)

Preservation of Gross Margin Percentage Markup with Price Elasticity of Demand Shipments							
	Units	Base Case	Trial Standard Level				
			1	2	3	4	5
INPV	(2008$ millions)	62	64	62	55	51	39
Change in INPV	(2008$ millions)*	-	2.8	0.5	(7.0)	(10.2)	(23.0)
	(%)	-	4.50%	0.76%	-11.39%	-16.57%	-37.30%
Amended Energy Conservation Standards Equipment Conversion Expenses	(2008$ millions)	-	0.00	3.12	18.72	22.56	35.87
Amended Energy Conservation Standards Capital Investments	(2008$ millions)	-	0.00	0.62	1.66	2.44	5.09
Total Investment Required	(2008$ millions)	-	0.0	3.7	20.4	25.0	41.0

*Parentheses indicate negative (-) values

At TSL 1, the impact on INPV and cash flow varies depending on the manufacturers' ability to maintain revenues as shipments decrease due to the price elasticity. DOE estimated the impacts in INPV at TSL 1 to range from positive $3.7 million to positive $2.8 million, or a change in INPV of 5.97 percent to 4.50 percent. At this level, the industry cash flow does not decrease from the base-case value of $3.8 million in the year leading up to the standards. Since all manufacturers currently make or source top-loading and front-loading CCWs with efficiency levels above this level, DOE assumed that there would be no equipment or capital conversion costs.

At TSL 2, DOE estimated the impacts in INPV to range from positive $1.4 million to positive $0.5 million, or a change in INPV of 2.24 percent to 0.76 percent. At this level, the industry cash flow decreases by approximately 27.7 percent, to $2.8 million, compared to the base-case value of $3.8 million in the year leading up to the standards. Since all manufacturers of top-loading washers already sell equipment that exceeds the efficiency requirements proposed at this TSL, DOE assumed that there would be no equipment or capital conversion costs for top-loading washers at this TSL. Over 95 percent of all currently-sold front-loading CCW SKUs have efficiency levels that achieve or exceed this level and all manufacturers sell front-loading washers that achieve or exceed this level. Accordingly, DOE estimated that the industry would incur relatively small equipment and capital conversion costs at this TSL.

At TSL 3, DOE estimated the impacts in INPV to range from −$4.8 million to −$7.0 million, or a change in INPV of −7.81 percent to −11.39 percent. At this level, the industry cash flow decreases by approximately 158 percent, to −$2.2 million, compared to the base case value of $3.8 million in the year leading up to the standards. Only one manufacturer currently markets a single top-loading CCW SKU at this TSL. DOE estimates that at least one manufacturer will need to redesign and retool a line of top-loading CCWs to meet the efficiency requirements of TSL 3. For top-loading CCWs, multiple manufacturers stated that customers could see a reduction in wash quality or reject new designs based on a perceived reduction in wash quality or rinse performance at TSL 3. Over 95 percent of currently-sold front-loading CCW SKUs have efficiency ratings that meet or exceed this level. Hence, DOE estimated relatively small equipment and capital conversion costs for these washers.

At TSL 4, DOE estimated the impacts in INPV at TSL 4 to range from −$7.8 million to −$10.2 million, or a change in INPV of −12.73 percent to −16.57 percent. At this level, the industry cash flow decreases by approximately 206 percent, to −$4.1 million, compared to the base-case value of $3.8 million in the year leading up to the standards. As with TSL 3, the top-loading standard remains at max-tech at TSL 4, and the impacts previously stated for this equipment class remain. Currently, 77 percent of front-loading washers shipped do not meet TSL 4, resulting in multiple manufacturers having to redesign existing front-loading equipment to conform cost-effectively to the standard. The $8.4 million in equipment and capital conversion costs estimated for this TSL to redesign and retool for the front-loading standard, while not appearing substantial on a nominal basis, are significant for manufacturers due to low volumes of front-loading washers. Adjusting for shipment volumes, investing $8.4 million in front-loading washers is equivalent to investing over $18.5

million in top-loading washers. These investment costs are also high compared to the industry value of $29 million for front-loading washers. Consequently, it could be difficult for manufacturers to justify the investments necessary to reach TSL 4 for front-loading washers.

At TSL 5, DOE estimated the impacts in INPV to range from −$20.4 million to −$23.0 million, or a change in INPV of −33.09 percent to −37.30 percent. At this level, the industry cash flow decreases by approximately 371 percent, to −$10.3 million, compared to the base-case value of $3.8 million in the year leading up to the standards. The top-loading standard remains at max-tech at TSL 5. DOE estimates for TSL 5 that manufacturers would have to invest $24.4 million in front-loading washer in an industry valued at $29 million. It likely would be difficult for manufacturers to justify the investments necessary to reach max-tech for both top-loading and front-loading washers.

b. Impacts on Employment

To quantitatively assess the impacts of energy conservation standards on CCW manufacturing employment, DOE used the GRIM to estimate the domestic labor expenditures and number of employees in the base case and at each TSL from 2009 through 2043 for the CCW industry. DOE used statistical data from the U.S. Census Bureau's 2006 *Annual Survey of Manufactures*[36] (*2006 ASM*) and 2006 *Current Industry Report*[37] (*2006 CIR*), the results of the engineering analysis, and interviews with manufacturers to estimate the inputs necessary to calculate industry-wide labor expenditures and domestic employment levels. Labor expenditures are a function of the labor intensity of the equipment, the sales volume, and an implicit assumption that wages remain fixed in real terms over time. DOE notes that the MIA's analysis detailing impacts on employment focuses specifically on the production workers manufacturing the covered products or equipment, rather than a manufacturer's broader operations. Thus, the estimated number of impacted employees in the MIA is separate and distinct from the total number of employees used to determine whether a manufacturer is a small business for purposes of analysis under the Regulatory Flexibility Act.

The estimates of production workers in this section only cover workers up to and including the line-supervisor level that are directly involved in fabricating and assembling equipment within the original equipment manufacturer (OEM) facility. In addition, workers that perform services that are closely associated with production operations are included. Employees above the working-supervisor level are excluded from the count of production workers. Thus, the labor associated with non-production functions (*e.g.,* advertisement, sales) is explicitly not covered.[38] In addition, DOE's estimates only account for production workers that manufacture the specific equipment covered by this rulemaking. For example, a worker on a clothes dryer production line would not be included in the estimate of the number of CCW production workers. Finally, this analysis also does not factor in the dependence by some manufacturers on production volume to make their operations viable. For example, should a major line of business cease to operate or move to a geographic region, a production facility may no longer have the manufacturing scale to obtain volume discounts on its purchases nor be able to justify maintaining major capital equipment. Thus, the impact on a manufacturing facility due to a line closure may affect more employees than just the production workers, but again this analysis focuses on the production workers directly impacted.

Using the GRIM, DOE calculates that there are 188 U.S. production workers in the CCW industry. Using the *CIR* data, DOE estimates that approximately 81 percent of CCWs sold in the United States are manufactured domestically. Today's supplemental notice estimates the impacts on U.S. production workers in the CCW industry impacted by energy conservation standards as shown in Table V.13.

TABLE V.13—CHANGE IN TOTAL NUMBER OF DOMESTIC PRODUCTION EMPLOYEES IN 2012 IN THE COMMERCIAL CLOTHES WASHER INDUSTRY

	Baseline	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5
Total Number of Domestic Production Workers in 2012	188	204	204	222	224	228
Change in Total Number of Domestic Production Workers in 2012		16	16	33	36	40

DOE expects that there would be positive employment impacts among domestic CCW manufacturers for TSL 1 through TSL 5. Because production employment expenditures are assumed to be a fixed percentage of COGS and the MPCs increase with more efficient equipment, labor tracks the increased prices in the GRIM. The GRIM predicts a steady level of domestic employment after standards at a level based on the increase in relative price.

DOE reached this conclusion independent of the employment impacts from the broader U.S. economy, which are documented in chapter 15 of the TSD accompanying this notice. The employment conclusions do not account for the possible relocation of domestic jobs to lower-labor-cost countries because the potential relocation of U.S. jobs is uncertain and highly speculative. The GRIM shows the employment levels rising at higher TSLs. If all standards-compliant CCWs are produced in the United States, the employment levels would be expected to be reasonably accurate, as more efficient washers are more complex and require more labor.

The actual impacts on domestic employment after standards depend on whether any U.S. manufacturer decided to shift more U.S. production to lower-cost countries. Due to the uncertainty in the business decisions of where to manufacture washers after standards, DOE presents a range of potential employment impacts if the potential for relocation is considered. Today's proposed standards could result in adding 33 production workers (if all manufacturers continue to produce washers in their existing U.S. facilities) to losing 188 production workers (if all

[36] The 2006 *Annual Survey of Manufactures* is available online at: *http://www.census.gov/mcd/asmhome.html.*

[37] The 2006 *Current Industry Report* is available online at: *http://www.census.gov/cir/www/alpha.html.*

[38] The 2006 *ASM* provides the following definition: ''The 'production workers' number includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (*e.g.,* power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.''

U.S. manufacturers source or shift standards-compliant washers production abroad).

Based on the CCW revenues reported in appendix 13A and using the employment assumptions in section III.H, DOE estimates there are approximately 150 production workers at the LVM manufacturing equipment directly covered by this rulemaking. DOE estimates that there are an additional 20 non-production employees attributable to CCWs at the facility. The domestic facility also manufactures residential top-loading washers, standard dryers, front-loading residential washers, washer-extractors, and tumbler dryers. If the LVM decided to no longer produce any soft-mount washers or standard dryers at the facility because it could not sell dryers without selling washers, approximately 292 production and 40 non-production jobs would be lost. Including all production workers involved in covered and non-covered equipment, the closure of the LVM domestic manufacturing plant would equate to a loss of approximately 600 factory employees.

A further discussion of the LVM and the potential impacts of relocation on employment for the CCW industry at other TSLs are presented in chapter 13 of the TSD.

c. Impacts on Manufacturing Capacity

According to the majority of CCW manufacturers, new energy conservation standards could potentially impact manufacturers' production capacity depending on the efficiency level required. Necessary redesigns of front-loading and top-loading CCWs will not change the fundamental assembly of the equipment or cause a drastic increase in the volume requirements of front-loading washers. Thus, DOE believes manufacturers will be able to maintain manufacturing capacity levels and continue to meet market demand under new energy conservation standards as long as manufacturers continue to offer top-loading and front-loading washers.

However, a very high efficiency standard for top-loading clothes washers could potentially cause one or more manufacturer(s) to abandon further manufacture of top-loading clothes washers after the effective date (due to concerns about wash quality, for example). Instead of manufacturing top-loading clothes washers, manufacturers could elect to switch their entire production over to front-loading clothes washers. Since top-loading and front-loading clothes washers share few, if any parts, are built on completely separate assembly lines, and are built at very different production volumes, a manufacturer may not be able to make a platform switch from top-loading to front-loading washers without significant impacts on equipment development and capital expenses, along with capacity constraints. However, DOE believes that the energy conservation standard proposed in today's supplemental notice for top-loading CCWs mitigates much of that risk.

Multiple manufacturers stated during interviews that front-loading CCWs represent a relatively small segment of their total production volumes. Depending on the manufacturer, front-loading production capacity may need to be substantially expanded to meet the demand that top-loading production lines currently meet. This expansion could possibly affect capacity until new production lines come on-line to service demand. In addition, manufacturers stated that the higher prices of front-loading washers could lead to a decrease in shipments. This could lead to a permanently lower production capacity as machines are repaired and the equipment lifetime of existing washers is extended. DOE research suggests that the proposed efficiency standards can be achieved by all manufacturers using existing platforms and technologies; hence, there appears little reason for the market to wholly transition to front-loading CCWs.

d. Impacts on Subgroups of Manufacturers

Using average cost assumptions to develop an industry cash flow estimate is not adequate for assessing differential impacts among subgroups of manufacturers. Lower-volume manufacturers, niche players, or manufacturers exhibiting a cost structure that differs significantly from the industry average could be affected differently than their competitors. DOE used the results of the industry characterization to group manufacturers exhibiting similar characteristics.

As outlined earlier, an LVM that concentrates on building laundry equipment will be affected disproportionately by any energy efficiency regulation regarding CCWs. This business is focused on the commercial laundry market segment and its total production volume is many times lower than its diversified competitors. Due to this combination of market concentration and size, it is at risk of material harm to its business, depending on the TSL chosen.

The LVM indicated that it could not manufacture top-loading CCWs above an MEF of 1.42 (TSL 1). If DOE sets a standard above TSL 1, the LVM would be forced to design a new top-loading washer, offer only front-loading washers, or choose to exit the CCW market altogether. Due to its small size, the investment required for the LVM to design a more efficient top-loading washer would put the company at a competitive disadvantage. If the LVM no longer were to offer a top-loading washer and would have to expand its front-loading production lines, it would likely cease CCW production altogether, resulting in significant impacts to the industry. Currently, the LVM's top-loading washers account for 70 percent of its CCW shipments. Shifting all top-loading CCWs to front-loading washers at current production volumes would require substantial investments that the company may not be able to justify. In addition, the LVM historically derived over 85 percent of its total clothes washer revenue from CCWs, so its sales in the RCW market would be too low to justify continuing any top-loading clothes washer manufacturing. While the LVM currently manufactures a front-loading clothes washer, it does so at a cost disadvantage compared to its competitors. The potential investment and risk required to develop a cost-competitive clothes washer that deviates significantly from its traditional top-loader agitator design could be too great for the LVM's current owners. The LVM could decide to exit the market rather than take this risk, which could cause employment impacts in the CCW industry. As stated in section III.G, DOE reevaluated the CCW energy conservation standards proposed in the October 2008 NOPR in response to comments received from interested parties. DOE believes that the energy conservation standards proposed in today' supplemental notice greatly lessens the potential disadvantages faced by the LVM. Further details of the separate analysis of the impacts on the LVM are found in chapter 13 of the TSD accompanying this supplemental notice.

3. National Impact Analysis

a. Significance of Energy Savings

To estimate the energy savings through 2043 that would be expected to result from amended energy conservation standards, DOE compared the energy consumption of equipment under the base case to energy consumption of this equipment under the TSLs. Table V.14 shows the forecasted national energy savings at each TSL for CCWs. Summing the energy savings for all equipment classes across each TSL considered in this rulemaking would result in significant energy and water savings, with the

amount of savings increasing with higher efficiency standards. Chapter 11 of the TSD accompanying this supplemental notice provides additional details on the NES values reported below, as well as discounted NES results (and discounted national water savings results) based on discount rates of 3 and 7 percent. DOE reports both undiscounted and discounted values of energy savings. Discounted energy savings represent a policy perspective wherein energy savings farther in the future are less significant than energy savings closer to the present.[39]

TABLE V.14—SUMMARY OF CUMULATIVE NATIONAL ENERGY AND WATER SAVINGS FOR COMMERCIAL CLOTHES WASHERS

TSL	Top-loading		Front-loading		Total	
	National energy savings (quads)	National water savings (trillion gallons)	National energy savings (quads)	National water savings (trillion gallons)	National energy savings (quads)	National water savings (trillion gallons)
1	0.04	0.00	0.00	0.00	0.04	0.00
2	0.04	0.00	0.00	0.01	0.04	0.01
3	0.10	0.14	0.00	0.01	0.10	0.14
4	0.10	0.14	0.01	0.03	0.11	0.16
5	0.10	0.14	0.02	0.07	0.12	0.21

b. Net Present Value

The NPV analysis is a measure of the cumulative benefit or cost of energy conservation standards to the Nation. In accordance with the OMB's guidelines on regulatory analysis (OMB Circular A–4, section E, Sept. 17, 2003), DOE calculated NPV using both a 7-percent and a 3-percent real discount rate. The 7-percent rate is an estimate of the average before-tax rate of return on private capital in the U.S. economy, and reflects the returns on real estate and small business capital as well as corporate capital. DOE used this discount rate to approximate the opportunity cost of capital in the private sector, since recent OMB analysis has found the average rate of return to capital to be near this rate. DOE also used the 3-percent rate to capture the potential effects of standards on private consumption (*e.g.,* through higher prices for equipment and the purchase of reduced amounts of energy). This rate represents the rate at which society discounts future consumption flows to their present value. This rate can be approximated by the real rate of return on long-term government debt (*i.e.,* yield on Treasury notes minus annual rate of change in the Consumer Price Index), which has averaged about 3 percent on a pre-tax basis for the last 30 years. Table V.15 shows the forecasted NPV at each TSL for CCWs.

TABLE V.15—SUMMARY OF CUMULATIVE NET PRESENT VALUE FOR COMMERCIAL CLOTHES WASHERS

[Impacts for units sold from 2013 to 2043]

TSL	NPV (billion 2008$)					7% Discount rate
	Top-loading		Front-loading		Total	
	7% Discount rate	3% Discount rate	7% Discount rate	3% Discount rate		
1	0.01	0.07	0.00	0.01	0.01	0.08
2	0.01	0.07	0.01	0.03	0.02	0.10
3	0.34	0.86	0.01	0.03	0.36	0.89
4	0.34	0.86	0.07	0.17	0.41	1.03
5	0.34	0.86	0.17	0.39	0.51	1.25

c. Impacts on Employment

In addition to considering the direct employment impacts for the manufacturers of equipment covered by this rulemaking (discussed above), DOE develops estimates of the indirect employment impacts of proposed standards in the economy in general. As noted previously, DOE expects energy conservation standards for equipment subject of this rulemaking to reduce energy bills for consumers, with the resulting net savings being redirected to other forms of economic activity. DOE also realizes that these shifts in spending and economic activity could affect the demand for labor. To estimate these effects, DOE used an input/output model of the U.S. economy using BLS data (described in section III.H). (See the TSD accompanying this supplemental notice, chapter 15.)

This input/output model suggests today's proposed standards are likely to slightly increase the net demand for labor in the economy. Neither the BLS data nor the input/output model DOE uses includes the quality or wage level of the jobs. As Table V.16 shows, DOE estimates that net indirect employment impacts from today's proposed standards are likely to be small. The net increase in jobs is so small that it would be imperceptible in national labor statistics and might be offset by other, unanticipated effects on employment.

[39] Consistent with Executive Order 12866, ''Regulatory Planning and Review,'' 58 FR 51735 (Oct. 4, 1993), DOE follows the guidance of OMB regarding methodologies and procedures for regulatory impact analysis that affect more than one agency. In reporting energy and environmental benefits from energy conservation standards, DOE will report both discounted and undiscounted (*i.e.,* zero discount-rate) values.

TABLE V.16—NET NATIONAL CHANGE IN INDIRECT EMPLOYMENT AT COMMERCIAL CLOTHES WASHER MANUFACTURERS

TSL	Net national change in jobs in 2043 (thousands)
1	0.07
2	0.08
3	0.46
4	0.52
5	0.62

4. Impact on Utility or Performance of Equipment

For the reasons stated above in section II.G.1.d, DOE believes that for purposes of 42 U.S.C. 6295(o)(2)(B)(i)(IV), none of the efficiency levels considered in this notice reduces the utility or performance of equipment under consideration in this rulemaking.

5. Impact of Any Lessening of Competition

In weighing the promulgation of any proposed standards, DOE is required to consider any lessening of competition that is likely to result from the adoption of those standards. The determination of the likely competitive impacts stemming from a proposed standard is made by the Attorney General, who transmits this determination, along with an analysis of the nature and extent of the impact, to the Secretary of Energy. (See 42 U.S.C. 6295(o)(2)(B)(i)(VI) and (B)(ii).)

DOE carefully considered the determination received from DOJ in response to the October 2008 NOPR, and accordingly chose efficiency levels for this SNOPR that appear achievable by all CCW manufacturers using existing equipment platforms and technologies. As such, there should be minimal impact on the CCW market and hence its manufacturers. To assist the Attorney General in making a determination for this SNOPR, DOE has provided DOJ with copies of this notice and the TSD for review. DOE will consider DOJ's comments on today's SNOPR in preparing the final rule.

DOE notes that if, based on the public comments received and its further consideration of this issue, it were to establish a single equipment class in setting standards for CCWs, DOE intends to give considerable weight to the potential adverse effects of a single equipment class efficiency standard on competition in the CCW market. That is, DOE does not intend to set a standard that produced significant adverse impacts on competition in this market.

6. Need of the Nation To Conserve Energy

Improving the energy efficiency of CCWs, where economically justified, would likely improve the security of the Nation's energy system by reducing overall demand for energy. Reduced electricity demand may also improve the reliability of the electricity system. As a measure of this reduced demand, DOE expects the energy savings from the adopted standards to eliminate the need for approximately 0.010 gigawatts (GW) of generating capacity by 2043.

Enhanced energy savings from higher standards for CCWs also produces environmental benefits in the form of reduced emissions of air pollutants and greenhouse gases associated with energy production, and with building use of fossil fuels at sites where CCWs are used. Table V.17 provides DOE's estimate of cumulative CO_2, NO_X, and Hg emissions reductions that would result from the TSLs considered in this rulemaking. The expected energy savings from new standards for CCWs may also reduce the cost of maintaining nationwide emissions standards and constraints. In the environmental assessment (chapter 16 of the TSD accompanying this supplemental notice), DOE reports estimated annual changes in CO_2, NO_X, and Hg emissions attributable to each TSL.

TABLE V.17—SUMMARY OF EMISSIONS REDUCTIONS FOR COMMERCIAL CLOTHES WASHERS

[Cumulative for Equipment Sold from 2013 to 2043]

Emissions	TSL				
	1	2	3	4	5
CO_2 *(Mt)*	2.36	2.39	5.07	5.66	6.11
NO_X *(kt)*	1.43	1.45	3.04	3.39	3.66
Hg *(t)*	0–0.01	0–0.01	0–0.03	0–0.03	0–0.03

Mt = million metric tons.
kt = thousand metric tons.
t = metric tons.

As discussed in section III.J of this supplemental notice, DOE does not report SO_2 emissions reductions from power plants because reductions from an energy conservation standard would not affect the overall level of SO_2 emissions in the United States due to the emissions caps for SO_2.

NO_X emissions from 28 eastern States and D.C. are limited under CAIR, Although CAIR has been remanded to EPA by the D.C. Circuit, it will remain in effect until it is replaced by a rule consistent with the Court's December 23, 2008, opinion in *North Carolina v. EPA.* North Carolina v. EPA, 550 F.3d 1176 (D.C. Cir. 2008). Because all States covered by CAIR opted to reduce NO_X emissions through participation in cap and trade programs for electric generating units, emissions from these sources are capped across the CAIR region.

For the 28 eastern States and D.C. where CAIR is in effect, no NO_X emissions reductions will occur due to the permanent cap. Under caps, physical emissions reductions in those States would not result from the energy conservation standards under consideration by DOE, but standards might have produced an environmentally related economic impact in the form of lower prices for emissions allowance credits, if large enough. However, DOE determined that in the present case, such standards would not produce an environmentally related economic impact in the form of lower prices for emissions allowance credits, because the estimated reduction in NO_X emissions or the corresponding allowance credits in States covered by the CAIR cap would be too small to affect allowance prices for NO_X under the CAIR. In contrast, new or amended energy conservation standards would reduce NO_X emissions in those 22 States that are not affected by CAIR. As a result, the NEMS–BT does forecast NO_X emissions reductions from energy sources in those 22 States from the CCW standards considered in today's SNOPR.

In the October 2008 NOPR, however, DOE provided a different estimate of NO_X reductions because DOE assumed that the CAIR rule had been vacated. This is because the CAIR rule was vacated by the D.C. Circuit in its July 11, 2008 decision in *North Carolina* v. *Environmental Protection Agency.* 531 F.3d 896 (D.C. Cir. 2008). As noted above, the D.C. Circuit, in a December 23, 2008, opinion, decided to allow the CAIR rule to remain in effect until it is replaced by a rule consistent with the court's earlier opinion, but this decision came well after the publish date of the October 2008 NOPR..Thus, for the October 2008 NOPR, DOE established a range of NO_X reductions based on low and high emission rates (in kt of NO_X emitted per TWh of electricity generated) derived from the *AEO 2008.* DOE anticipated that, in the absence of the CAIR's trading program, the new or amended conservation standards would reduce NO_X emissions nationwide, not just in 22 States.

As noted in section III.J, DOE was able to estimate the changes in Hg emissions associated with an energy conservation standard as follows. DOE notes that the NEMS–BT model used as an integral part of today's rulemaking does not estimate Hg emissions reductions due to new energy conservation standards, as it assumed that Hg emissions would be subject to EPA's CAMR. 70 FR 28606 (May 18, 2005). CAMR would have permanently capped emissions of mercury for new and existing coal-fired plants in all States by 2010. As with SO_2 and NO_X, DOE assumed that under such a system, energy conservation standards would have resulted in no physical effect on these emissions, but might have resulted in an environmentally related economic benefit in the form of a lower price for emissions allowance credits if those credits were large enough. DOE estimated that the change in the Hg emissions from energy conservation standards would not be large enough to influence allowance prices under CAMR.

On February 8, 2008, the D.C. Circuit issued its decision in *New Jersey* v. *Environmental Protection Agency* to vacate CAMR. 517 F.3d 574 (D.C. Cir. 2008). In light of this development and because the NEMS–BT model could not be used to directly calculate Hg emissions reductions, DOE used the Hg emission rates discussed below to calculate emissions reductions in the October 2008 NOPR. This same methodology is used for today's SNOPR as well due to the continued fluid environment ''* * * with many States planning to enact new laws or make existing laws more stringent.'' EIA *AEO 2009* (March 2009), p. 18. The NEMS–BT has only rough estimates of Hg emissions, and it was felt that the range of emissions used in the NOPR remain appropriate given these circumstances.

Therefore, rather than using the NEMS–BT model, DOE established a range of Hg rates to estimate the Hg emissions that could be reduced through standards. DOE's low estimate assumed that future standards would displace electrical generation only from natural gas-fired power plants, thereby resulting in an effective emission rate of zero. (Under this scenario, coal-fired power plant generation would remain unaffected.) The low-end emission rate is zero because natural gas-fired power plants have virtually zero Hg emissions associated with their operation.

DOE's high estimate, which assumed that standards would displace only coal-fired power plants, was based on a nationwide Hg emission rate from *AEO 2008* for the October 2008 NOPR. (Under this scenario, gas-fired power plant generation would remain unaffected and that no future reductions in the rate of Hg emissions from such sources would occur.) Because power plant emission rates are a function of local regulation, scrubbers, and the Hg content of coal, it is extremely difficult to identify a precise high-end emission rate. Therefore, the most reasonable estimate is based on the assumption that all displaced coal generation would have been emitting at the average emission rate for coal generation as specified by the April update to *AEO 2009.* As noted previously, because virtually all Hg emitted from electricity generation is from coal-fired power plants, DOE based the emission rate on the tons of Hg emitted per TWh of coal-generated electricity. Based on the emission rate for 2006, DOE derived a high-end emission rate of 0.0255 tons per TWh. To estimate the reduction in Hg emissions, DOE multiplied the emission rate by the reduction in coal-generated electricity due to the standards considered in the utility impact analysis. These changes in Hg emissions are extremely small, ranging from 0.03 to 0.27 percent of the national base-case emissions forecast by NEMS–BT, depending on the TSL.

In the October 2008 NOPR, DOE proposed accounting for the monetary value of CO_2 emission reductions associated with standards. DOE proposed to use the range $0 to $20 per ton for reductions in the year 2007 in 2007$. 73 FR 62034, 62110 (Oct. 17, 2008). These estimates were intended to represent the lower and upper bounds of the costs and benefits likely to be experienced in the United States. The lower bound was based on an assumption of no benefit and the upper bound was based on an estimate of the mean value of worldwide impacts due to climate change that was reported by the Intergovernmental Panel on Climate Change (IPCC) in its ''Fourth Assessment Report.''

For today's SNOPR, DOE is relying on a new set of values recently developed by an interagency process that conducted a thorough review of existing estimates of the social cost of carbon (SCC). The SCC is intended to be a monetary measure of the incremental damage resulting from greenhouse gas (GHG) emissions, including, but not limited to, net agricultural productivity loss, human health effects, property damages from sea level rise, and changes in ecosystem services. Any effort to quantify and to monetize the harms associated with climate change will raise serious questions of science, economics, and ethics. But with full regard for the limits of both quantification and monetization, the SCC can be used to provide estimates of the social benefits of reductions in GHG emissions.

For at least three reasons, any single estimate of the SCC will be contestable. First, scientific and economic knowledge about the impacts of climate change continues to grow. With new and better information about relevant questions, including the cost, burdens, and possibility of adaptation, current estimates will inevitably change over time. Second, some of the likely and potential damages from climate change—for example, the value society places on adverse impacts on endangered species—are not included in all of the existing economic analyses. These omissions may mean that the best current estimates are too low. Third, controversial ethical judgments, including those involving the treatment of future generations, play a role in judgments about the SCC (see in particular the discussion of the discount rate, below).

To date, regulations have used a range of values for the SCC. For example, a regulation proposed by the U.S. Department of Transportation (DOT) in 2008 assumed a value of $7 per ton CO_2 (2006$) for 2011 emission reductions (with a range of $0–14 for sensitivity analysis). Regulation finalized by DOE used a range of $0–$20 (2007$). Both of these ranges were designed to reflect the value of damages to the United States resulting from carbon emissions, or the ''domestic'' SCC. In the final Model Year 2011 Corporate Average Fuel Economy rule, DOT used both a domestic SCC value of $2/t CO_2 and a

global SCC value of $33/t CO_2 (with sensitivity analysis at $80/t$CO_2$), increasing at 2.4 percent per year thereafter.

In recent months, a variety of agencies have worked to develop an objective methodology for selecting a range of interim SCC estimates to use in regulatory analyses until improved SCC estimates are developed. The following summary reflects the initial results of these efforts and proposes ranges and values for interim social costs of carbon used in this rule. It should be emphasized that the analysis described below is preliminary. These complex issues are of course undergoing a process of continuing review. Relevant agencies will be evaluating and seeking comment on all of the scientific, economic, and ethical issues before establishing final estimates for use in future rulemakings.

The interim judgments resulting from the recent interagency review process can be summarized as follows: (a) DOE and other Federal agencies should consider the global benefits associated with the reductions of CO_2 emissions resulting from efficiency standards and other similar rulemakings, rather continuing the previous focus on domestic benefits; (b) these global benefits should be based on SCC estimates (in 2007$) of $55, $33, $19, $10, and $5 per ton of CO_2 equivalent emitted (or avoided) in 2007; (c) the SCC value of emissions that occur (or are avoided) in future years should be escalated using an annual growth rate of 3 percent from the current values); and (d) domestic benefits are estimated to be approximately 6 percent of the global values. These interim judgments are based on the following considerations.

1. *Global and domestic estimates of SCC.* Because of the distinctive nature of the climate change problem, estimates of both global and domestic SCC values should be considered, but the global measure should be ''primary.'' This approach represents a departure from past practices, which relied, for the most part, on measures of only domestic impacts. As a matter of law, both global and domestic values are permissible; the relevant statutory provisions are ambiguous and allow the agency to choose either measure. (It is true that Federal statutes are presumed not to have extraterritorial effect, in part to ensure that the laws of the United States respect the interests of foreign sovereigns. But use of a global measure for the SCC does not give extraterritorial effect to Federal law and hence does not intrude on such interests.)

It is true that under OMB guidance, analysis from the domestic perspective is required, while analysis from the international perspective is optional. The domestic decisions of one nation are not typically based on a judgment about the effects of those decisions on other nations. But the climate change problem is highly unusual in the sense that it involves (a) a global public good in which (b) the emissions of one nation may inflict significant damages on other nations and (c) the United States is actively engaged in promoting an international agreement to reduce worldwide emissions.

In these circumstances, the global measure is preferred. Use of a global measure reflects the reality of the problem and is expected to contribute to the continuing efforts of the United States to ensure that emission reductions occur in many nations.

Domestic SCC values are also presented. The development of a domestic SCC is greatly complicated by the relatively few region- or country-specific estimates of the SCC in the literature. One potential estimate comes from the DICE (Dynamic Integrated Climate Economy, William Nordhaus) model. In an unpublished paper, Nordhaus (2007) produced disaggregated SCC estimates using a regional version of the DICE model. He reported a U.S. estimate of $1/t$CO_2$ (2007 value, 2007$), which is roughly 11 percent of the global value.

An alternative source of estimates comes from a recent EPA modeling effort using the FUND (Climate Framework for Uncertainty, Negotiation and Distribution, Center for Integrated Study of the Human Dimensions of Global Change) model. The resulting estimates suggest that the ratio of domestic to global benefits varies with key parameter assumptions. With a 3-percent discount rate, for example, the U.S. benefit is about 6 percent of the global benefit for the ''central'' (mean) FUND results, while, for the corresponding ''high'' estimates associated with a higher climate sensitivity and lower global economic growth, the U.S. benefit is less than 4 percent of the global benefit. With a 2-percent discount rate, the U.S. share is about 2 to 5 percent of the global estimate.

Based on this available evidence, a domestic SCC value equal to 6 percent of the global damages is used in this rulemaking. This figure is in the middle of the range of available estimates from the literature. It is recognized that the 6 percent figure is approximate and highly speculative and alternative approaches will be explored before establishing final values for future rulemakings.

2. *Filtering existing analyses.* There are numerous SCC estimates in the existing literature, and it is legitimate to make use of those estimates to produce a figure for current use. A reasonable starting point is provided by the meta-analysis in Richard Tol, ''The Social Cost of Carbon: Trends, Outliers, and Catastrophes, Economics: The Open-Access, Open-Assessment E-Journal,'' Vol. 2, 2008–25. *http://www.economics-ejournal.org/economics/journalarticles/2008–25* (2008). With that starting point, it is proposed to ''filter'' existing SCC estimates by using those that (1) are derived from peer-reviewed studies; (2) do not weight the monetized damages to one country more than those in other countries; (3) use a ''business as usual'' climate scenario; and (4) are based on the most recent published version of each of the three major integrated assessment models (IAMs): FUND, DICE and PAGE (Policy Analysis of the Greenhouse Effect).

Proposal (1) is based on the view that those studies that have been subject to peer review are more likely to be reliable than those that have not been. Proposal (2) is based on a principle of neutrality and simplicity; it does not treat the citizens of one nation differently on the basis of speculative or controversial considerations. Proposal (3) stems from the judgment that as a general rule, the proper way to assess a policy decision is by comparing the implementation of the policy against a counterfactual state where the policy is not implemented. A departure from this approach would be to consider a more dynamic setting in which other countries might implement policies to reduce GHG emissions at an unknown future date, and the United States could choose to implement such a policy now or in the future.

Proposal (4) is based on three complementary judgments. First, the FUND, PAGE, and DICE models now stand as the most comprehensive and reliable efforts to measure the damages from climate change. Second, the latest versions of the three IAMs are likely to reflect the most recent evidence and learning, and hence they are presumed to be superior to those that preceded them. It is acknowledged that earlier versions may contain information that is missing from the latest versions. Third, any effort to choose among them, or to reject one in favor of the others, would be difficult to defend at this time. In the absence of a clear reason to choose among them, it is reasonable to base the SCC on all of them.

The agency is keenly aware that the current IAMs fail to include all relevant information about the likely impacts

from greenhouse gas emissions. For example, ecosystem impacts, including species loss, do not appear to be included in at least two of the models. Some human health impacts, including increases in food-borne illnesses and in the quantity and toxicity of airborne allergens, also appear to be excluded. In addition, there has been considerable recent discussion of the risk of catastrophe and of how best to account for worst-case scenarios. It is not clear whether the three IAMs take adequate account of these potential effects.

3. *Use a model-weighted average of the estimates at each discount rate.* At this time, there appears to be no scientifically valid reason to prefer any of the three major IAMs (FUND, PAGE, and DICE). Consequently, the estimates are based on an equal weighting of estimates from each of the models. Among estimates that remain after applying the filter, the average of all estimates within a model is derived. The estimated SCC is then calculated as the average of the three model-specific averages. This approach ensures that the interim estimate is not biased towards specific models or more prolific authors.

4. *Apply a 3-percent annual growth rate to the chosen SCC values.* SCC is assumed to increase over time, because future emissions are expected to produce larger incremental damages as physical and economic systems become more stressed as the magnitude of climate change increases. Indeed, an implied growth rate in the SCC is produced by most studies that estimate economic damages caused by increased GHG emissions in future years. But neither the rate itself nor the information necessary to derive its implied value is commonly reported. In light of the limited amount of debate thus far about the appropriate growth rate of the SCC, applying a rate of 3 percent per year seems appropriate at this stage. This value is consistent with the range recommended by IPCC (2007) and close to the latest published estimate (Hope, 2008).

For climate change, one of the most complex issues involves the appropriate discount rate. OMB's current guidance offers a detailed discussion of the relevant issues and calls for discount rates of 3 percent and 7 percent. It also permits a sensitivity analysis with low rates for intergenerational problems. (''If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefits using discount rates of 3 and 7 percent.'') The SCC is being developed within the general context of the current guidance.

The choice of a discount rate, especially over long periods of time, raises highly contested and exceedingly difficult questions of science, economics, philosophy, and law. See, *e.g.,* William Nordhaus, ''The Challenge of Global Warming (2008); Nicholas Stern, The Economics of Climate Change'' (2007); ''Discounting and Intergenerational Equity'' (Paul Portney and John Weyant, eds., 1999). Under imaginable assumptions, decisions based on cost-benefit analysis with high discount rates might harm future generations—at least if investments are not made for the benefit of those generations. (See Robert Lind, ''Analysis for Intergenerational Discounting,'' *id.* at 173, 176–177.) At the same time, use of low discount rates for particular projects might itself harm future generations, by ensuring that resources are not used in a way that would greatly benefit them. In the context of climate change, questions of intergenerational equity are especially important.

Reasonable arguments support the use of a 3-percent discount rate. First, that rate is among the two figures suggested by OMB guidance, and hence it fits with existing National policy. Second, it is standard to base the discount rate on the compensation that people receive for delaying consumption, and the 3-percent rate is close to the risk-free rate of return, proxied by the return on long term inflation-adjusted U.S. Treasury Bonds. (In the context of climate change, it is possible to object to this standard method for deriving the discount rate.) Although these rates are currently closer to 2.5 percent, the use of 3 percent provides an adjustment for the liquidity premium that is reflected in these bonds' returns.

At the same time, other arguments support use of a 5-percent discount rate. First, that rate can also be justified by reference to the level of compensation for delaying consumption, because it fits with market behavior with respect to individuals' willingness to trade off consumption across periods as measured by the estimated post-tax average real returns to private investment (*e.g.,* the S&P 500). In the climate setting, the 5-percent discount rate may be preferable to the riskless rate because it is based on risky investments and the return to projects to mitigate climate change is also risky. In contrast, the 3-percent riskless rate may be a more appropriate discount rate for projects where the return is known with a high degree of confidence (*e.g.,* highway guardrails).

Second, 5 percent, and not 3 percent, is roughly consistent with estimates implied by reasonable inputs to the theoretically derived Ramsey equation, which specifies the optimal time path for consumption. That equation specifies the optimal discount rate as the sum of two components. The first reflects the fact that consumption in the future is likely to be higher than consumption today (even accounting for climate impacts), so diminishing marginal utility implies that the same monetary damage will cause a smaller reduction of utility in the future. Standard estimates of this term from the economics literature are in the range of 3 to 5 percent. The second component reflects the possibility that a lower weight should be placed on utility in the future, to account for social impatience or extinction risk, which is specified by a pure rate of time preference (PRTP). A conventional estimate of the PRTP is 2 percent. (Some observers believe that a principle of intergenerational equity suggests that the PRTP should be close to zero.) It follows that discount rate of 5 percent is within the range of values which are able to be derived from the Ramsey equation, albeit at the low end of the range of estimates usually associated with Ramsey discounting.

It is recognized that the arguments above—for use of market behavior and the Ramsey equation—face objections in the context of climate change, and of course there are alternative approaches. In light of climate change, it is possible that consumption in the future will not be higher than consumption today, and if so, the Ramsey equation will suggest a lower figure. Some people have suggested that a very low discount rate, below 3 percent, is justified in light of the ethical considerations calling for a principle of intergenerational neutrality. See Nicholas Stern, ''The Economics of Climate Change'' (2007); for contrary views, see William Nordhaus, The A Question of Balance (2008); Martin Weitzman, ''*Review* of the *Stern Review* on the Economics of Climate Change.'' *Journal of Economic Literature,* 45(3): 703–724 (2007). Additionally, some analyses attempt to deal with uncertainty with respect to interest rates over time; a possible approach enabling the consideration of such uncertainties is discussed below. Richard Newell and William Pizer, ''Discounting the Distant Future: How Much do Uncertain Rates Increase Valuations?'' J. Environ. Econ. Manage. 46 (*2003*) 52–71.

The application of the methodology outlined above yields estimates of the SCC that are reported in Table V18. These estimates are reported separately

using 3-percent and 5-percent discount rates. The cells are empty in rows 10 and 11 because these studies did not report estimates of the SCC at a 3-percent discount rate. The model-weighted means are reported in the final or summary row; they are $33 per t CO_2 at a 3-percent discount rate and $5 per t CO_2 with a 5-percent discount rate.

TABLE V.18—GLOBAL SOCIAL COST OF CARBON (SCC) ESTIMATES ($/T CO_2 IN 2007 (2006$)), BASED ON 3% AND 5% DISCOUNT RATES*

	Model	Study	Climate scenario	3%	5%
1	FUND	Anthoff et al. 2009	FUND default	6	−1
2	FUND	Anthoff et al. 2009	SRES A1b	1	−1
3	FUND	Anthoff et al. 2009	SRES A2	9	−1
4	FUND	Link and Tol 2004	No THC	12	3
5	FUND	Link and Tol 2004	THC continues	12	2
6	FUND	Guo et al. 2006	Constant PRTP	5	−1
7	FUND	Guo et al. 2006	Gollier discount 1	14	0
8	FUND	Guo et al. 2006	Gollier discount 2	7	−1
			FUND Mean	8.25	0
9	PAGE	Wahba & Hope 2006	A2-scen	57	7
10	PAGE	Hope 2006			7
11	DICE	Nordhaus 2008			8
Summary			Model-weighted Mean	33	5

*The sample includes all peer reviewed, non-equity-weighted estimates included in Tol (2008), Nordhaus (2008), Hope (2008), and Anthoff et al. (2009), that are based on the most recent published version of FUND, PAGE, or DICE and use business-as-usual climate scenarios. All values are based on the best available information from the underlying studies about the base year and year dollars, rather than the Tol (2008) assumption that all estimates included in his review are 1995 values in 1995$. All values were updated to 2007 using a 3-percent annual growth rate in the SCC, and adjusted for inflation using GDP deflator.

DOE has conducted analyses at $33 and $5 per ton as these represent the estimates associated with the 3 percent and 5 percent discount rates, respectively. The 3 percent and 5 percent estimates have independent appeal and at this time a clear preference for one over the other is not warranted. Thus, DOE has also included—and centered its current attention on—the average of the estimates associated with these discount rates, which is $19. (Based on the $19 global value, the domestic value would be $1.14 per ton of CO_2 equivalent.)

It is true that there is uncertainty about interest rates over long time horizons. Recognizing that point, Newell and Pizer have made a careful effort to adjust for that uncertainty. See Newell and Pizer, supra. This is a relatively recent contribution to the literature.

There are several concerns with using this approach in this context. First, it would be a departure from current OMB guidance. Second, an approach that would average what emerges from discount rates of 3 percent and 5 percent reflects uncertainty about the discount rate, but based on a different model of uncertainty. The Newell-Pizer approach models discount rate uncertainty as something that evolves over time; in contrast, one alternative approach would assume that there is a single discount rate with equal probability of 3 percent and 5 percent.

Table V.19 reports on the application of the Newell-Pizer adjustments. The precise numbers depend on the assumptions about the data generating process that governs interest rates. Columns (1a) and (1b) assume that ''random walk'' model best describes the data and uses 3-percent and 5-percent discount rates, respectively. Columns (2a) and (2b) repeat this, except that it assumes a ''mean-reverting'' process. As Newell and Pizer report, there is stronger empirical support for the random walk model.

TABLE V.19—GLOBAL SOCIAL COST OF CARBON ESTIMATES ($/T CO_2 IN 2007 IN 2006$),* USING NEWELL & PIZER ADJUSTMENT FOR FUTURE DISCOUNT RATE UNCERTAINTY**

	Model	Study	Climate scenario	Random-walk model		Mean-reverting model	
				3%	5%	3%	5%
				(1a)	(1b)	(2a)	(2b)
1	FUND	Anthoff et al. 2009	FUND default	10	0	7	−1
2	FUND	Anthoff et al. 2009	SRES A1b	2	0	1	−1
3	FUND	Anthoff et al. 2009	SRES A2	15	0	10	−1
4	FUND	Link and Tol 2004	No THC	20	6	13	4
5	FUND	Link and Tol 2004	THC continues	20	4	13	2
6	FUND	Guo et al. 2006	Constant PRTP	9	0	6	−1
7	FUND	Guo et al. 2006	Gollier discount 1	14	0	14	0
8	FUND	Guo et al. 2006	Gollier discount 2	7	−1	7	−1
			FUND Mean	12	1	9	0
9	PAGE	Wahba & Hope 2006	A2-scen	97	13	63	8
10	PAGE	Hope 2006			13		8
11	DICE	Nordhaus 2008			15		9

TABLE V.19—GLOBAL SOCIAL COST OF CARBON ESTIMATES ($/T CO_2 IN 2007 IN 2006$),* USING NEWELL & PIZER ADJUSTMENT FOR FUTURE DISCOUNT RATE UNCERTAINTY**—Continued

	Model	Study	Climate scenario	Random-walk model		Mean-reverting model	
				3%	5%	3%	5%
Summary			Model-weighted Mean	55	10	36	6

* The sample includes all peer reviewed, non-equity-weighted estimates included in Tol (2008), Nordhaus (2008), Hope (2008), and Anthoff et al. (2009), that are based on the most recent published version of FUND, PAGE, or DICE and use business-as-usual climate scenarios. All values are based on the best available information from the underlying studies about the base year and year dollars, rather than the Tol (2008) assumption that all estimates included in his review are 1995 values in 1995$. All values were updated to 2007 using a 3-percent annual growth rate in the SCC, and adjusted for inflation using GDP deflator.

** Assumes a starting discount rate of 3 percent. Newell and Pizer (2003) based adjustment factors are not applied to estimates from Guo *et al.* (2006) that use a different approach to account for discount rate uncertainty (rows 7–8).

The resulting estimates of the social cost of carbon are necessarily greater. When the adjustments from the random walk model are applied, the estimates of the social cost of carbon are $10 and $55, with the 3 percent and 5 percent discount rates, respectively. The application of the mean-reverting adjustment yields estimates of $6 and $36. Since the random walk model has greater support from the data, DOE also conducted analyses with the value of the SCC set at $10 and $55.

In summary, DOE considered in its decision process for this notice of proposed rulemaking the potential global benefits resulting from reduced CO_2 emissions valued at $5, $10, $19, $30 and $55 per metric ton, and has also presented the domestic benefits derived using a value of $1.14 per metric ton. All of these unit values represent emissions that are valued in 2007$. The final net present values for cumulative emissions reductions are reported in 2008$ so that they can be compared with other rulemaking analyses in the same dollar units.

Table V. and Table V.21 present the resulting estimates of the potential range of NPV benefits associated with reducing CO_2 emissions.

TABLE V.20—ESTIMATES OF VALUE OF CO_2 EMISSIONS REDUCTIONS UNDER COMMERCIAL CLOTHES WASHER TRIAL STANDARD LEVELS AT 7-PERCENT DISCOUNT RATE

TSL	Estimated cumulative CO_2 emission reductions (Mt)	Value of CO_2 emission reductions (million 2008$)					
		Domestic	Global				
		$1.14/ton CO_2	$5/ton CO_2	$10/ton CO_2	$19/ton CO_2	$33/ton CO_2	$55/ton CO_2
1	2.36	1	6	12	22	39	65
2	2.39	1	6	12	23	40	66
3	5.07	3	13	25	48	84	140
4	5.66	3	14	28	54	93	156
5	6.11	3	15	31	58	101	168

TABLE V.21—ESTIMATES OF VALUE OF CO_2 EMISSIONS REDUCTIONS UNDER COMMERCIAL CLOTHES WASHER TRIAL STANDARD LEVELS AT 3-PERCENT DISCOUNT RATE

TSL	Estimated cumulative CO_2 emission reductions (Mt)	Value of CO_2 emission reductions (million 2008$)					
		Domestic	Global				
		$1.14/ton CO_2	$5/ton CO_2	$10/ton CO_2	$19/ton CO_2	$33/ton CO_2	$55/ton CO_2
1	2.36	3	13	26	49	84	141
2	2.39	3	13	26	49	86	143
3	5.07	6	28	55	105	182	303
4	5.66	7	31	61	117	202	337
5	6.11	8	33	66	126	219	364

DOE is well aware that scientific and economic knowledge about the contribution of CO_2 and other GHG emissions to changes in the future global climate and the potential resulting damages to the world economy continues to evolve rapidly. Thus, any value placed in this rulemaking on reducing CO_2 emissions is subject to likely change.

DOE, together with other Federal agencies, is reviewing various methodologies for estimating the monetary value of reductions in CO_2 and other GHG emissions. This review will consider the comments on this subject that are part of the public record for this and other rulemakings, as well as other methodological assumptions and issues, such as whether the appropriate values should represent domestic U.S. benefits, as well as global benefits (and costs). Given the complexity of the many issues involved, this review is ongoing. However, consistent with DOE's legal obligations,

and taking into account the uncertainty involved with this particular issue, DOE has included in today's SNOPR the most recent values and analyses employed in a rulemaking by another Federal agency.

DOE also investigated the potential monetary benefit of reduced NO_X and Hg emissions from the TSLs it considered. As previously stated, DOE's initial analysis assumed the presence of nationwide emission caps on SO_2 and Hg, and caps on NO_X emissions in the 28 States covered by CAIR. In the presence of these caps, DOE concluded that negligible physical reductions in power sector emissions would occur, but that the standards could put downward pressure on the prices of emissions allowances in cap and trade markets. Estimating this effect is very difficult because of factors such as credit banking, which can change the trajectory of prices. DOE has concluded that the effect from energy conservation standards on SO_2 allowance prices is likely to be negligible, based on runs of the NEMS–BT model. See chapter 16 of the SNOPR TSD for further details.

As noted above, standards would not produce an economic impact in the form of lower prices for NO_X emissions allowance credits in the 28 eastern States and D.C. covered by the CAIR cap. However, new or amended energy conservation standards would reduce NO_X emissions in those 22 States that are not affected by CAIR. DOE estimated the monetized value of NO_X emissions reductions resulting from each of the TSLs considered for today's SNOPR based on environmental damage estimates from the literature. Available estimates suggest a very wide range of monetary values for NO_X emissions, ranging from $370 per ton to $3,800 per ton of NO_X from stationary sources, measured in 2001$ (equivalent to a range of $432 per ton to $4,441 per ton in 2007$). Refer to the OMB, Office of Information and Regulatory Affairs, ''2006 Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities,'' Washington, DC, for additional information.

For Hg emissions reductions, DOE estimated the national monetized values resulting from the TSLs considered for today's SNOPR based on environmental damage estimates from the literature. DOE determined that the impact of Hg emissions from power plants on humans is considered highly uncertain. However, DOE identified two estimates of the environmental damage of Hg based on two estimates of the adverse impact of childhood exposure to methyl mercury on IQ for American children, and subsequent loss of lifetime economic productivity resulting from these IQ losses. The high-end estimate is based on an estimate of the current aggregate cost of the loss of IQ in American children that results from exposure to Hg of U.S. power plant origin ($1.3 billion per year in year 2000$), which works out to $32.6 million per ton emitted per year (2007$).[40] The low-end estimate is $0.66 million per ton emitted (in 2004$) or $0.73 million per ton in 2007$. DOE derived this estimate from an evaluation of mercury control that used different methods and assumptions from the first study but was also based on the present value of the lifetime earnings of children exposed.[41]

Table V.22 and Table V.23 present the resulting estimates of the potential range of present value benefits associated with reduced national NO_X and Hg emissions from the TSLs DOE considered. The final net present values for cumulative emissions reductions are reported in 2008$ so that they can be compared with other rulemaking analyses in the same dollar units.

TABLE V.22—ESTIMATES OF VALUE OF REDUCTIONS OF HG AND NO_X UNDER TRIAL STANDARD LEVELS AT A 7-PERCENT DISCOUNT RATE

Commercial clothes washer TSL	Estimated cumulative NO_X emission reductions (kt)	Value of estimated NO_X emission reductions (million 2008$)	Estimated cumulative Hg emission reductions (t)	Value of estimated Hg emission reductions (million 2008$)
1	1.43	0.19 to 1.96	0 to 0.013	0 to 0.12.
2	1.45	0.19 to 1.99	0 to 0.013	0 to 0.12.
3	3.04	0.41 to 4.17	0 to 0.029	0 to 0.27.
4	3.39	0.45 to 4.64	0 to 0.032	0 to 0.30.
5	3.66	0.49 to 5.01	0 to 0.035	0 to 0.33.

TABLE V.23—ESTIMATES OF VALUE OF REDUCTIONS OF HG AND NO_X UNDER TRIAL STANDARD LEVELS AT A 3-PERCENT DISCOUNT RATE

Commercial clothes washer TSL	Estimated cumulative NO_X emission reductions (kt)	Value of estimated NO_X emission reductions (million 2008$)	Estimated cumulative Hg emission reductions (t)	Value of estimated Hg emission reductions (million 2008$)
1	1.43	0.38 to 3.92	0 to 0.013	0 to 0.25.
2	1.45	0.39 to 3.98	0 to 0.013	0 to 0.26.
3	3.04	0.81 to 8.36	0 to 0.029	0 to 0.56.
4	3.39	0.91 to 9.31	0 to 0.032	0 to 0.63.
5	3.66	0.98 to 10.04	0 to 0.035	0 to 0.68.

[40] Trasande, L., *et al.,* ''Applying Cost Analyses to Drive Policy that Protects Children,'' 1076 Ann. N.Y. Acad. Sci. 911 (2006).

[41] Ted Gayer and Robert Hahn, ''Designing Environmental Policy: Lessons from the Regulation of Mercury Emissions,'' Regulatory Analysis 05–01, AEI-Brookings Joint Center for Regulatory Studies, Washington, DC (2004). A version of this paper was published in the *Journal of Regulatory Economics* in 2006. The estimate was derived by back-calculating the annual benefits per ton from the net present value of benefits reported in the study.

TABLE V.24—ESTIMATES OF ADDING NPV OF CUSTOMER SAVINGS TO NPV OF LOW- AND HIGH-END GLOBAL MONETIZED BENEFITS FROM CO_2 NO_X, AND HG EMISSIONS REDUCTIONS FOR ALL TSLS AT 3- AND 7-PERCENT DISCOUNT RATES

TSL	CO_2 value of $5/metric ton CO_2* billion 2008$ and low values for NO_X and Hg**		CO_2 value of $55/metric ton CO_2* billion 2008$ and high values for NO_X and Hg***	
	7-percent discount rate	3-percent discount rate	7-percent discount rate	3-percent discount rate
1	0.03	0.17	0.09	0.30
2	0.05	0.21	0.11	0.34
3	0.73	1.81	0.86	2.09
4	0.83	2.09	0.98	2.41
5	1.04	2.53	1.20	2.87

* These values per ton represent the global negative externalities of CO_2. The unit values are in 2007$ while cumulative NPV is in 2008$.

** Low Value corresponds to a value of $432 per ton of NO_X emissions in 2007$ and no effect on Hg emissions. The unit values are in 2007$ while cumulative NPV is in 2008$.

*** High Value corresponds to a value of $4,441 per ton of NO_X emissions in 2007$ and $32.6 million per ton of Hg emissions in 2007$. The unit values are in 2007$ while cumulative NPV is in 2008$.

TABLE V.25—ESTIMATES OF ADDING NPV OF CUSTOMER SAVINGS TO NPV OF LOW- AND HIGH-END MONETIZED BENEFITS FROM CO_2 EMISSIONS REDUCTIONS FOR ALL TSLS AT 3- AND 7-PERCENT DISCOUNT RATES

TSL	CO_2 value of $5/metric ton CO_2* billion 2008$		CO_2 value of $55/metric ton CO_2* billion 2008$	
	7-percent discount rate	3-percent discount rate	7-percent discount rate	3-percent discount rate
1	0.02	0.09	0.08	0.22
2	0.03	0.11	0.09	0.24
3	0.37	0.92	0.50	1.19
4	0.42	1.06	0.57	1.37
5	0.53	1.28	0.68	1.61

* These values per ton represent the global negative externalities of CO_2. The unit values are in 2007$ while cumulative NPV is in 2008$.

The NPV of the monetized benefits associated with emissions reductions can be viewed as a complement to the NPV of the consumer savings calculated for each TSL considered in this rulemaking. Table V.24 presents the NPV values for CCWs that would result if DOE were to apply the low- and high-end estimates of the potential benefits resulting from reduced CO_2, NO_X and Hg emissions to the NPV of consumer savings calculated for each TSL considered in this rulemaking, at both a 7- and 3-percent discount rate. Table V.24 presents the NPV values for CCWs that would result if DOE were to apply the low- and high-end estimates of the potential global benefits resulting from reduced CO_2 emissions only to the NPV of consumer savings calculated for each TSL considered in this rulemaking, at both a 7- and 3-percent discount rate. For CO_2, only the range of global benefit values are used, $5 and $55 in 2007$, although the actual benefit estimates are provided in 2008$.

Although comparing the value of consumer savings to the values of emission reductions provides a valuable perspective, please note the following: (1) The national consumer savings are domestic U.S. consumer monetary savings found in market transactions while the values of emission reductions are based on ranges of estimates of imputed marginal social costs, which, in the case of CO_2, are meant to reflect global benefits; and (2) the assessments of consumer savings and emission-related benefits are performed with different computer models, leading to different time frames for the analyses. The present value of national consumer savings is measured for the period 2015–2065 (31 years from 2015 to 2045 inclusive, plus the longest lifetime of the equipment shipped in the 31st year). However, the timeframes of the benefits associated with the emission reductions differ. For example, the value of CO_2 emission reductions is meant to reflect the present value of all future climate related impacts, even those beyond 2065.

DOE seeks comment on the above presentation of NPV values and on the consideration of GHG emissions in future energy efficiency standards rulemakings, including alternative methodological approaches to including GHG emissions in its analysis. More specifically, DOE seeks comment on both how it integrates monetized GHG emissions or Social Cost of Carbon values, as well as other monetized benefits or costs, into its analysis and models, and also on suggested alternatives to the current approach.

Table V.26 presents the estimated wastewater discharge reductions due to the TSLs for CCWs. In chapter 16 of the TSD accompanying this notice, DOE reports annual changes in wastewater discharge attributable to each TSL.

TABLE V.26—SUMMARY OF WASTEWATER DISCHARGE REDUCTIONS

[Cumulative Reductions for Equipment Sold from 2013 to 2043]

	TSL				
	1	2	3	4	5
Wastewater Discharge Reduction *(trillion gallons)*	0.00	0.01	0.14	0.16	0.21

C. Proposed Standards

1. Overview

Under 42 U.S.C. 6295(o)(2)(A) and 6316(a), EPCA requires that any new or amended energy conservation standard for any type (or class) of covered product or equipment be designed to achieve the maximum improvement in energy efficiency that the Secretary determines is technologically feasible and economically justified. In determining whether a standard is economically justified, the Secretary must determine whether the benefits of the standard exceed its burdens to the greatest extent practicable, in light of the following seven factors:

(1) The economic impact of the standard on manufacturers and consumers of the products or equipment subject to the standard;

(2) The savings in operating costs throughout the estimated average life of the covered products or equipment in the type (or class) compared to any increase in the price, initial charges, or maintenance expenses for the covered products or equipment that are likely to result from the imposition of the standard;

(3) The total projected amount of energy (or, as applicable, water) savings likely to result directly from the imposition of the standard;

(4) Any lessening of the utility or the performance of the covered products or equipment 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 considers relevant.

(42 U.S.C. 6295(o)(2)(B)(i) and 6316(a))

The new or amended standard also must ''result in significant conservation of energy.''

(42 U.S.C. 6295(o)(3)(B) and 6316(a))

In selecting the proposed energy conservation standards for CCWs for consideration in today's SNOPR, DOE started by examining the maximum technologically feasible levels, and determined whether those levels were economically justified. If DOE determined that the maximum technologically feasible level was not justified, DOE then analyzed the next lower TSL to determine whether that level was economically justified. DOE repeated this procedure until it identified an economically justified TSL.

To aid the reader in understanding the benefits and/or burdens of each TSL, the following tables summarize the quantitative analytical results for each TSL, based on the assumptions and methodology discussed above. These tables present the results—or, in some cases, a range of results—for each TSL. The range of values reported in these tables for industry impacts represents the results for the different markup scenarios that DOE used to estimate manufacturer impacts.

In addition to the quantitative results, DOE also considers other burdens and benefits that affect economic justification.

In sum, today's proposed standard levels for the equipment that is the subject of this rulemaking reflect DOE's careful balancing of the relevant statutory factors under EPCA. After considering public comments on this SNOPR, DOE will publish a final rule that either adopts the proposed TSL, one of the higher or lower TSLs, or some value in between.

2. Conclusion

Table V.27 presents a summary of the quantitative results for each CCW TSL.

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Table V.27 Summary of Results for Commercial Clothes Washers

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5
Primary Energy Saved (quads)	0.04	0.04	0.10	0.11	0.12
7% Discount Rate	0.01	0.01	0.03	0.03	0.03
3% Discount Rate	0.02	0.02	0.06	0.06	0.07
Primary Water Saved (trillion gallons)	0.00	0.01	0.14	0.16	0.21
7% Discount Rate	0.00	0.00	0.04	0.04	0.06
3% Discount Rate	0.00	0.00	0.08	0.09	0.11
Generation Capacity Reduction (gigawatts)**	0.005	0.005	0.010	0.011	0.012
NPV (2008$ billion):					
7% Discount Rate	0.01	0.02	0.36	0.41	0.51
3% Discount Rate	0.08	0.10	0.89	1.03	1.25
Industry Impacts:					
Industry NPV (2008$ million)	4 – 3	1 – 0	(5) – (7)	(8) – (10)	(20) – (23)
Industry NPV (% Change)	6.0 – 4.5	2.2 – 0.8	(7.8) – (11.4)	(12.7) – (16.6)	(33.1) – (37.3)
Cumulative Emissions Impacts†:					
CO_2 (Mt)	2.36	2.39	5.07	5.66	6.11
NO_x (kt)	1.43	1.45	3.04	3.39	3.66
Hg (t)	0 – 0.01	0 – 0.01	0 – 0.03	0 – 0.03	0 – 0.03
Value of Emission Reductions:					
CO_2 (2008$ million)††					
7% Discount Rate	6 – 65	6 – 66	13 – 140	14 – 156	15 – 168
3% Discount Rate	13 – 141	13 – 143	28 – 303	31 – 337	33 – 364
NO_x (2008$ million)					
7% Discount Rate	0.2 – 2.0	0.2 – 2.0	0.4 – 4.2	0.5 – 4.6	0.5 – 5.0
3% Discount Rate	0.4 – 3.9	0.4 – 4.0	0.8 – 8.4	0.9 – 9.3	1.0 – 10.0
Hg (2008$ million)					
7% Discount Rate	0.0 – 0.1	0.0 – 0.1	0.0 – 0.3	0.0 – 0.3	0.0 – 0.3
3% Discount Rate	0.0 – 0.3	0.0 – 0.3	0.0 – 0.6	0.0 – 0.6	0.0 – 0.7
Wastewater Discharge Impacts (trillion gallons)	0.00	0.01	0.14	0.16	0.21
Mean LCC Savings* (2008$):					
Top-Loading, Multi-Family	(8.1)	(8.1)	179	179	179

Top-Loading, Laundromat	(17.7)	(17.7)	190	190	190
Front-Loading, Multi-Family	4.7	19.5	19.5	91	203
Front-Loading, Laundromat	5.2	22.0	22.0	93	216
Median PBP (years):					
Top-Loading, Multi-Family	11.7	11.7	4.6	4.6	4.6
Top-Loading, Laundromat	7.9	7.9	2.8	2.8	2.8
Front-Loading, Multi-Family	0.0	0.4	0.4	3.0	2.9
Front-Loading, Laundromat	0.0	0.2	0.2	1.8	1.6
LCC Results:					
Top-Loading					
Multi-Family					
Net Cost (%)	43.3	43.3	13.8	13.8	13.8
No Impact (%)	35.3	35.3	1.2	1.2	1.2
Net Benefit (%)	21.5	21.5	85.0	85.0	85.0
Laundromat					
Net Cost (%)	51.4	51.4	2.9	2.9	2.9
No Impact (%)	35.3	35.3	1.2	1.2	1.2
Net Benefit (%)	13.3	13.3	95.9	95.9	95.9
Front-Loading					
Multi-Family					
Net Cost (%)	0.0	0.0	0.0	1.4	1.1
No Impact (%)	96.3	96.3	96.3	23.1	0.0
Net Benefit (%)	3.7	3.7	3.7	75.5	98.9
Laundromat					
Net Cost (%)	0.0	0.0	0.0	0.0	0.0
No Impact (%)	96.3	96.3	96.3	23.1	0.0
Net Benefit (%)	3.7	3.7	3.7	76.9	100.0

* Parentheses indicate negative (-) values. For LCCs, a negative value means an increase in LCC by the amount indicated.

** Changes in installed generation capacity by 2043 based on AEO 2009 April Release Reference Case.

† CO_2 emissions impacts include physical reductions at power plants and at buildings where the appliance is being used. NO_x emissions impacts include physical reductions at power plants and at buildings where the appliance is being used.

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

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First, DOE considered TSL 5, the max-tech level. TSL 5 would likely save 0.12 quads of energy and 0.21 trillion gallons of water through 2043, an amount DOE

considers significant. For the Nation as a whole, DOE projects that TSL 5 would result in a net increase of $0.51 billion in NPV, using a discount rate of 7 percent. The emissions reductions at TSL 5 are 6.11 Mt of CO_2, 3.66 kt of NO_X, and 0 t to 0.03 t of Hg. At TSL 5, the estimated benefit of reducing CO_2 emissions based on global estimates of the value of CO_2 ranges from $15 million to $168 million at a 7-percent discount rate and $33 million to $364 million at a 3-percent discount rate. Total generating capacity in 2043 is estimated to decrease compared to the reference case by 0.012 GW under TSL 5.

At TSL 5, DOE projects that the average top-loading CCW consumer would experience a decrease in LCC of $179 in multi-family applications and $190 in laundromats. DOE also estimates an LCC decrease for an overwhelming majority of consumers in the Nation that purchase top-loading CCWs—85 percent of consumers in multi-family applications and 96 percent of consumers in laundromats. The median payback period of the average consumer at TSL 5 in multi-family applications and in laundromats is projected to be 4.6 years and 2.8 years, respectively.

At TSL 5, DOE projects that the average front-loading CCW consumer would experience a decrease in LCC of $203 in multi-family applications and $216 in laundromats. DOE also estimates an LCC decrease for an overwhelming majority of consumers that purchase front-loading CCWs—99 percent of consumers in multi-family applications and 100 percent of consumers in laundromats. The median payback period of the average consumer at TSL 5 in multi-family applications and in laundromats is projected to be 2.9 years and 1.6 years, respectively.

At TSL 5, DOE estimated the projected change in INPV ranges from a total decrease of $20.4 million for both equipment classes to a total decrease of $23.0 million. At TSL 5, DOE recognizes the risk of very large negative impacts if manufacturers' expectations about reduced shipments are realized. TSL 5 could result in a net loss as high as 37.3 percent in INPV to CCW manufacturers. Also, DOE is especially sensitive to the potentially severe impacts to the LVM of CCWs. Because the LVM's clothes washer revenue is so dependent on CCW sales, DOE is concerned that TSL 5 will cause material harm to the LVM.

Although DOE recognizes the increased economic benefits that could result from TSL 5, DOE has tentatively concluded that the benefits of a Federal standard at TSL 5 would be outweighed by the potential for disincentivizing consumers from purchasing more efficient front-loading CCWs. At TSL 5, front-loading CCWs are highly efficient but have a purchase price estimated to be $497 more expensive than top-loading CCWs. With such a large price differential between the two types of CCWs, and with less than 2 percent of the front-loading market at TSL 5, DOE is concerned that significant numbers of potential consumers of front-loading CCWs would choose to purchase a less efficient top-loading unit.

As described in section III.E.2.c, DOE did analyze the impacts of increased purchase prices for each equipment class but independently of the other. Because the price impacts for more efficient top-loaders are higher than those for more efficient front-loaders, DOE estimated that top-loading CCW sales would decrease slightly more rapidly than for front-loaders. But DOE was not able to estimate the cross price elasticity of demand between the two equipment classes to determine whether consumers of front-loading CCWs would switch to less expensive top-loaders.

If potential front-loading CCW consumers did decide to switch to less expensive top-loading washers, the NES and NPV realized from TSL 5 would be diminished. DOE notes that in developing the energy savings and water savings estimates for TSL 5, the agency effectively held constant the ratio of front-loading to top-loading CCW shipments across the various TSLs. Particularly at TSL 3 to TSL 5, the differences in these estimates are small, especially at a 7-percent discount rate. DOE requests comment as to whether it should account for the cross price elasticity of demand between the two equipment classes when calculating the anticipated energy and water savings at the different TSLs. DOE also seeks relevant data or other information on this topic. DOE believes that the values currently in Table V.27 represent the high end of the potential energy and water savings for these TSLs. Taking into account price elasticity of demand could affect the anticipated energy and water savings of the various TSLs, and it could potentially result in a change in the TSL with the highest projected energy/water savings level.

In addition, TSL 5 would adversely impact manufacturers' INPV to a significant extent. Not only does the industry face a potential, significant loss in industry INPV, but manufacturers would also need to make significant capital investments for both types of CCWs in order to produce both top-loading and front-loading washers at the maximum technologically feasible levels. After carefully considering the analysis and weighing the benefits and burdens of TSL 5, the Secretary has reached the following initial conclusion: At TSL 5, the benefits of energy savings, economic benefit, and emissions reductions would be outweighed by the potential for giving consumers less incentive to purchase high efficiency front-loading CCWs and the large capital conversion costs that could result in a substantial reduction in INPV for manufacturers.

Next, DOE considered TSL 4. TSL 4 would likely save 0.11 quads of energy and 0.16 trillion gallons of water through 2043, an amount DOE considers significant. For the Nation as a whole, DOE projects that TSL 4 would result in a net increase of $0.41 billion in NPV, using a discount rate of 7 percent. The emissions reductions at TSL 4 are 5.66 Mt of CO_2, 3.39 kt of NO_X, and 0 t to 0.03 t of Hg. At TSL 4, the estimated benefits of reducing CO_2 emissions based on global estimates of the value of CO_2 ranges from $14 million to $156 million at a 7-percent discount rate and $31 million to $337 million at a 3-percent discount rate. Total generating capacity in 2043 is estimated to decrease compared to the reference case by 0.011 GW under TSL 4.

At TSL 4, top-loading CCWs have the same efficiency as at TSL 5. Therefore, top-loading CCW consumers will experience the same LCC impacts and payback periods as TSL 5. At TSL 4 for front-loading CCWs, DOE projects that the average front-loading CCW consumer would experience a decrease in LCC of $91 in multi-family applications and $93 in laundromats. DOE also estimates an LCC decrease for an overwhelming majority of consumers that purchase front-loading CCWs—76 percent of consumers in multi-family applications and 77 percent of consumers in laundromats. The median payback period of the average consumer at TSL 4 in multi-family applications and in laundromats is projected to be 3.0 years and 1.8 years, respectively.

DOE estimated the projected change in INPV ranges from a decrease of $7.8 million to a decrease of $10.2 million. At TSL 4, DOE recognizes the risk of very large negative impacts if manufacturers' expectations about reduced shipments are realized. TSL 4 could result in a net loss as high as 16.6 percent in INPV to CCW manufacturers. Also, DOE is especially sensitive to the potentially severe impacts to the LVM. Since the LVM's clothes washer revenue is so dependent on CCW sales, DOE is concerned that TSL 4 will materially harm the LVM.

Although DOE recognizes the increased economic benefits that could result from TSL 4, DOE has the same concerns regarding TSL 4 as for TSL 5. Namely, DOE has concerns as to the potential of TSL 4 to give consumers less incentive to purchase more efficient front-loading washers. At TSL 4, front-loading CCWs are highly efficient but have a purchase price estimated to be $454 more expensive than top-loading washers. With such a price differential between the two types of CCWs, and with less than 4 percent of the front-loading market currently meeting TSL 4, DOE is concerned that a significant number of potential consumers of front-loading CCWs would be more likely choose to purchase a top-loading CCW, which is less efficient. If potential front-loading CCW consumers did decide to switch to top-loading models, the NES and NPV realized from TSL 4 would be diminished. In addition, TSL 4 would adversely impact manufacturers' INPV to a significant extent. Not only does the industry face a potential loss in industry INPV, but manufacturers would also need to make significant capital investments for both types of CCWs in order to produce both top-loading washers at the maximum technologically feasible level and front-loading washers at a level which only 3 percent of the market currently meets. After carefully considering the analysis and weighing the benefits and burdens of TSL 4, the Secretary has reached the following initial conclusion: At TSL 4, the benefits of energy savings, economic benefit, and emissions reductions would be outweighed by the potential for giving consumers less incentive to purchase high efficiency front-loading CCWs and the large capital conversion costs that could result in a substantial reduction in INPV for manufacturers.

Next, DOE considered TSL 3. TSL 3 would likely save 0.10 quads of energy and 0.14 trillion gallons of water through 2043, an amount DOE considers significant. For the Nation as a whole, DOE projects that TSL 3 would result in a net increase of $0.36 billion in NPV, using a discount rate of 7 percent. The emissions reductions at TSL 3 are 5.07 Mt of CO_2, 3.04 kt of NO_X, and 0 t to 0.03 t of Hg. The estimated benefits of reducing CO_2 emissions based on global estimates of the value of CO_2 ranges from $13 million to $140 million at a 7-percent discount rate and $28 million to $303 million at a 3-percent discount rate. Total generating capacity in 2043 is estimated to decrease compared to the reference case by 0.010 GW under TSL 3.

At TSL 3, top-loading CCWs have the same efficiency as at TSL 5. Therefore, top-loading CCW consumers would experience the same LCC impacts and payback periods as TSL 5. At TSL 3 for front-loading CCWs, DOE projects that the average front-loading CCW consumer would experience a decrease in LCC of $19 in multi-family applications and $22 in laundromats. DOE also estimates an LCC decrease for all consumers that do not already purchase front-loading CCWs with an efficiency meeting TSL 3. The median payback period of the average consumer at TSL 3 in multi-family applications and in laundromats is projected to be 0.4 years and 0.2 years, respectively.

DOE estimated the projected change in INPV ranges from a decrease of $4.8 million to a decrease of $7.0 million. At TSL 3, DOE recognizes the risk of very large negative impacts if manufacturers' expectations about reduced shipments are realized. In TSL 3 could result in a net loss as high as 11.4 percent in INPV to CCW manufacturers. Also, DOE is especially sensitive to the potential adverse impacts to the LVM. Since the LVM's clothes washer revenue is so dependent on CCW sales, DOE is concerned that TSL 3 could disproportionately impact the LVM.

DOE recognizes the increased economic benefits that could result from TSL 3. DOE still has concerns of the potential for giving consumers less incentive to purchase more efficient front-loading washers, but at TSL 3, the price difference between front-loading and top-loading CCWs drops to $414. However, given that DOE projects that the average front-loading CCW consumer would experience an LCC savings at TSL 3, DOE believes that most front-loading CCW consumers not already purchasing washers at TSL 3 would likely continue to purchase a front-loading unit if standards are set at TSL 3. DOE notes that TSL 3 adversely impacts manufacturers' INPV, but because such a large percent of the front-loading market is at TSL 3, manufacturers would likely not need to make significant capital investments for front-loading CCWs. Product development and conversion expenses and capital investments would only be required in order to produce higher efficiency top-loading washers at TSL 3.

After considering the analysis and weighing the benefits and the burdens, DOE has tentatively concluded that the benefits of a TSL 3 standard outweigh the burdens. In particular, the Secretary has tentatively concluded that TSL 3 saves a significant amount of energy and is technologically feasible and economically justified. Therefore, DOE today proposes to adopt the energy conservation standards for CCWs at TSL 3. Table V.28 lists today's proposed energy conservation standards for CCWs. DOE's proposal to amend energy conservation standards for CCWs at TSL 3 reflects its tentative conclusion that this standard level would minimize the potential adverse impacts on the LVM and, therefore, would also minimize the adverse impacts on CCW market competition. However, DOE will carefully consider DOJ's review of today's proposed standards for CCWs and any public comment received on these impacts before issuing its final rule for this equipment. It is DOE's intent to set a standard that will not produce significant adverse impacts on competition in this market. In proposing the standards in today's notice, DOE has also taken into consideration DOJ's determination on the standards proposed in the October 2008 NOPR.

TABLE V.28—PROPOSED ENERGY CONSERVATION STANDARDS FOR COMMERCIAL CLOTHES WASHERS

Equipment class	Proposed energy conservation standards
Top-loading	1.60 Modified Energy Factor/ 8.5 Water Factor.
Front-loading ..	2.00 Modified Energy Factor/ 5.5 Water Factor.

DOE seeks comment on the proposed standards. This is identified as Issue 7 in section VII.E of today's supplemental notice (Issues on Which DOE Seeks Comment.)

DOE also calculated the annualized values for certain benefits and costs at the various TSLs. Table V.29 shows the annualized values. DOE used a two-step calculation process to convert the time-series of costs and benefits into annualized values. First, DOE calculated a present value for the time-series of costs and benefits using a discount rate of either three or seven percent. From the present value, DOE then calculated the fixed annual payment over the analysis time period (2013 to 2043) that yielded the same present value. The fixed annual payment is the annualized value. Although DOE calculated annualized values, this does not imply that the time-series of cost and benefits from which the annualized values were determined are a steady stream of payments.

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Table V.29 Annualized Benefits and Costs for Commercial Clothes Washers

TSL	Category	Unit	Primary Estimate		Low Estimate		High Estimate	
			7%	3%	7%	3%	7%	3%
1	**Benefits**							
	Annualized Monetized ($millions/year)	2008$	12.75	15.32	11.25	13.46	14.63	17.70
	Annualized Quantified	CO_2 (Mt)	0.07	0.07	0.07	0.07	0.07	0.07
		NO_x (kT)	0.041	0.044	0.041	0.044	0.041	0.044
		Hg (T)	0.000	0.000	0.000	0.000	0.000	0.000
	Costs							
	Annualized Monetized ($millions/year)	2008$	11.44	11.06	10.67	10.19	12.01	11.65
	Net Benefits/Costs							
	Annualized Monetized ($millions/year)	2008$	3.66	6.99	2.93	6.01	4.97	8.79
2	**Benefits**							
	Annualized Monetized ($millions/year)	2008$	13.98	16.79	12.43	14.86	15.90	19.23
	Annualized Quantified	CO_2 (Mt)	0.07	0.07	0.07	0.07	0.07	0.07
		NO_x (kT)	0.042	0.045	0.042	0.045	0.042	0.045
		Hg (T)	0.000	0.000	0.000	0.000	0.000	0.000
	Costs							
	Annualized Monetized ($millions/year)	2008$	11.49	11.11	10.72	10.23	12.06	11.70
	Net Benefits/Costs							
	Annualized Monetized ($millions/year)	2008$	4.87	8.45	4.09	7.40	6.22	10.30
3	**Benefits**							
	Annualized Monetized ($millions/year)	2008$	60.62	72.82	54.87	65.33	66.59	80.43
	Annualized Quantified	CO_2 (Mt)	0.14	0.16	0.14	0.16	0.14	0.16
		NO_x (kT)	0.087	0.094	0.087	0.094	0.087	0.094
		Hg (T)	0.001	0.001	0.001	0.001	0.001	0.001
	Costs							
	Annualized Monetized ($millions/year)	2008$	23.44	22.67	21.85	20.87	24.61	23.87
	Net Benefits/Costs							
	Annualized	2008$	42.23	56.04	38.07	50.34	47.04	62.44

	Monetized ($millions/year)							
4	**Benefits**							
	Annualized Monetized ($millions/year)	2008$	68.83	82.66	62.65	74.62	75.33	90.94
	Annualized Quantified	CO_2 (Mt)	0.16	0.17	0.16	0.17	0.16	0.17
		NO_x (kT)	0.097	0.105	0.097	0.105	0.097	0.105
		Hg (T)	0.001	0.001	0.001	0.001	0.001	0.001
	Costs							
	Annualized Monetized ($millions/year)	2008$	25.45	24.62	23.81	22.75	26.67	25.87
	Net Benefits/Costs							
	Annualized Monetized ($millions/year)	2008$	49.01	64.60	44.47	58.43	54.29	71.63
5	**Benefits**							
	Annualized Monetized ($millions/year)	2008$	81.19	97.52	74.46	88.77	88.24	106.51
	Annualized Quantified	CO_2 (Mt)	0.17	0.19	0.17	0.19	0.17	0.19
		NO_x (kT)	0.105	0.113	0.105	0.113	0.105	0.113
		Hg (T)	0.001	0.001	0.001	0.001	0.001	0.001
	Costs							
	Annualized Monetized ($millions/year)	2008$	28.19	27.26	26.47	25.30	29.47	28.57
	Net Benefits/Costs							
	Annualized Monetized ($millions/year)	2008$	59.08	77.34	54.08	70.55	64.86	85.02

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VI. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

Today's regulatory action has been determined to be a ''significant regulatory action'' under section 3(f)(1) of Executive Order 12866, ''Regulatory Planning and Review.'' 58 FR 51735 (Oct. 4, 1993). Accordingly, this action was subject to review under the Executive Order by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget.

The Executive Order requires each agency to identify the problem the agency intends to address that warrants new agency action (including, where applicable, the failures of private markets or public institutions), as well as to assess the significance of that problem in evaluating whether any new regulation is warranted. E.O. 12866, section 1(b)(1).

The October 2008 NOPR evaluated the market failure that the proposed rule would address. 73 FR 62034, 62122–23 (Oct. 17, 2008). DOE's analysis for CCWs explicitly quantifies and accounts for the percentage of consumers that already purchase more efficient equipment and takes these consumers into account when determining the national energy savings associated with various TSLs. The analysis suggests that accounting for the market value of energy savings alone (*i.e.,* excluding any possible additional ''externality'' benefits such as those noted below) would produce enough benefits to yield net benefits across a wide array of equipment and circumstances. In the October 2008 NOPR, DOE requested additional data (including the percentage of consumers purchasing more efficient CCWs and the extent to which consumers will continue to purchase more efficient equipment), in order to test the existence and extent of these consumer actions. 73 FR 62034, 62123 (Oct. 17, 2008). DOE received no such data from interested parties in response to the October 2008 NOPR.

DOE believes that there is a lack of consumer information and/or information processing capability about energy efficiency opportunities in the home appliance market. If this is the case, DOE would expect the energy efficiency for CCWs to be randomly distributed across key variables such as

energy prices and usage levels. DOE has estimated the percentage of consumers that already purchase more efficient CCWs. However, DOE does not correlate the consumer's usage pattern and energy price with the efficiency of the purchased equipment. In the October 2008 NOPR, DOE sought data on the efficiency levels of existing CCWs by how often they are used (*e.g.,* how many times or hours the equipment is used) and their associated energy prices (and/or geographic regions of the country). *Id.* DOE received no such data from interested parties in response to the October 2008 NOPR. Therefore, DOE was unable to test for today's supplemental rule the extent to which purchasers of CCWs behave as if they are unaware of the costs associated with their energy consumption.

A related issue is asymmetric information (one party to a transaction has more and better information than the other) and/or high transactions costs (costs of gathering information and effecting exchanges of goods and services). In many instances, the party responsible for an appliance purchase may not be the one who pays the cost to operate it. For example, home builders in large-scale developments often make decisions about appliances without input from home buyers and do not offer options to upgrade those appliances. Also, apartment owners normally make decisions about appliances, but renters often pay the utility bills. If there were no transactions costs, it would be in the home builders' and apartment owners' interest to install appliances that buyers and renters would choose. For example, one would expect that a renter who knowingly faces higher utility bills from low efficiency appliances would be willing to pay less in rent, and the apartment owner would indirectly bear the higher utility cost. However, this information is not readily available, and it may not be in the renter's interest to take the time to develop it, or, in the case of the landlord who installs a high efficiency appliance, to convey that information to the renter.

To the extent that asymmetric information and/or high transactions costs are problems, one would expect to find certain outcomes for appliance energy efficiency. For example, all things being equal, one would not expect to see higher rents for apartments with high efficiency appliances. Conversely, if there were symmetric information, one would expect appliances with higher energy efficiency in rental units where the rent includes utilities compared to those where the renter pays the utility bills separately. Similarly, for single-family homes, one would expect higher energy efficiency levels for replacement units than for appliances installed in new construction. Within the new construction market, one would expect to see appliances with higher energy efficiency levels in custom-built homes (where the buyer has more say in appliance choices) than in comparable homes built in large-scale developments.

The above issues pertaining to asymmetric information and/or high transaction costs seem to be less relevant to the CCW market. For example, as discussed in section III.D.10, DOE concluded that a split incentive is unlikely between route operators and multi-family property owners. Because split incentives are likely not applicable to the CCW market, the probability that asymmetric information exists where one party (*e.g.,* a route operator) has more and better information than the other (*e.g.,* a multi-family property owner) is low. Further, because DOE received no data from interested parties in response to the October 2008 NOPR on the issue of asymmetric information and/or high transactions costs, DOE was unable to conclusively determine for today's supplemental notice the extent to which asymmetric information and/or high transaction costs are a market failure in the CCW market.

In addition, this rulemaking is likely to yield certain external benefits resulting from improved energy efficiency of CCWs that are not captured by the users of such equipment. These benefits include externalities related to environmental protection and energy security that are not reflected in energy prices, such as reduced emissions of greenhouse gases. The TSLs which DOE evaluated resulted in CO_2, NO_X, and Hg emissions reductions. DOE also determined a range of possible monetary benefits associated with the emissions reductions. DOE considered both the emissions reductions and their possible monetary benefit in determining the economic feasibility of the TSLs.

DOE conducted a regulatory impact analysis (RIA) for review by the Office of Information and Regulatory Affairs (OIRA) at OMB. DOE presented to OIRA the draft supplemental notice and other documents prepared for this rulemaking, including the RIA, and has included these documents in the rulemaking record. They are available for public review in the Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC 20024, (202) 586–9127, between 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays.

The RIA is contained as chapter 17 in the TSD prepared for the rulemaking. The RIA consists of (1) a statement of the problem addressed by this regulation, and the mandate for government action; (2) a description and analysis of the feasible policy alternatives to this regulation; (3) a quantitative comparison of the impacts of the alternatives; and (4) the national economic impacts of today's proposed standards. DOE performed an RIA solely for CCWs for today's supplemental notice.

The RIA calculates the effects of feasible policy alternatives to energy conservation standards for CCWs and provides a quantitative comparison of the impacts of the alternatives. DOE evaluated each alternative in terms of its ability to achieve significant energy savings at reasonable costs, and compared it to the effectiveness of today's proposed standards. DOE analyzed these alternatives using a series of regulatory scenarios as input to the NIA spreadsheets for the two equipment classes, which it modified to allow inputs for voluntary measures. For more details on how DOE modified the NIA spreadsheets to determine the impacts due to the various non-regulatory alternatives to standards, refer to chapter 17 of the TSD accompanying this notice.

As shown in Table VI.1 below, DOE identified the following major policy alternatives for achieving increased energy efficiency in conventional CCWs:

(1) No new regulatory action;

(2) Financial incentives;

(3) Consumer rebates;

(4) Consumer tax credits;

(5) Manufacturer tax credits;

(6) Voluntary energy efficiency targets;

(7) Bulk government purchases;

(8) Early replacement; and

(9) Today's proposed approach (national performance and prescriptive standards).

TABLE VI.1—NON-REGULATORY ALTERNATIVES TO COMMERCIAL CLOTHES WASHER STANDARDS

Policy alternatives	Energy savings* (quads)	Water savings (trillion gallons)	Net present value** (billion 2008$)	
			7% Discount rate	3% Discount rate
No new regulatory action	0	0	0	0
Consumer rebates	0.06	0.07	0.18	0.47
Consumer tax credits	0.01	0.01	0.03	0.08
Manufacturer tax credits	0.00	0.01	0.02	0.06
Voluntary energy efficiency targets***	0.02	0.02	0.06	0.15
Early replacement	0.01	0.01	0.11	0.17
Bulk government purchases***	0.00	0.01	0.02	0.04
Today's standards at TSL 3	0.10	0.14	0.36	0.89

* Energy savings are in source quads.
** Net present value is the value in the present of a time series of costs and savings. DOE determined the net present value from 2013 to 2043 in billions of 2008 dollars.
*** Voluntary energy efficiency target and bulk government purchase alternatives are not considered for front-loading washers because the percentage of the market at TSL 3 (today's proposed standard) is well over the market adoption target level that each alternative strives to attain.

The net present value amounts shown in Table VI.1 refer to the NPV for consumers. The costs to the government of each policy (such as rebates or tax credits) are not included in the costs for the NPV since, on balance, consumers would be both paying for (through taxes) and receiving the benefits of the payments. The following paragraphs discuss each of the policy alternatives listed in Table VI.1. (See the chapter 17 of the SNOPR TSD.)

No New Regulatory Action. The case in which no regulatory action is taken with regard to CCWs constitutes the ''base case'' (or ''No Action'') scenario. In this case, between 2013 and 2043, CCWs are expected to use 0.97 quads of primary energy along with 2.2 trillion gallons of water. Since this is the base case, energy savings and NPV are zero by definition.

Consumer Rebates. Consumer rebates cover a portion of the incremental installed cost difference between equipment meeting baseline efficiency levels and those meeting higher efficiency levels, which generally result in a higher percentage of consumers purchasing more efficient models. DOE utilized market penetration curves from a study that analyzed the potential of energy efficiency in California.[42] The penetration curves are a function of benefit-cost ratio (*i.e.,* lifetime operating costs savings divided by increased total installed costs) to estimate the increased market share of more efficient equipment given incentives by a rebate program. Using specific rebate amounts, DOE calculated, for the considered equipment, the benefit-cost ratio of the more efficient appliance with and without the rebate to project the increased market penetration of the equipment due to a rebate program.

For CCWs meeting TSL 3, DOE estimated that the percentage of consumers purchasing the more efficient equipment due to consumer rebates would increase annually by 49.0 percent for top-loading washers and 4.0 percent for front-loading washers. DOE selected the rebate amount using data from rebate programs for CCWs conducted by 24 gas, electric, and water utilities and other agencies. DOE estimated that the impact of this policy would be to permanently transform the market so that the increased market share seen in the first year of the program would be maintained throughout the forecast period. At the estimated participation rates, consumer rebates would be expected to provide 0.06 quads of national energy savings, 74 billion gallons of national water savings, and an NPV of $0.18 billion (at a 7-percent discount rate).

Although DOE estimated that consumer rebates would provide national benefits for CCW consumers, these benefits would be smaller than the benefits resulting from national performance standards at today's proposed levels. Thus, DOE rejected consumer rebates as a policy alternative to national performance standards.

Consumer Tax Credits. Consumer tax credits cover a percentage of the incremental installed cost difference between equipment meeting baseline efficiency levels and those with higher efficiencies. Consumer tax credits are considered a viable non-regulatory market transformation program as evidenced by the inclusion of Federal consumer tax credits in EPACT 2005 for various residential appliances. (Section 1333 of EPACT 2005; codified at 26 U.S.C. 25C) DOE reviewed the market impact of tax credits offered by the Oregon Department of Energy (ODOE) (ODOE, No. 35 at p. 1) and Montana Department of Revenue (MDR) (MDR, No. 36 at p. 1) to estimate the effect of a national tax credit program. To help estimate the impacts from such a program, DOE also reviewed analyses prepared for the California Public Utilities Commission,[43] the Northwest Energy Efficiency Alliance,[44] and the Energy Foundation/Hewlett Foundation.[45] For each the equipment considered for this rulemaking, DOE estimated that the market effect of a tax credit program would gradually increase over a time period until it reached its maximum impact. Once the tax credit program attained its maximum effect, DOE assumed the impact of the policy would be to permanently transform the market at this level.

For CCWs, DOE estimated that consumer tax credits would induce an increase of 1.3 percent in 2013 in the purchase of equipment meeting TSL 3 and eventually increase to a maximum of 5.8 percent in 2020 for both top-loading and front-loading washers.[46] At the estimated participation rates, consumer tax credits would be expected to provide 0.01 quads of national energy

[42] Rufo, M. and F. Coito, *California's Secret Energy Surplus: The Potential for Energy Efficiency* (prepared for The Energy Foundation and The Hewlett Foundation by Xenergy, Inc.) (2002).

[43] Itron and KEMA, *2004/2005 Statewide Residential Retrofit Single-Family Energy Efficiency Rebate Evaluation* (prepared for the California Public Utilities Commission, Pacific Gas And Electric Company, San Diego Gas and Electric Company, Southern California Edison, Southern California Gas Company, CPUC–ID# 1115–04) (2007).

[44] KEMA, *Consumer Product Market Progress Evaluation Report 3* (prepared for Northwest Energy Efficiency Alliance, Report #07–174) (2007).

[45] Rufo, M., and F. Coito, *op. cit.*

[46] Because DOE was not able to identify consumer tax credit programs specific to CCWs, increased market penetrations for residential clothes washers were used to estimate the impact from a tax credit program providing incentives for more efficient CCWs.

savings, 13 billion gallons of national water savings, and an NPV of $0.03 billion (at a 7-percent discount rate).

DOE estimated that while consumer tax credits would yield national benefits for CCW consumers, these benefits would be much smaller than the benefits from today's proposed national performance standards. Thus, DOE rejected consumer tax credits as a policy alternative to national performance standards.

Manufacturer Tax Credits. Manufacturer tax credits are considered a viable non-regulatory market transformation program as evidenced by the inclusion of Federal tax credits in EPACT 2005 for manufacturers of residential appliances. (Section 1334 of EPACT 2005; codified at 26 U.S.C. 45M) Similar to consumer tax credits, manufacturer tax credits would effectively result in lower equipment prices to consumers by an amount that covered part of the incremental price difference between equipment meeting baseline efficiency levels and those meeting higher efficiency levels. Because these tax credits go to manufacturers instead of consumers, research indicates that fewer consumers would be affected by a manufacturer tax credit program than by consumer tax credits.[47] [48] Although consumers would benefit from price reductions passed through to them by the manufacturers, research demonstrates that approximately half the consumers who would benefit from a consumer tax credit program would be aware of the economic benefits of more efficient technologies included in an appliance manufacturer tax credit program. In other words, research estimates that half of the effect from a consumer tax credit program is due to publicly available information or promotions announcing the benefits of the program. This effect, referred to as the ''announcement effect,'' is not part of a manufacturer tax credit program. Therefore, DOE estimated that the effect of a manufacturer tax credit program would be only half of the maximum impact of a consumer tax credit program.

As described earlier in section III.E.2 on the NIA, DOE analyzed the impact of recent Federal manufacturer tax credits on increased sales of high efficiency CCWs. DOE determined that the tax credits have increased the market share of front-loading washers from approximately 20 percent in the year 2005 to its current market share of 30 percent. For purposes of conducting the NIA, DOE estimated that the tax credits would permanently transform the market so that front-loading washers would continue to comprise 30 percent of the market over the entire forecast period, even though the tax credits are set to expire after 2010. For purposes of analyzing the impact of manufacturer tax credits for the RIA, DOE estimated the percentage of consumers purchasing equipment at TSL 3 would be expected to increase by 2.9 percent for both top-loading and front-loading washers. This additional increase of 2.9 percent is relative to the base case (*i.e.,* the case without new efficiency standards) which is comprised of a 30 percent market share of front-loading washers and a 70 percent market share of top-loading washers. DOE assumed that the impact of the manufacturer tax credit policy would be to permanently transform the market so that the increased market share seen in the first year of the program would be maintained throughout the forecast period.

At the above estimated participation rates, manufacturer tax credits would provide 0.005 quads of national energy savings, 9 billion gallons of national water savings, and an NPV of $0.02 billion (at a 7-percent discount rate) for CCWs.

DOE estimated that while manufacturer tax credits would yield national benefits for CCW consumers, these benefits would be much smaller than the benefits from national performance standards. Thus, DOE rejected manufacturer tax credits as a policy alternative to today's proposed national performance standards.

Voluntary Energy Efficiency Targets. DOE estimated the impact of voluntary energy efficiency targets by reviewing the historical and projected market transformation performance of past and current ENERGY STAR programs.

To estimate the impacts from a voluntary energy efficiency program targeting the adoption of top-loading CCWs meeting TSL 3, DOE evaluated the potential impacts of expanding the Federal government's existing ENERGY STAR program for CCWs. DOE modeled the voluntary efficiency program based on the ENERGY STAR program's experience with RCWs.[49] [50] Over the period spanning 2007–2025, ENERGY STAR projected that the market share of RCWs meeting target efficiency levels due to ENERGY STAR will increase to a maximum of 28 percent. DOE estimated that an expanded voluntary program would increase their market share by half of these projected annual amounts for the existing ENERGY STAR program, reaching a maximum of 14 percent increased market share. For CCWs, DOE assumed that the impacts of the existing ENERGY STAR program were already incorporated in the base case, and applied the same pattern of market share increase from an expanded voluntary program to CCWs beginning in 2013. After attaining its maximum market share of 14 percent in the year 2030, DOE's analysis maintained that market share throughout the remainder of the forecast period. DOE estimated that an expanded program of voluntary energy efficiency targets would be expected to provide 0.02 quads of national energy savings, 24 billion gallons of national water savings, and an NPV of $0.06 billion (at a 7-percent discount rate). Although this program would provide national benefits, they were estimated to be smaller than the benefits resulting from today's proposed national performance standards. Thus, DOE rejected the use of voluntary energy efficiency targets as a policy alternative to national performance standards.

DOE did not analyze the potential impacts of voluntary energy efficiency targets for front-loading CCWs because a vast majority of equipment already meets today's proposed standards. In the case of front-loading CCWs, over 96 percent of the market meets TSL 3. The ENERGY STAR program typically targets equipment where a maximum of approximately 25 percent of the existing market meets the target efficiency level.[51] Since the market for front-loading CCWs is well above the 25 percent threshold, DOE did not consider this approach for this equipment class.

Early Replacement. The early replacement policy alternative envisions a program to replace old, inefficient units with models meeting efficiency levels higher than baseline equipment. Under an early replacement program, State governments or electric and gas utilities would provide financial incentives to consumers to retire the appliance early in order to hasten the adoption of more efficient equipment. For all of the considered equipment,

[47] K. Train, *Customer Decision Study: Analysis of Residential Customer Equipment Purchase Decisions* (prepared for Southern California Edison by Cambridge Systematics, Pacific Consulting Services, The Technology Applications Group, and California Survey Research Services) (1994).

[48] Lawrence Berkeley National Laboratory, End-Use Forecasting Group. *Analysis of Tax Credits for Efficient Equipment (1997).* Available at *http://enduse.lbl.gov/Projects/TaxCredits.html.* (Last accessed April 24, 2008.)

[49] Data were not available on the market impacts of the CCW program.

[50] Sanchez *et al., op. cit.*

[51] Sanchez, M. and A. Fanara, ''New Product Development: The Pipeline for Future ENERGY STAR Growth,'' *Proceedings of the 2000 ACEEE Summer Study on Energy Efficiency in Buildings* (2000) Vol 6, pp 343–354.

DOE modeled this policy by applying a 4-percent increase in the replacement rate above the natural rate of replacement for failed equipment. DOE based this percentage increase on program experience with the early replacement of appliances in the State of Connecticut.[52] DOE assumed the program would continue for as long as it would take to ensure that the eligible existing stock in the year that the program began (2013) was completely replaced.

For CCWs, this policy alternative would replace old, inefficient top-loading and front-loading units with models meeting the efficiency levels in TSL 3. DOE estimated that such an early replacement program would be expected to provide 0.01 quads of national energy savings, 9 billion gallons of national water savings, and an NPV of $0.11 billion (at a 7-percent discount rate).

Although DOE estimated that the above early replacement programs for CCWs would provide national benefits, they would be much smaller than the benefits resulting from national performance standards. Thus, DOE rejected early replacement incentives as a policy alternative to national performance standards.

Bulk Government Purchases. Under this policy alternative, the government sector would be encouraged to shift their purchases to equipment that meets the target efficiency levels above baseline levels. Aggregating public sector demand could provide a market signal to manufacturers and vendors that some of their largest customers sought suppliers with equipment that met an efficiency target at favorable prices. This program also could induce ''market pull'' impacts through manufacturers and vendors achieving economies of scale for high-efficiency equipment. Under such a program, DOE would assume that Federal, State, and local government agencies would administer it. At the Federal level, such a program would add more efficient equipment for which the Federal Energy Management Program (FEMP) has energy efficient procurement specifications.

For CCWs, this program would encourage the government sector to shift its purchases to top-loading units that meet the efficiency levels in TSL 3. DOE estimated that this policy would apply to multi-family buildings that are government-owned. Based on a technology review prepared for FEMP by Pacific Northwest National Laboratory (PNNL), approximately 7000 CCWs (representing a 3.2 percent market share) were purchased in the year 2000 for Federal buildings.[53] Based on research of the effectiveness of bulk government purchasing programs, DOE estimated that the market share of more efficient CCWs in Federally owned multi-family buildings would increase at a rate of 8 percent per year over a 10-year period (2013–2022) and remain at the 2022 level for the remainder of the forecast period. DOE estimated that bulk government purchases would be expected to provide 0.003 quads of national energy savings, 7 billion gallons of national water savings, and an NPV of $0.02 billion (at a 7-percent discount rate), benefits which would be much smaller than those estimated for today's proposed national performance standards. Thus, DOE rejected bulk government purchases as a policy alternative to national performance standards.

DOE did not analyze the potential impacts of bulk government purchases for front-loading CCWs because the vast majority of equipment already meets today's proposed standards. In the case of front-loading CCWs, over 96 percent of the market meets TSL 3. FEMP procurement specifications typically promote equipment in the top 25 percent of the existing equipment offerings in terms of efficiency. Since most of the front-loading CCWs sold in the base case already comply with such specifications, DOE was not able to consider this program as a source of data for top-loading CCWs.

National Performance Standards (TSL 3). As indicated in the paragraphs above, none of the alternatives DOE examined would save as much energy as today's proposed energy conservation standards. Therefore, DOE will adopt the efficiency levels listed in section V.C.

B. Review Under the Regulatory Flexibility Act

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

DOE reviewed today's supplemental notice under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. 68 FR 7990. A regulatory flexibility analysis examines the impact of the rule on small entities and considers alternative ways of reducing negative impacts. DOE identified producers of all equipment covered by this rulemaking that have manufacturing facilities located within the United States. DOE then looked at publicly available data and contacted manufacturers, where needed, to determine if they meet the SBA's definition of a small manufacturing facility.

For the manufacturers of equipment covered by this rulemaking, the SBA has set two size thresholds that define which entities are ''small businesses'' for the purposes of the statute. See *http://www.sba.gov/idc/groups/public/documents/sba_homepage/serv_sstd_tablepdf.* Because all CCW manufacturers also produce RCWs, limits for both categories are presented in Table VI.2. DOE used these small business definitions to determine whether any small entities would be required to comply with the rule. (65 FR 30836, 30848 (May 15, 2000), as amended at 65 FR 53533, 53544 (September 5, 2000) and codified at 13 CFR part 121.) The size standards are listed by NAICS code and industry description.

[52] Nexus.and RLW Analytics, *Impact, Process, and Market Study of the Connecticut Appliance Retirement Program: Overall Report, Final.* (Submitted to Northeast Utilities—Connecticut Light and Power and the United Illuminating Company by Nexus Market Research, Inc. and RLW Analytics, Inc.) (2005).

[53] Pacific Northwest National Laboratory, *Assessment of High-Performance, Family-Sized Commercial Clothes Washers* (DOE/EE–0218)(2000).

TABLE VI.2—SBA AND NAICS CLASSIFICATION OF SMALL BUSINESSES POTENTIALLY AFFECTED BY THIS RULE

Industry description	Revenue limit	Employee limit	NAICS
Residential Laundry Equipment Manufacturing	N/A	1,000	335224
Commercial Laundry Equipment Manufacturing	N/A	500	333312

The CCW industry consists of three principal competitors that make up almost 100 percent of the market share. Two of them are high-volume, diversified appliance manufacturers, while the third is a focused laundry equipment manufacturer. Before issuing this SNOPR, DOE interviewed all major CCW manufacturers. Because all CCW manufacturers also make RCWs, DOE also considered whether a CCW manufacturer could be considered a small business entity in that industry. None of the CCW manufacturers fall into any small business category. As a result, DOE certifies that today's SNOPR would not have a significant impact on a substantial number of small entities and that a regulatory flexibility analysis is not required.

C. Review Under the Paperwork Reduction Act

DOE stated in the October 2008 NOPR that this rulemaking would impose no new information and recordkeeping requirements, and that OMB clearance is not required under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). 73 FR 62034, 62130 (Oct. 17, 2008). DOE received no comments on this in response to the October 2008 NOPR. Therefore, for today's supplemental notice DOE has concluded that Office of Management and Budget clearance is not required under the PRA.

D. Review Under the National Environmental Policy Act

DOE has prepared a draft environmental assessment (EA) of the impacts of the supplemental notice pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), the regulations of the Council on Environmental Quality (40 CFR Parts 1500–1508), and DOE's regulations for compliance with the National Environmental Policy Act (10 CFR part 1021). This assessment includes an examination of the potential effects of emission reductions likely to result from the rule in the context of global climate change, as well as other types of environmental impacts. The draft EA has been incorporated into the TSD; the environmental impact analyses are contained primarily in chapter 16 of that document. Before issuing a final rule for CCWs, DOE will consider public comments and, as appropriate, determine whether to issue a finding of no significant impact as part of a final EA or to prepare an environmental impact statement (EIS) for this rulemaking.

E. Review Under Executive Order 13132

Executive Order 13132, ''Federalism,'' 64 FR 43255 (Aug. 4, 1999) imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE has examined today's supplemental notice and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the equipment that is the subject of today's supplemental notice. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d) and 6316(b)(2)(D)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, ''Civil Justice Reform'' (61 FR 4729 (Feb. 7, 1996)) imposes on Federal agencies the general duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; and (3) provide a clear legal standard for affected conduct rather than a general standard and promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, today's supplemental notice meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

DOE reviewed this regulatory action under title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) (UMRA), which requires each Federal agency to assess the effects of Federal regulatory actions on State, local and Tribal governments and the private sector. For a proposed regulatory action likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year (adjusted for inflation), section 202 of UMRA requires an agency to publish a written statement assessing the costs, benefits, and other effects of the rule on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed ''significant intergovernmental mandate,'' and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small

governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA (62 FR 12820) (also available at *http://www.gc.doe.gov*). Although today's supplemental notice does not contain a Federal intergovernmental mandate, it may impose expenditures of $100 million or more on the private sector, although DOE believes such expenditures are likely to be less than $50 million.

Section 202 of UMRA authorizes an agency to respond to the content requirements of UMRA in any other statement or analysis that accompanies the supplemental notice. 2 U.S.C. 1532(c). The content requirements of section 202(b) of UMRA relevant to a private sector mandate substantially overlap the economic analysis requirements that apply under section 325(o) of EPCA and Executive Order 12866. The Supplementary Information section of this supplemental notice and the ''Regulatory Impact Analysis'' section of the SNOPR TSD respond to those requirements.

Under section 205 of UMRA, DOE is obligated to identify and consider a reasonable number of regulatory alternatives before promulgating a rule for which a written statement under section 202 is required. DOE is required to select from those alternatives the most cost-effective and least burdensome alternative that achieves the objectives of the rule unless DOE publishes an explanation for doing otherwise or the selection of such an alternative is inconsistent with law. As required by 42 U.S.C. 6295(h) and (o), 6313(e), and 6316(a), today's supplemental notice would establish energy conservation standards for CCWs that are designed to achieve the maximum improvement in energy efficiency that DOE has determined to be both technologically feasible and economically justified. A full discussion of the alternatives considered by DOE is presented in the ''Regulatory Impact Analysis'' section of the TSD for today's supplemental notice.

H. Review Under the Treasury and General Government Appropriations Act, 1999

DOE determined that, for this rulemaking, it need not prepare a Family Policymaking Assessment under section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105–277). *Id.* DOE received no comments concerning section 654 in response to the October 2008 NOPR, and, therefore, takes no further action in today's supplemental notice with respect to this provision.

I. Review Under Executive Order 12630

DOE determined, under Executive Order 12630, ''Governmental Actions and Interference with Constitutionally Protected Property Rights,'' 53 FR 8859 (March 18, 1988), that the October 2008 NOPR would not result in any takings which might require compensation under the Fifth Amendment to the U.S. Constitution. 73 FR 62034, 62131 (Oct. 17, 2008). DOE received no comments concerning Executive Order 12630 in response to the October 2008 NOPR, and, today's supplemental notice, which adopts no new requirements, also would not result in any takings which might require compensation under the Fifth Amendment. Therefore, DOE takes no further action in today's supplemental notice with respect to this Executive Order.

J. Review Under the Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. The OMB guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed this notice under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,'' 66 FR 28355 (May 22, 2001) requires Federal agencies to prepare and submit to the OIRA a Statement of Energy Effects for any significant energy action. For the October 2008 NOPR, DOE determined that the proposed rule, which set energy conservation standards for commercial clothes washers, was not a ''significant energy action'' within the meaning of Executive Order 13211. 73 FR 62034, 62132 (Oct. 17, 2008). The rule was also not designated as such by OIRA. Accordingly, it did not prepare a Statement of Energy Effects on that proposed rule. DOE received no comments on this issue in response to the October 2008 NOPR. As with the October 2008 NOPR, DOE has concluded that today's supplemental notice is not a significant energy action within the meaning of Executive Order 13211, and OIRA has not designated the rule as such. As a result, DOE has not prepared a Statement of Energy Effects on the rule.

L. Review Under the Information Quality Bulletin for Peer Review

On December 16, 2004, the OMB, in consultation with the Office of Science and Technology, issued its Final Information Quality Bulletin for Peer Review (the Bulletin). 70 FR 2664 (Jan. 14, 2005). The purpose of the Bulletin is to enhance the quality and credibility of the Government's scientific information. The Bulletin establishes that certain scientific information shall be peer reviewed by qualified specialists before it is disseminated by the Federal Government. As indicated in the October 2008 NOPR, this includes influential scientific information related to agency regulatory actions, such as the analyses in this rulemaking. 73 FR 62034, 62132 (Oct. 17, 2008).

As more fully set forth in the October 2008 NOPR, DOE held formal in-progress peer reviews of the types of analyses and processes that DOE has used to develop the energy conservation standards in today's supplemental notice, and issued a report on these peer reviews. *Id.*

VII. Public Participation

A. Attendance at Public Meeting

DOE will hold a public meeting on November 16, 2009 from 9 a.m. until 5 p.m., in Washington, DC. The public meeting will be held at Room 1E–245. To attend the public meeting, please notify Ms. Brenda Edwards at (202) 586–2945 or *Brenda.Edwards@ee.doe.gov.* As explained in the **ADDRESSES** section, foreign nationals visiting DOE Headquarters are subject to advance security screening procedures. Any foreign national wishing to participate in the meeting should advise DOE of this fact as soon as possible by contacting Ms. Brenda Edwards to initiate the necessary procedures.

B. Procedure for Submitting Requests To Speak

Any person who has an interest in this notice, or who is a representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation. Such persons may hand-deliver requests to speak, along with a compact disc (CD) in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format to the address shown in the

ADDRESSES section at the beginning of this SNOPR between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Requests may also be sent by mail or e-mail to: *Brenda.Edwards@ee.doe.gov.*

Persons requesting to speak should briefly describe the nature of their interest in this rulemaking and provide a telephone number for contact. DOE requests persons scheduled to be heard to submit an advance copy of their statements at least two weeks before the public meeting. At its discretion, DOE may permit any person who cannot supply an advance copy of their statement to participate, if that person has made advance alternative arrangements with the Building Technologies Program. The request to give an oral presentation should ask for such alternative arrangements.

C. Conduct of Public Meeting

DOE will designate a DOE official to preside at the public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA, 42 U.S.C. 6306. A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the public meeting. After the public meeting, interested parties may submit further comments on the proceedings as well as on any aspect of the rulemaking until the end of the comment period.

The public meeting will be conducted in an informal, conference style. DOE will present summaries of comments received before the public meeting, allow time for presentations by participants, and encourage all interested parties to share their views on issues affecting this rulemaking. Each participant will be allowed to make a prepared general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will permit other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly and comment on statements made by others. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask questions of participants concerning other matters relevant to this rulemaking. The official conducting the public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the public meeting.

DOE will make the entire record of this proposed rulemaking, including the transcript from the public meeting, available for inspection at the U.S. Department of Energy, Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC, 20024, (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding the proposed rule before or after the public meeting, but no later than the date provided at the beginning of this SNOPR. Information submitted should be identified by docket number EE–2006–STD–0127 and/or RIN 1904–AB93. Comments, data, and information submitted to DOE's e-mail address for this rulemaking should be provided in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format. Interested parties should avoid the use of special characters or any form of encryption and, wherever possible, comments should carry the electronic signature of the author. Comments, data, and information submitted to DOE via mail or hand delivery/courier should include one signed original paper copy. No telefacsimiles (faxes) will be accepted.

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit two copies: One copy of the document including all the information believed to be confidential, and one copy of the document with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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

E. Issues on Which DOE Seeks Comment

DOE is particularly interested in receiving comments and views of interested parties concerning:

(1) Whether the method of ''loading'' clothes washers, or any other characteristic commonly associated with traditional ''top-loading'' or ''front-loading'' clothes washers, are ''features'' within the meaning of 42 U.S.C. 6295(o)(4) in EPCA and whether the availability of such feature(s) would likely be affected by eliminating the separate classes for these equipment types previously established by DOE;

(2) The revised efficiency levels, including the revised max-tech level for top-loading CCWs;

(3) Technological feasibility of the proposed max-tech CCW, including washing and rinsing performance measures for CCWs and population data for water heating CCWs;

(4) The determination of short- and long-run price elasticities of demand and cross price elasticities for top-loading vs. front-loading CCWs and used vs. front-loading CCWs;

(5) The determination of manufacturer impacts, including the effects of manufacturer tax credits and competitive concerns;

(6) The determination of environmental impacts; and

(7) The newly proposed energy conservation standards.

VIII. Approval of the Office of the Secretary

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

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Energy conservation, Household appliances.

Issued in Washington, DC, on October 27, 2009.

Cathy Zoi,

Assistant Secretary, Energy Efficiency and Renewable Energy.

For the reasons stated in the preamble, chapter II, subchapter D, of title 10 of the Code of Federal Regulations, part 431 is proposed to be amended to read as set forth below:

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

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

Authority: 42 U.S.C. 6291–6317.

2. Section 431.156 of subpart I is revised to read as follows:

§ 431.156 Energy and water conservation standards and effective dates.

Each CCW manufactured on or after [INSERT DATE 3 YEARS AFTER FINAL RULE **FEDERAL REGISTER** PUBLICATION], shall have a modified energy factor no less than and a water factor no greater than:

Equipment class	Modified energy factor (cu. ft./kWh/cycle)	Water factor (gal./cu. ft./cycle)
Top-Loading	1.60	8.5
Front-Loading ...	2.00	5.5

[The following letter from the Department of Justice will not appear in the Code of Federal Regulations.]

BILLING CODE 6450–01–P

DEPARTMENT OF JUSTICE
Antitrust Division

DEBORAH A. GARZA
Acting Assistant Attorney General

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December 16, 2008

Warren Belmar, Esq.
Deputy General Counsel for Energy Policy
Department of Energy
Washington, DC 20585

Dear Deputy General Counsel Belmar:

I am responding to your October 1, 2008, letter seeking the views of the Attorney General about the potential impact on competition of proposed amended energy conservation standards for residential kitchen ranges and ovens, microwave ovens, and commercial clothes washers (CCWs). Your request was submitted under Section 325(o)(2)(B)(i)(V) of the Energy Policy and Conservation Act, as amended, ("ECPA"), 42 U.S.C. § 6295(o)(B)(i)(V), which requires the Attorney General to make a determination of the impact of any lessening of competition that is likely to result from the imposition of proposed energy conservation standards. The Attorney General's responsibility for responding to requests from other departments about the effect of a program on competition has been delegated to the Assistant Attorney General for the Antitrust Division in 28 CFR § 0.40(g).

In conducting its analysis the Antitrust Division examines whether a proposed standard may lessen competition, for example, by substantially limiting consumer choice, leaving consumers with fewer competitive alternatives, placing certain manufacturers of a product at an unjustified competitive disadvantage compared to other manufacturers, or by inducing avoidable inefficiencies in production or distribution of particular products.

We have reviewed the proposed standards contained in the Notice of Proposed Rulemaking (73 Fed. Reg. 62034, October 17, 2008) and supplementary information submitted to the Attorney General. We also attended the November 13 public meeting on the proposed standards and conducted interviews with industry members. Based on this review, we have determined that legitimate issues arise as to whether the proposed standards adversely effect competition and consumer choice with respect to (1) gas cooking products with standing pilot lights and (2) top loading CCWs.

The proposed standards would extend the ban on constant burning pilot lights, currently applicable to cooking appliances equipped with electrical supply cords, to appliances that are not

Warren Belmar, Esq.
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equipped with electrical supply cords. As the notice regarding the proposed standards recognizes, certain consumers, including those with religious and cultural practices that prohibit the use of line electricity, those without access to line electricity, and those whose kitchens do not have appropriate electrical outlets, rely on gas cooking appliances with standing pilots in lieu of electrical ignition devices. For these consumers, gas cooking appliances with electronic ignition are not a reasonable substitute. The notice states that gas cooking appliances may become available with technological options such as battery-powered ignition to replace a standing pilot light. However, it is unclear whether such battery-powered devices have been tested for indoor use and whether they are in compliance with safety standards for such use. If these options prove not to be feasible, then the proposed standard could substantially limit consumer choice by eliminating the cooking appliance that most closely meets these consumers' needs.

As to top loading CCWs, it appears that meeting the proposed standards may require substantial investment in the development of new technology that some suppliers of top loading CCWs may not find it economical to make. CCWs are used primarily in multi-housing laundries, with top loading machines accounting for approximately 80 percent of machines in these locations. The remaining 20 percent are front loading machines, which are more energy efficient but significantly more expensive than top loading models. There are only three manufacturers of top loading CCWs selling in the United States. It appears that there is a real risk that one or more of these manufacturers cannot meet the proposed standard. In such a case, CCW purchasers would have fewer competitive alternatives for top loading machines, potentially resulting in purchasers facing higher prices from the remaining top loading manufacturer or manufacturers.

Although the Department of Justice is not in a position to judge whether manufacturers will be able to meet the proposed standards, we urge the Department of Energy to take into account these possible impacts on competition and the availability of options to consumers in determining its final energy efficiency standard for CCWs and residential gas cooking appliances with constant burning pilots. To maintain competition, the Department of Energy should consider keeping the existing standard in place for top loading CCWs. The Department of Energy may wish to consider setting a "no standard" standard for residential gas cooking products with constant burning pilots to address the potential for certain customers to be stranded without an economical product alternative.

The Department of Justice does not believe that the proposed standards for other products listed in the NOPR would likely lead to an adverse effect on competition.

Sincerely,

Deborah Garza

Deborah A. Garza

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