DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket Number EERE–2011–BT–STD–0011]

RIN 1904–AC06

Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps

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

ACTION: Notice of proposed rulemaking.

SUMMARY: The Energy Policy and Conservation Act of 1975 (EPCA), as amended, prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including residential furnaces and residential central air conditioners and heat pumps. EPCA also requires the U.S. Department of Energy (DOE) to determine whether more-stringent, amended standards for these products would be technologically feasible and economically justified, and would save a significant amount of energy. In this notice, DOE proposes energy conservation standards for residential furnaces and for residential central air conditioners and heat pumps identical to those set forth in a direct final rule published elsewhere in today's **Federal Register**. If DOE receives adverse comment and determines that such comment may provide a reasonable basis for withdrawing the direct final rule, DOE will publish a notice withdrawing the direct final rule and will proceed with this proposed rule.

DATES: DOE will accept comments, data, and information regarding the proposed standards no later than October 17, 2011.

ADDRESSES: See section III, ''Public Participation,'' for details. If DOE withdraws the direct final rule published elsewhere in today's **Federal Register**, DOE will hold a public meeting to allow for additional comment on this proposed rule. DOE will publish notice of any public meeting in the **Federal Register**.

Any comments submitted must identify the proposed rule for Energy Conservation Standards for Residential Furnaces, Central Air Conditioners, and Heat Pumps, and provide the docket number EERE–2011–BT–STD–0011 and/or regulatory information number (RIN) 1904–AC06. 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: ResFurnaceAC-2011-Std-0011@ee.doe.gov.* Include Docket Numbers EERE–2008–BT–STD–0006 and EE–2009–BT–STD–0022 and/or RIN number 1904–AC06 in the subject line of the message.

3. *Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

4. *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20024. Telephone: (202) 586–2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

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

Docket: The docket is available for review at *http://www.regulations.gov,* including **Federal Register** notices, framework documents, public meeting attendee lists and transcripts, comments, and other supporting documents/materials. All documents in the docket are listed in the *http://www.regulations.gov* index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

A link to the docket Web page can be found at: *http://www.regulations.gov/#!docketDetail;dct=FR+PR+N+O+SR+PS;rpp=50;so=DESC;sb=postedDate;po=0;D=EERE-2011-BT-STD-0011.* The *http://www.regulations.gov* Web page contains simple instructions on how to access all documents, including public comments, in the docket. See section III for further information on how to submit comments through *http://www.regulations.gov.*

For further information on how to submit or review public comments, or view hard copies of the docket in the Resource Room, contact Ms. Brenda Edwards at (202) 586–2945 or by e-mail: *Brenda.Edwards@ee.doe.gov.*

FOR FURTHER INFORMATION CONTACT: Mr. Mohammed Khan (furnaces) or Mr. Wesley Anderson (central air conditioners and heat pumps), U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Telephone: (202) 586–7892 or (202) 586–7335. E-mail: *Mohammed.Khan@ee.doe.gov* or *Wes.Anderson@ee.doe.gov.*

Mr. Eric Stas or Ms. Jennifer Tiedeman, U.S. Department of Energy, Office of the General Counsel, GC–71, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Telephone: (202) 586–9507 or (202) 287–6111. E-mail: *Eric.Stas@hq.doe.gov* or *Jennifer.Tiedeman@hq.doe.gov.*

SUPPLEMENTARY INFORMATION:

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I. Introduction and Authority

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA or the Act), Public Law 94–163 (42 U.S.C. 6291–6309, as codified) established the Energy Conservation Program for Consumer Products Other Than Automobiles,[1] a program covering most major household appliances (collectively referred to as ''covered products''), which includes the types of residential central air conditioners and heat pumps and furnaces that are the subject of this rulemaking. (42 U.S.C. 6292(a)(3) and (5)) EPCA prescribed energy conservation standards for central air conditioners and heat pumps and directed DOE to conduct two cycles of rulemakings to determine whether to amend these standards. (42 U.S.C. 6295(d)(1)–(3)) The statute also prescribed standards for furnaces,

[1] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated Part A.

except for ''small'' furnaces (*i.e.,* those units with an input capacity less than 45,000 British thermal units per hour (Btu/h)), for which EPCA directed DOE to prescribe standards. (42 U.S.C. 6295(f)(1)–(2)) Finally, EPCA directed DOE to conduct rulemakings to determine whether to amend the standards for furnaces. (42 U.S.C. 6295(f)(4)(A)–(C)) This rulemaking represents the second round of amendments to both the central air conditioner/heat pump and the furnaces standards, under the authority of 42 U.S.C. 6295(d)(3)(B) and (f)(4)(C), respectively.

DOE notes that this rulemaking is one of the required agency actions in two court orders. First, pursuant to the consolidated Consent Decree in *State of New York, et al.* v. *Bodman et al.,* 05 Civ. 7807 (LAP), and *Natural Resources Defense Council, et al.* v. *Bodman, et al.,* 05 Civ. 7808 (LAP), DOE is required to complete a final rule for amended energy conservation standards for residential central air conditioners and heat pumps that must be sent to the **Federal Register** by June 30, 2011. Second, pursuant to the Voluntary Remand in *State of New York, et al.* v. *Department of Energy, et al.,* 08–0311–ag(L); 08–0312–ag(con), DOE agreed to complete a final rule to consider amendments to the energy conservation standards for residential furnaces which it anticipated would be sent to the **Federal Register** by May 1, 2011.

DOE further notes that under 42 U.S.C. 6295(m), the agency must periodically review its already established energy conservation standards for a covered product. Under this requirement, the next review that DOE would need to conduct must occur no later than six years from the issuance of a final rule establishing or amending a standard for a covered product.

The Energy Independence and Security Act of 2007 (EISA 2007; Pub. L. 110–140) amended EPCA, in relevant part, to grant DOE authority to issue a final rule (hereinafter referred to as a ''direct final rule'') establishing an energy conservation standard on receipt of a statement submitted jointly by interested persons that are fairly representative of relevant points of view (including representatives of manufacturers of covered products, States, and efficiency advocates), as determined by the Secretary, that contains recommendations with respect to an energy or water conservation standard that are in accordance with the provisions of 42 U.S.C. 6295(o). A notice of proposed rulemaking (NOPR) that proposes an identical energy efficiency standard must be published simultaneously with the final rule, and DOE must provide a public comment period of at least 110 days on this proposal. 42 U.S.C. 6295(p)(4). Not later than 120 days after issuance of the direct final rule, if one or more adverse comments or an alternative joint recommendation are received relating to the direct final rule, the Secretary must determine whether the comments or alternative recommendation may provide a reasonable basis for withdrawal under 42 U.S.C. 6295(o) or other applicable law. If the Secretary makes such a determination, DOE must withdraw the direct final rule and proceed with the simultaneously-published NOPR. DOE must publish in the **Federal Register** the reason why the direct final rule was withdrawn. *Id.*

On January 15, 2010, Air-Conditioning, Heating, and Refrigeration Institute (AHRI), American Council for an Energy-Efficient Economy (ACEEE), Alliance to Save Energy (ASE), Appliance Standards Awareness Project (ASAP), National Resources Defense Council (NRDC), and Northeast Energy Efficiency Partnership (NEEP) submitted a joint comment [2] to DOE's residential furnaces and central air conditioners/heat pumps rulemakings recommending adoption of a package of minimum energy conservation standards for residential central air conditioners, heat pumps, and furnaces, as well as associated compliance dates for such standards, which represents a negotiated agreement among a variety of interested stakeholders including manufacturers and environmental and efficiency advocates. More specifically, the original agreement was completed on October 13, 2009, and had 15 signatories, including AHRI, ACEEE, ASE, NRDC, ASAP, NEEP, Northwest Power and Conservation Council (NPCC), California Energy Commission (CEC), Bard Manufacturing Company Inc., Carrier Residential and Light Commercial Systems, Goodman Global Inc., Lennox Residential, Mitsubishi Electric & Electronics USA, National Comfort Products, and Trane Residential. The consensus agreement signatories recommended specific energy conservation standards for residential furnaces and central air conditioners and heat pumps that they believed would satisfy the EPCA requirements in 42 U.S.C. 6295(o).

DOE has considered the recommended energy conservation standards and believes that they meet the EPCA requirements for issuance of a direct final rule. As a result, DOE published a direct final rule establishing energy conservation standards for residential furnaces, central air conditioners, and heat pumps elsewhere in today's **Federal Register**. If DOE receives adverse comments that may provide a reasonable basis for withdrawal and withdraws the direct final rule, DOE will consider those comments and any other comments received in determining how to proceed with today's proposed rule.

For further background information on these proposed standards and the supporting analyses, please see the direct final rule published elsewhere in today's **Federal Register**. That document includes additional discussion of the EPCA requirements for promulgation of energy conservation standards; the current standards for residential furnaces, central air conditioners, and heat pumps; the history of the standards rulemakings establishing such standards; and information on the test procedures used to measure the energy efficiency of residential furnaces, central air conditioners, and heat pumps. The document also contains an in-depth discussion of the analyses conducted in support of this rulemaking, the methodologies DOE used in conducting those analyses, and the analytical results.

II. Proposed Standards

When considering proposed standards, the new or amended energy conservation standard that DOE adopts for any type (or class) of covered product shall be designed to achieve the maximum improvement in energy efficiency that the Secretary determines is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A)) In determining whether a standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens to the greatest extent practicable, in light of the seven statutory factors set forth in EPCA. (42 U.S.C. 6295(o)(2)(B)(i)) The new or amended standard must also result in significant conservation of energy. (42 U.S.C. 6295(o)(3)(B))

DOE considered the impacts of standards at each trial standard level (TSL), beginning with the maximum technologically feasible (max-tech) level, to determine whether that level was economically justified. Where the max-tech level was not economically justified, DOE then considered the next most efficient level and undertook the same evaluation until it reached the highest efficiency level that is both technologically feasible and

[2] DOE Docket No. EERE–2009–BT–STD–0022, Comment 1.3.001; DOE Docket No. EERE–2008–BT–STD–0006, Comment 47.

economically justified and saves a significant amount of energy.

To aid the reader as DOE discusses the benefits and/or burdens of each TSL, DOE has included tables that present a summary of the results of DOE's quantitative analysis for each TSL. In addition to the quantitative results presented in the tables, DOE also considers other burdens and benefits that affect economic justification. These include the impacts on identifiable subgroups of consumers, such as low-income households and seniors, who may be disproportionately affected by an amended national standard. Section V.B.1 of the direct final rule published elsewhere in today's **Federal Register** presents the estimated impacts of each TSL for these subgroups.

1. Benefits and Burdens of TSLs Considered for Residential Furnace, Central Air Conditioner, and Heat Pump Energy Efficiency

Table II.1 through Table II.5 present summaries of the quantitative impacts estimated for each TSL for residential furnace, central air conditioner, and heat pump energy efficiency. The efficiency levels contained in each TSL are described in section V.A of the direct final rule.

TABLE II.1—SUMMARY OF RESULTS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP ENERGY EFFICIENCY TSLS: NATIONAL IMPACTS

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5	TSL 6	TSL 7
National Energy Savings (quads)	0.18	2.32 to 2.91	2.97 to 3.84	3.20 to 4.22	3.89	5.91	19.18.
NPV of Consumer Benefits (2009$ billion)							
3% discount rate	0.76	10.61 to 11.56	13.35 to 15.29	14.73 to 17.55	15.69	8.18	(45.12).
7% discount rate	0.23	2.60 to 2.41	3.36 to 3.36	3.93 to 4.21	3.47	(2.56)	(44.98).
Cumulative Emissions Reduction							
CO_2 (million metric tons)	15.2	62.8 to 61.2	971.1 to 113	105 to 134	116	200	772.
NO_X (thousand tons)	12.3	55.5 to 56.7	83.1 to 98.5	90.1 to 117	102	168	640.
Hg (tons)	0.022	0.011 to (0.012)	0.086 to 0.059	0.097 to 0.071	0.059	0.270	1.160.
Value of Emissions Reductions							
CO_2 (2009$ billion)*	0.065 to 1.013	0.320 to 5.49	0.496 to 9.58	0.530 to 11.03	0.596 to 9.90	0.987 to 16.21	3.93 to 65.09.
NO_X—3% discount rate (2009$ million).	3.4 to 35.3	17.9 to 188	26.4 to 322	28.5 to 380	32.3 to 332	52.2 to 536	203 to 2082.
NO_X—7% discount rate (2009$ million).	1.7 to 17.0	6.8 to 72.3	10.3 to 126	11.9 to 160	12.7 to 131	21.2 to 218	79.8 to 820.
Generation Capacity Reduction (GW)**.	0.397	0.646 to 1.12	3.61 to 3.53	3.81 to 3.69	3.56	10.5	35.6.
Employment Impacts							
Changes in Domestic Production Workers in 2016 (thousands).	0.1 to (16.9)	0.3 to (16.9)	0.6 to (16.9)	0.8 to (16.9)	1 to (16.9)	1.1 to (16.9)	1.2 to (16.9).
Indirect Domestic Jobs (thousands)**	0.5	2.7	6.1	6.3	6.3	18.5	81.4.

Parentheses indicate negative (−) values.
* Range of the economic value of CO_2 reductions is based on estimates of the global benefit of reduced CO_2 emissions.
** Changes in 2045.

TABLE II.2—SUMMARY OF RESULTS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP ENERGY EFFICIENCY TSLS: MANUFACTURER IMPACTS

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5	TSL 6	TSL 7
Manufacturer Impacts							
Change in Industry NPV (2009$ million).	8 to 33	(324) to (498)	(428) to (729)	(478) to (900)	(508) to (915)	(680) to (1873)	(1530) to (3820).
Industry NPV (% change)	0.4 to 0.1	(3.8) to (5.9)	(5.0) to (8.6)	(5.6) to (10.6)	(6.0) to (10.8)	(8.0) to (22.0)	(18.0) to (45.0).

Parentheses indicate negative (−) values.

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Table II.3. Summary of Results for Residential Furnace, Central Air Conditioner, and Heat Pump Energy Efficiency TSLs: Consumer LCC Savings and Payback Period

Non-Weatherized Gas Furnaces	n/a						
North		215	155	155	323	323	198
South		n/a	n/a	n/a	n/a	n/a	(181)
Mobile Home Gas Furnaces	n/a						
North		n/a	419	419	585	585	585
South		n/a	n/a	n/a	n/a	n/a	391
Oil-Fired Furnaces	n/a	n/a	15	15	(18)	(18)	272
Split-System Air Conditioners (coil-only)	55						
Rest of Country		(8)	n/a	n/a	n/a	(26)	(1,343)
Hot-Humid		86	93	93	93	(303)	(797)
Hot-Dry		104	107	107	107	(468)	(1,182)
Split-System Air Conditioners (blower-coil)	46						
Rest of Country		(18)	n/a	n/a	n/a	(30)	(903)
Hot-Humid		77	89	89	89	177	(130)
Hot-Dry		90	101	101	101	196	(311)
Split-System Heat Pumps	71						
Rest of Country		5	4	4	4	(89)	(604)
Hot-Humid		82	102	102	102	137	103
Hot-Dry		148	175	175	175	274	477
Single-Package Air Conditioners	n/a	n/a	37	37	37	(68)	(492)
Single-Package Heat Pumps	n/a	n/a	104	104	104	15	(363)
SDHV Air Conditioners	n/a						
Rest of Country		n/a	n/a	n/a	n/a	(202)	(294)
Hot-Humid		n/a	n/a	n/a	n/a	(14)	(25)
Hot-Dry		n/a	n/a	n/a	n/a	(65)	(106)
Median Payback Period (years)							
Non-Weatherized Gas Furnaces	n/a						
North		7.7	10.1	10.1	9.4	9.4	17.1
South		n/a	n/a	n/a	n/a	n/a	28.9
Mobile Home Gas Furnaces	n/a						
North		n/a	10.7	10.7	11.5	11.5	11.5
South		n/a	n/a	n/a	n/a	n/a	13
Oil-Fired Furnaces	n/a	n/a	1.0	1.0	19.8	19.8	18.2
Split-System Air Conditioners (coil-only)	9						
Rest of Country		23	n/a	n/a	n/a	33	100
Hot-Humid		6	7	7	7	34	47
Hot-Dry		8	10	10	10	49	71
Split-System Air Conditioners (blower-coil)	11						
Rest of Country		26	n/a	n/a	n/a	28	100
Hot-Humid		7	8	8	8	8	21
Hot-Dry		10	11	11	11	11	31
Split-System Heat Pumps	7						
Rest of Country		13	13	13	13	20	33
Hot-Humid		6	6	6	6	7	13

Hot-Dry		5	5	5	5	5	9
Single-Package Air Conditioners	n/a	n/a	15	15	15	24	46
Single-Package Heat Pumps	n/a	n/a	8	8	8	14	21
SDHV Air Conditioners	n/a						
Rest of Country		n/a	n/a	n/a	n/a	74	75
Hot-Humid		n/a	n/a	n/a	n/a	18	17
Hot-Dry		n/a	n/a	n/a	n/a	26	23

* TSL 1 does not include regional standards.

** Calculation of LCC savings or payback period is not applicable (n/a) in some cases because no consumers are impacted at some of the TSLs. A negative value (indicated by parentheses) means an increase in LCC by the amount indicated.

Table II.4. Summary of Results for Residential Furnace, Central Air Conditioner, and Heat Pump Energy Efficiency TSLs: Distribution of Consumer LCC Impacts (Central Air Conditioners and Heat Pumps)

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5	TSL 6	TSL 7
Distribution of Consumer LCC Impacts							
Split-System Air Conditioners (coil-only)							
Rest of Country							
Net Cost (%)	11*	17	0	0	0	57	99
No Impact (%)	75*	75	100	100	100	27	0
Net Benefit (%)	14*	8	0	0	0	16	1
Hot-Humid							
Net Cost (%)		7	26	26	26	72	90
No Impact (%)		75	27	27	27	16	0
Net Benefit (%)		18	47	47	47	12	10
Hot-Dry							
Net Cost (%)		11	37	37	37	75	91
No Impact (%)		75	27	27	27	16	0
Net Benefit (%)		14	36	36	36	10	9
Split-System Air Conditioners (blower-coil)							
Rest of Country							
Net Cost (%)	9*	14	0	0	0	43	96
No Impact (%)	82*	82	100	100	100	45	1
Net Benefit (%)	9*	4	0	0	0	12	3
Hot-Humid							
Net Cost (%)		6	21	21	21	24	70
No Impact (%)		82	45	45	45	37	1
Net Benefit (%)		12	34	34	34	39	29
Hot-Dry							
Net Cost (%)		9	28	28	28	33	76
No Impact (%)		82	45	45	45	37	1
Net Benefit (%)		9	27	27	27	30	23
Split-System Heat Pumps							
Rest of Country							
Net Cost (%)	5*	9	35	35	35	58	87
No Impact (%)	86*	86	45	45	45	23	0
Net Benefit (%)	9*	5	20	20	20	19	13
Hot-Humid							
Net Cost (%)		4	17	17	17	29	60
No Impact (%)		86	45	45	45	23	0
Net Benefit (%)		10	38	38	38	48	40
Hot-Dry							
Net Cost (%)		4	15	15	15	25	51
No Impact (%)		86	45	45	45	23	0
Net Benefit (%)		11	40	40	40	52	49
Single-Package Air Conditioners (Nation)							
Net Cost (%)	0*	0	50	50	50	72	84
No Impact (%)	100*	100	17	17	17	1	0
Net Benefit (%)	0*	0	33	33	33	27	16

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5	TSL 6	TSL 7
Single-Package Heat Pumps (Nation)							
Net Cost (%)	0*	0	29	29	29	63	79
No Impact (%)	100*	100	36	36	36	2	0
Net Benefit (%)	0*	0	35	35	35	35	21
SDHV Air Conditioners							
Rest of Country							
Net Cost (%)	0*	0	0	0	0	95	92
No Impact (%)	100*	100	100	100	100	0	0
Net Benefit (%)	0*	0	0	0	0	5	8
Hot-Humid							
Net Cost (%)		0	0	0	0	68	67
No Impact (%)		100	100	100	100	0	0
Net Benefit (%)		0	0	0	0	32	33
Hot-Dry							
Net Cost (%)		0	0	0	0	74	74
No Impact (%)		100	100	100	100	0	0
Net Benefit (%)		0	0	0	0	26	26

* Results refer to Nation for TSL 1.

Table II.5 Summary of Results for Residential Furnace, Central Air Conditioner, and Heat Pump Energy Efficiency TSLs: Distribution of Consumer LCC Impacts (Furnaces)

Category	TSL 1	TSL 2	TSL 3	TSL 4	TSL 5	TSL 6	TSL 7
Distribution of Consumer LCC Impacts							
Non-Weatherized Gas Furnaces							
North							
Net Cost (%)	0*	11	10	10	23	23	59
No Impact (%)	100*	56	71	71	23	23	1
Net Benefit (%)	0*	33	19	19	54	54	41
South							
Net Cost (%)		0	0	0	0	0	72
No Impact (%)		100	100	100	100	100	0
Net Benefit (%)		0	0	0	0	0	27
Mobile Home Gas Furnaces							
North							
Net Cost (%)	0*	0	44	44	46	46	46
No Impact (%)	100*	100	10	10	8	8	8
Net Benefit (%)	0*	0	47	47	46	46	46
South							
Net Cost (%)		0	0	0	0	0	51
No Impact (%)		100	100	100	100	100	4
Net Benefit (%)		0	0	0	0	0	45
Oil-Fired Furnaces (Nation)							
Net Cost (%)	0	0	10	10	35	35	51
No Impact (%)	100	100	58	58	33	33	1
Net Benefit (%)	0	0	32	32	33	33	48

* Results refer to Nation for TSL 1.

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DOE first considered TSL 7, which represents the max-tech efficiency levels. TSL 7 would save 19.18 quads of energy, an amount DOE considers significant. Under TSL 7, the NPV of consumer benefit would be −$44.98 billion, using a discount rate of 7 percent, and −$45.12 billion, using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 7 are 772 Mt of CO_2, 640 thousand tons of NO_X, and 1.160 ton of Hg. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 7 ranges from $3.93 billion to $65.1 billion. Total generating capacity in 2045 is estimated to decrease by 35.6 GW under TSL 7.

At TSL 7, the average LCC impact is a savings (LCC decrease) of $198 for non-weatherized gas furnaces in the northern region and a cost (LCC increase) of $181 in the southern region; a savings of $585 for mobile home gas furnaces in the northern region and a savings of $391 in the southern region; and a savings of $272 for oil-fired furnaces.

For split-system air conditioners (coil-only), the average consumer LCC impact is a cost of $1,343 in the rest of country, a cost of $797 in the hot-humid region, and a cost of $1,182 in the hot-dry region. For split-system air conditioners (blower-coil), the average LCC impact is a cost of $903 in the rest of country, a cost of $130 in the hot-humid region, and a cost of $311 in the hot-dry region.

For split-system heat pumps, the average LCC impact is a cost of $604 in the rest of country, a savings of $103 in the hot-humid region, and a savings of $477 in the hot-dry region. For single-package air conditioners, the average LCC impact is a cost of $492. For single-package heat pumps, the average LCC impact is a cost of $363. For SDHV air conditioners, the average LCC impact is a cost of $294 in the rest of country, a cost of $25 in the hot-humid region, and a cost of $106 in the hot-dry region.

At TSL 7, the median payback period for non-weatherized gas furnaces is 17.1 years in the northern region and 28.9 years in the southern region; 11.5 years for mobile home gas furnaces in the northern region and 13 years in the southern region; and 18.2 years for oil-fired furnaces.

For split-system air conditioners (coil-only), the median payback period is 100 years in the rest of country, 47 years in the hot-humid region, and 71 years in the hot-dry region. For split-system air conditioners (blower-coil), the median payback period is 100 years in the rest of country, 21 years in the hot-humid region, and 31 years in the hot-dry region. For split-system heat pumps, the median payback period is 33 years in the rest of country, 13 years in the hot-humid region, and 9 years in the hot-dry region. For single-package air conditioners, the median payback period is 46 years. For single-package heat pumps, the median payback period is 21 years. For SDHV air conditioners, the median payback period is 75 years in the rest of country, 17 years in the hot-humid region, and 23 years in the hot-dry region.

At TSL 7, the fraction of consumers experiencing an LCC benefit is 41 percent for non-weatherized gas furnaces in the northern region and 27 percent in the southern region; 46 percent for mobile home gas furnaces in the northern region and 45 percent in the southern region; and 48 percent for oil-fired furnaces.

For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC benefit at TSL 7 is 1 percent in the rest of country, 10 percent in the hot-humid region, and 9 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC benefit is 3 percent in the rest of country, 29 percent in the hot-humid region, and 23 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC benefit is 13 percent in the rest of country, 40 percent in the hot-humid region, and 49 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC benefit is 16 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC benefit is 21 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC benefit is 8 percent in the rest of country, 33 percent in the hot-humid region, and 26 percent in the hot-dry region.

At TSL 7, the fraction of consumers experiencing an LCC cost is 59 percent for non-weatherized gas furnaces in the northern region and 72 percent in the southern region; 46 percent for mobile home gas furnaces in the northern region and 51 percent in the southern region; and 51 percent for oil-fired furnaces.

For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC cost is 99 percent in the rest of country, 90 percent in the hot-humid region, and 91 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC cost is 96 percent in the rest of country, 70 percent in the hot-humid region, and 76 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC cost is 87 percent in the rest of country, 60 percent in the hot-humid region, and 51 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC cost is 84 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC cost is 79 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC cost is 92 percent in the rest of country, 67 percent in the hot-humid region, and 74 percent in the hot-dry region.

At TSL 7, the projected change in INPV ranges from a decrease of $1,530 million to a decrease of $3,820 million. At TSL 7, DOE recognizes the risk of large negative impacts if manufacturers' expectations concerning reduced profit margins are realized. If the high end of the range of impacts is reached as DOE expects, TSL 7 could result in a net loss of 45.0 percent in INPV to furnace, central air conditioner, and heat pump manufacturers.

The Secretary preliminarily concludes that at TSL 7 for furnace, central air conditioner, and heat pump energy efficiency, the benefits of energy savings, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions would be outweighed by the negative NPV of consumer benefits, the economic burden on a significant fraction of consumers due to the large increases in product cost, and the capital conversion costs and profit margin impacts that could result in a very large reduction in INPV for the manufacturers. Consequently, the Secretary has concluded that TSL 7 is not economically justified.

DOE then considered TSL 6. TSL 6 would save 5.91 quads of energy, an amount DOE considers significant. Under TSL 6, the NPV of consumer benefit would be −$2.56 billion, using a discount rate of 7 percent, and $8.18 billion, using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 6 are 200 Mt of CO_2, 168 thousand tons of NO_X, and 0.270 ton of Hg. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 6 ranges from $0.987 billion to $16.2 billion. Total generating capacity in 2045 is estimated to decrease by 10.5 GW under TSL 6.

At TSL 6, the average LCC impact is a savings (LCC decrease) of $323 for non-weatherized gas furnaces in the northern region and not applicable in the south, a savings of $585 for mobile home gas furnaces in the northern region and not applicable in the south, and a cost of $18 for oil-fired furnaces.

For split-system air conditioners (coil-only), the average LCC impact is a cost of $26 in the rest of country, a cost of $303 in the hot-humid region, and a cost of $468 in the hot-dry region. For split-system air conditioners (blower-coil), the average LCC impact is a cost of $30 in the rest of country, a savings of $177 in the hot-humid region, and a savings of $196 in the hot-dry region. For split-system heat pumps, the average LCC impact is a cost of $89 in the rest of country, a savings of $137 in the hot-humid region, and a savings of $274 in the hot-dry region. For single-package air conditioners, the average LCC impact is a cost of $68. For single-package heat pumps the average LCC impact is a savings of $15. For SDHV air conditioners, the average LCC impact is a cost of $202 in the rest of country, a cost of $14 in the hot-humid region, and a cost of $65 in the hot-dry region.

At TSL 6, the median payback period is 9.4 years for non-weatherized gas furnaces in the northern region and not applicable in the south; 11.5 years for mobile home gas furnaces in the northern region and not applicable in the south; and 19.8 years for oil-fired furnaces.

For split-system air conditioners (coil-only), the median payback period is 33 years in the rest of country, 34 years in the hot-humid region, and 49 years in the hot-dry region. For split-system air conditioners (blower-coil), the median payback period is 28 years in the rest of

country, 8 years in the hot-humid region, and 11 years in the hot-dry region. For split-system heat pumps, the median payback period is 20 years in the rest of country, 7 years in the hot-humid region, and 5 years in the hot-dry region. For single-package air conditioners, the median payback period is 24 years. For single-package heat pumps, the median payback period is 14 years. For SDHV air conditioners, the median payback period is 74 years in the rest of country, 18 years in the hot-humid region, and 26 years in the hot-dry region.

At TSL 6, the fraction of consumers experiencing an LCC benefit is 54 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south; 46 percent for mobile home gas furnaces in the northern region and 0 percent in the south; and 33 percent for oil-fired furnaces.

For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC benefit is 16 percent in the rest of country, 12 percent in the hot-humid region, and 9 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC benefit is 12 percent in the rest of country, 39 percent in the hot-humid region, and 31 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC benefit is 19 percent in the rest of country, 48 percent in the hot-humid region, and 52 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC benefit is 27 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC benefit is 35 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC benefit is 5 percent in the rest of country, 32 percent in the hot-humid region, and 26 percent in the hot-dry region.

At TSL 6, the fraction of consumers experiencing an LCC cost is 23 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south; 46 percent for mobile home gas furnaces in the northern region and 0 percent in the south; and 35 percent for oil-fired furnaces.

For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC cost is 56 percent in the rest of country, 73 percent in the hot-humid region, and 75 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC cost is 43 percent in the rest of country, 25 percent in the hot-humid region, and 33 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC cost is 58 percent in the rest of country, 29 percent in the hot-humid region, and 25 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC cost is 72 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC cost is 63 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC cost is 95 percent in the rest of country, 68 percent in the hot-humid region, and 74 percent in the hot-dry region.

At TSL 6, the projected change in INPV ranges from a decrease of $680 million to a decrease of $1,873 million. At TSL 6, DOE recognizes the risk of negative impacts if manufacturers' expectations concerning reduced profit margins are realized. If the high end of the range of impacts is reached as DOE expects, TSL 6 could result in a net loss of 22.0 percent in INPV to furnace, central air conditioner, and heat pump manufacturers.

The Secretary preliminarily concludes that at TSL 6 for furnace and central air conditioner and heat pump energy efficiency, the benefits of energy savings, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions would be outweighed by the negative NPV of consumer benefits, the economic burden on a significant fraction of consumers due to the increases in installed product cost, and the capital conversion costs and profit margin impacts that could result in a very large reduction in INPV for the manufacturers. Consequently, the Secretary has concluded that TSL 6 is not economically justified.

As discussed in the direct final rule published elsewhere in today's **Federal Register**, DOE calculated a range of results for national energy savings and NPV of consumer benefit under TSL 4. Because the range of results for TSL 4 overlaps with the results for TSL 5, and because TSLs 4 and 5 are similar in many aspects, DOE discusses the benefits and burdens of TSLs 4 and 5 together below.

TSL 5 would save 3.98 quads of energy, an amount DOE considers significant. TSL 4 would save 3.20 to 4.22 quads of energy, an amount DOE considers significant. Under TSL 5, the NPV of consumer benefit would be $3.47 billion, using a discount rate of 7 percent, and $15.69 billion, using a discount rate of 3 percent. Under TSL 4, the NPV of consumer benefit would be $3.93 billion to $4.21 billion, using a discount rate of 7 percent, and $14.73 billion to $17.55 billion, using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 5 are 116 Mt of CO_2, 102 thousand tons of NO_X, and 0.059 ton of Hg. The cumulative emissions reductions at TSL 4 are 105 to 134 Mt of CO_2, 90.1 to 117 thousand tons of NO_X, and 0.097 to 0.071 [3] ton of Hg. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 5 ranges from $0.596 billion to $9.90 billion. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 4 ranges from $0.530 billion to $11.0 billion. Total generating capacity in 2045 is estimated to decrease by 3.56 GW under TSL 5, and by 3.81 to 3.69 GW under TSL 4.

At TSL 5, the average LCC impact is a savings (LCC decrease) of $323 for non-weatherized gas furnaces in the northern region and not applicable in the south; a savings of $585 for mobile home gas furnaces in the northern region and not applicable in the south; and a cost of $18 for oil-fired furnaces. At TSL 4, the average LCC impact is a savings of $155 for non-weatherized gas furnaces in the northern region and not applicable in the south, a savings of $419 for mobile home gas furnaces in the northern region and not applicable in the south, and a savings of $15 for oil-fired furnaces.

For central air conditioners and heat pumps, the average LCC impacts for TSL 5 and TSL 4 are the same. For split-system air conditioners (coil-only), the average LCC impact is not applicable in the rest of country, but is a savings of $93 in the hot-humid region, and a savings of $107 in the hot-dry region. For split-system air conditioners (blower-coil), the average LCC impact is not applicable in the rest of country, but is a savings of $89 in the hot-humid region, and a savings of $101 in the hot-dry region. For split-system heat pumps, the average LCC impact is a savings of $4 in the rest of country, a savings of $102 in the hot-humid region, and a savings of $175 in the hot-dry region. For single-package air conditioners, the average LCC impact is a cost of $37. For single-package heat pumps, the average

[3] DOE presents ranges of values throughout the document when analyzing multiple scenarios. For consistency, DOE presents the ranges in order of a first scenario followed by a second scenario, and then maintains the same order of scenarios when presenting results throughout the document, regardless of whether the values are arranged in order of lowest to highest. In certain cases in this document when DOE presents a range of impacts, the results do not go from a lower value to a higher value (as would normally be expected) because DOE presents the values in a manner that they are consistent with the presentation of the rest of the results for those scenarios.

LCC impact is a cost of $104. For SDHV air conditioners, the average LCC impact is not applicable for all regions.

At TSL 5, the median payback period is 9.4 years for non-weatherized gas furnaces in the northern region and not applicable in the south, 11.5 years for mobile home gas furnaces in the northern region and not applicable in the south, and 19.8 years for oil-fired furnaces. At TSL 4, the median payback period is 10.1 years for non-weatherized gas furnaces in the northern region and not applicable in the south, 10.7 years for mobile home gas furnaces in the northern region and not applicable in the south, and 1.0 year for oil-fired furnaces.

For central air conditioners and heat pumps, the median payback periods for TSL 5 and TSL 4 are the same. For split-system air conditioners (coil-only), the median payback period is not applicable in the rest of country, 7 years in the hot-humid region, and 10 years in the hot-dry region. For split-system air conditioners (blower-coil), the median payback period is not applicable in the rest of country, 8 years in the hot-humid region, and 11 years in the hot-dry region. For split-system heat pumps, the median payback period is 13 years in the rest of country, 6 years in the hot-humid region, and 5 years in the hot-dry region. For single-package air conditioners, the median payback period is 15 years. For single-package heat pumps, the median payback period is 8 years. For SDHV air conditioners, the median payback period is not applicable in all regions.

At TSL 5, the fraction of consumers experiencing an LCC benefit is 54 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south, 46 percent for mobile home gas furnaces in the northern region and 0 percent in the south, and 33 percent for oil-fired furnaces. At TSL 4, the fraction of consumers experiencing an LCC benefit is 19 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south, 47 percent for mobile home gas furnaces in the northern region and 0 percent in the south, and 32 percent for oil-fired furnaces.

For central air conditioners and heat pumps, at TSL 5 and at TSL 4, the fraction of consumers experiencing an LCC benefit is the same. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC benefit is 0 percent in the rest of country, 46 percent in the hot-humid region, and 36 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC benefit is 0 percent in the rest of country, 34 percent in the hot-humid region, and 27 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC benefit is 20 percent in the rest of country, 38 percent in the hot-humid region, and 40 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC benefit is 33 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC benefit is 35 percent. For SDHV air conditioners, no consumers experience an LCC benefit in any of the regions.

At TSL 5, the fraction of consumers experiencing an LCC cost is 23 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south, 46 percent for mobile home gas furnaces in the northern region and 0 percent in the south, and 35 percent for oil-fired furnaces. At TSL 4, the fraction of consumers experiencing an LCC cost is 10 percent for non-weatherized gas furnaces in the northern region and 0 percent in the south, 44 percent for mobile home gas furnaces in the northern region and 0 percent in the south, and 10 percent for oil-fired furnaces.

For central air conditioners and heat pumps, at TSL 5 and at TSL 4, the fraction of consumers experiencing an LCC cost is the same. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC cost is 0 percent in the rest of country, 26 percent in the hot-humid region, and 37 percent in the hot-dry region. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC cost is 0 percent in the rest of country, 21 percent in the hot-humid region, and 28 percent in the hot-dry region. For split-system heat pumps, the fraction of consumers experiencing an LCC cost is 35 percent in the rest of country, 17 percent in the hot-humid region, and 15 percent in the hot-dry region. For single-package air conditioners, the fraction of consumers experiencing an LCC cost is 37 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC cost is 29 percent. For SDHV air conditioners, no consumers experience an LCC cost in any of the regions.

At TSL 5, the projected change in INPV ranges from a decrease of $508 million to a decrease of $915 million. At TSL 5, DOE recognizes the risk of negative impacts if manufacturers' expectations concerning reduced profit margins are realized. If the high end of the range of impacts is reached as DOE expects, TSL 5 could result in a net loss of 10.8 percent in INPV to furnace, central air conditioner, and heat pump manufacturers. At TSL 4, the projected change in INPV ranges from a net loss of $478 million to a net loss of $900 million. At TSL 4, DOE recognizes the risk of negative impacts if manufacturers' expectations concerning reduced profit margins are realized. If the high end of the range of impacts is reached as DOE expects, TSL 4 could result in a net loss of 10.6 percent in INPV to furnace, central air conditioner, and heat pump manufacturers.

The Secretary preliminarily concludes that at TSL 5 for furnace and central air conditioner and heat pump energy efficiency, the benefits of energy savings, positive NPV of consumer benefits, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions are outweighed by the economic burden on some consumers due to large increases in installed cost, and the capital conversion costs and profit margin impacts that could result in a large reduction in INPV for the manufacturers. Consequently, the Secretary has concluded that TSL 5 is not economically justified.

The Secretary preliminarily concludes that at TSL 4 for furnace and central air conditioner and heat pump energy efficiency, the benefits of energy savings, positive NPV of consumer benefits, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions would outweigh the economic burden on some consumers due to increases in installed cost, and the capital conversion costs and profit margin impacts that could result in a moderate reduction in INPV for the manufacturers. TSL 4 may yield greater cumulative energy savings than TSL 5, and also a higher NPV of consumer benefits at both 3-percent and 7-percent discount rates.

In addition, the efficiency levels in TSL 4 correspond to the recommended levels in the consensus agreement, which DOE believes sets forth a statement by interested persons that are fairly representative of relevant points of view (including representatives of manufacturers of covered products, States, and efficiency advocates) and contains recommendations with respect to an energy conservation standard that are in accordance with 42 U.S.C. 6295(o). Moreover, DOE has encouraged the submission of consensus agreements as a way to get diverse stakeholders together, to develop an independent and probative analysis useful in DOE standard setting, and to expedite the rulemaking process. In the present case,

one outcome of the consensus agreement was a recommendation to accelerate the compliance dates for these products, which would have the effect of producing additional energy savings at an earlier date. DOE also believes that standard levels recommended in the consensus agreement may increase the likelihood for regulatory compliance, while decreasing the risk of litigation.

After considering the analysis, comments to the furnaces RAP and the preliminary TSD for central air conditioners and heat pumps, and the benefits and burdens of TSL 4, the Secretary has tentatively concluded that this trial standard level offers the maximum improvement in efficiency that is technologically feasible and economically justified, and will result in significant conservation of energy. Therefore, DOE today adopts TSL 4 for furnaces and central air conditioners and heat pumps. Today's amended energy conservation standards for furnaces, central air conditioners, and heat pumps, expressed in terms of minimum energy efficiency, are shown in Table II.6.

TABLE II.6—PROPOSED STANDARDS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP ENERGY EFFICIENCY

Product class	Proposed national standard levels	Proposed northern region ** standard levels
Residential Furnaces *		
Non-weatherized gas	AFUE = 80%	AFUE = 90%.
Mobile home gas	AFUE = 80%	AFUE = 90%.
Non-weatherized oil-fired	AFUE = 83%	AFUE = 83%.
Weatherized gas	AFUE = 81%	AFUE = 81%.
Mobile home oil-fired ‡‡	AFUE = 75%	AFUE = 75%.
Weatherized oil-fired ‡‡	AFUE = 78%	AFUE = 78%.
Electric ‡‡	AFUE = 78%	AFUE = 78%.

Product Class	Proposed national standard levels	Proposed southeastern (hot-humid) region † †standard levels	Proposed southwestern (hot-dry) region ‡ standard levels
Central Air Conditioners and Heat Pumps †			
Split-system air conditioners	SEER = 13	SEER = 14	SEER = 14 EER = 12.2 (for units with a rated cooling capacity less than 45,000 Btu/h) EER = 11.7 (for units with a rated cooling capacity equal to or greater than 45,000 Btu/h).
Split-system heat pumps	SEER = 14 HSPF = 8.2	SEER = 14 HSPF = 8.2	SEER = 14. HSPF = 8.2.
Single-package air conditioners	SEER = 14	SEER = 14	SEER = 14 EER = 11.0.
Single-package heat pumps	SEER = 14 HSPF = 8.0	SEER = 14 HSPF = 8.0	SEER = 14. HSPF = 8.0.
Small-duct, high-velocity systems	SEER = 13 HSPF = 7.7	SEER = 13 HSPF = 7.7	SEER = 13. HSPF = 7.7.
Space-constrained products—air conditioners ‡‡	SEER = 12	SEER = 12	SEER = 12.
Space-constrained products—heat pumps ‡‡	SEER = 12 HSPF = 7.4	SEER = 12 HSPF = 7.4	SEER = 12. HSPF = 7.4.

* AFUE is Annual Fuel Utilization Efficiency.

** The Northern region for furnaces contains the following States: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

† SEER is Seasonal Energy Efficiency Ratio; EER is Energy Efficiency Ratio; HSPF is Heating Seasonal Performance Factor; and Btu/h is British Thermal Units per hour.

†† The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.

‡ The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.

‡‡ DOE is not proposing to amend the energy conservation standards for these product classes in this NOPR.

2. Benefits and Burdens of TSLs Considered for Residential Furnace, Central Air Conditioner, and Heat Pump Standby Mode and Off Mode Power

Table II.7 through Table II.9 present a summary of the quantitative impacts estimated for each TSL considered for furnace, central air conditioner, and heat pump standby mode and off mode power. The efficiency levels contained in each TSL are described in section V.A of the direct final rule.

TABLE II.7—SUMMARY OF RESULTS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP STANDBY MODE AND OFF MODE POWER TSLS: NATIONAL IMPACTS

Category	TSL 1	TSL 2	TSL 3
National Energy Savings (quads)	0.153	0.160	0.186.
NPV of Consumer Benefits (2009$ billion)			
3% discount rate	1.14	1.18	1.01.
7% discount rate	0.371	0.373	0.235.
Cumulative Emissions Reduction			
CO_2 (million metric tons)	8.23	8.73	10.1.
NO_X (thousand tons)	6.60	7.00	8.11.
Hg (ton)	0.056	0.072	0.079.
Value of Cumulative Emissions Reduction			
CO_2 (2009$ million)*	41.7 to 694	44.3 to 738	51.7 to 862.
NO_X – 3% discount rate (2009$ million)	2.07 to 21.3	2.20 to 22.6	2.56 to 26.3.
NO_X – 7% discount rate (2009$ million)	0.793 to 8.15	0.841 to 8.65	0.975 to 10.0.
Generation Capacity Reduction (GW)**	0.103	0.110	0.127.
Employment Impacts			
Total Potential Change in Domestic Production Workers in 2016 (thousands).	negligible	negligible	negligible.
Indirect Domestic Jobs (thousands)**	0.80	0.86	1.02.

Parentheses indicate negative (–) values.
* Range of the economic value of CO_2 reductions is based on estimates of the global benefit of reduced CO_2 emissions.
** Changes in 2045.

TABLE II.8—SUMMARY OF RESULTS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP STANDBY MODE AND OFF MODE POWER TSLS: MANUFACTURER AND CONSUMER IMPACTS

Category	TSL 1	TSL 2	TSL 3
Manufacturer Impacts			
Change in Industry NPV (2009$ million)	4 to (253)	5 to (253)	23 to (255).
Industry NPV (% change)	0.05 to (2.91)	0.06 to (2.91)	0.26 to (2.93).
Consumer Mean LCC Savings* (2009$)			
Non-Weatherized Gas Furnaces	2	2	0.
Mobile Home Gas Furnaces	0	0	(1).
Oil-Fired Furnaces	1	1	1.
Electric Furnaces	0	0	(1).
Split-System Air Conditioners (coil-only)	84	84	84.
Split-System Air Conditioners (blower-coil)	84	40	35.
Split-System Heat Pumps	9	9	(1).
Single-Package Air Conditioners	84	41	36.
Single-Package Heat Pumps	9	9	(1).
SDHV Air Conditioners	84	37	32.
Space-Constrained Air Conditioners	84	42	37.
Space-Constrained Heat Pumps	9	9	(1).
Consumer Median PBP (years)			
Non-Weatherized Gas Furnaces	11	11	16.
Mobile Home Gas Furnaces	12	12	18.
Oil-Fired Furnaces	8	8	12.
Electric Furnaces	10	10	16.
Split-System Air Conditioners (coil-only)	1	1	1.
Split-System Air Conditioners (blower-coil)	1	6	7.
Split-System Heat Pumps	4	4	5.
Single-Package Air Conditioners	1	6	7.
Single-Package Heat Pumps	4	4	5.
SDHV Air Conditioners	1	7	7.
Space-Constrained Air Conditioners	1	6	7.
Space-Constrained Heat Pumps	4	4	5.

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

TABLE II.9—SUMMARY OF RESULTS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP STANDBY MODE AND OFF MODE POWER TSLS: DISTRIBUTION OF CONSUMER IMPACTS

Category	TSL 1	TSL 2	TSL 3
Distribution of Consumer LCC Impacts			
Non-Weatherized Gas Furnaces			
Net Cost (%)	9	9	17
No Impact (%)	72	72	72
Net Benefit (%)	18	18	11
Mobile Home Gas Furnaces			
Net Cost (%)	6	6	8
No Impact (%)	91	91	91
Net Benefit (%)	4	4	2
Oil-Fired Furnaces			
Net Cost (%)	1	1	4
No Impact (%)	91	91	91
Net Benefit (%)	8	8	6
Electric Furnaces			
Net Cost (%)	4	4	7
No Impact (%)	90	90	90
Net Benefit (%)	5	5	3
Split-System Air Conditioners (coil-only)			
Net Cost (%)	0	0	0
No Impact (%)	94	94	94
Net Benefit (%)	6	6	6
Split-System Air Conditioners (blower-coil)			
Net Cost (%)	0	3	3
No Impact (%)	94	91	91
Net Benefit (%)	6	6	6
Split-System Heat Pumps			
Net Cost (%)	0	0	19
No Impact (%)	67	67	57
Net Benefit (%)	33	33	24
Single-Package Air Conditioners			
Net Cost (%)	0	3	3
No Impact (%)	94	91	91
Net Benefit (%)	6	6	6
Single-Package Heat Pumps			
Net Cost (%)	0	0	19
No Impact (%)	66	66	57
Net Benefit (%)	34	34	24
SDHV Air Conditioners			
Net Cost (%)	0	3	3
No Impact (%)	94	91	91
Net Benefit (%)	6	6	6
Space-Constrained Air Conditioners			
Net Cost (%)	0	3	3
No Impact (%)	94	91	91
Net Benefit (%)	6	6	6
Space-Constrained Heat Pumps			
Net Cost (%)	0	0	19
No Impact (%)	67	67	58
Net Benefit (%)	33	33	23

Values in the table are rounded off, and, thus, sums may not equal 100 percent in all cases.

DOE first considered TSL 3, which represents the max-tech efficiency levels. TSL 3 would save 0.186 quads of energy, an amount DOE considers significant. Under TSL 3, the NPV of consumer benefit would be $0.235 billion, using a discount rate of 7 percent, and $1.01 billion, using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 3 are 10.1 Mt of CO_2, 8.11 thousand tons of NO_X, and 0.079 ton of Hg. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 3 ranges from $51.7 million to $862 million. Total generating capacity in 2045 is estimated to decrease by 0.127 GW under TSL 3.

At TSL 3, the average LCC impact is a cost (LCC increase) of $0 for non-weatherized gas furnaces, a cost of $1 for mobile home gas furnaces, a savings of $1 for oil-fired furnaces, and a cost of $1 for electric furnaces. For split-system air conditioners (coil-only), the average LCC impact is a savings (LCC decrease) of $84. For split-system air conditioners (blower-coil), the average LCC impact is a savings of $35. For split-system heat pumps, the average LCC impact is a cost of $1. For single-package air conditioners, the average LCC impact is a savings of $36. For single-package heat pumps, the average LCC impact is a cost of $1. For SDHV air conditioners, the average LCC impact is a savings of $32. For space-constrained air conditioners, the average LCC impact is a savings of $37. For space-constrained heat pumps, the average LCC impact is a cost of $1.

At TSL 3, the median payback period is 16 years for non-weatherized gas furnaces; 18 years for mobile home gas furnaces; 12 years for oil-fired furnaces; and 16 years for electric furnaces. For

split-system air conditioners (coil-only), the median payback period is 1 year. For split-system air conditioners (blower-coil), the median payback period is 7 years. For split-system heat pumps, the median payback period is 5 years. For single-package air conditioners, the median payback period is 7 years. For single-package heat pumps, the median payback period is 5 years. For SDHV air conditioners, the median payback period is 7 years. For space-constrained air conditioners, the median payback period is 7 years. For space-constrained heat pumps, the median payback period is 5 years.

At TSL 3, the fraction of consumers experiencing an LCC benefit is 11 percent for non-weatherized gas furnaces, 2 percent for mobile home gas furnaces, 6 percent for oil-fired furnaces, and 3 percent for electric furnaces. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC benefit is 6 percent. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC benefit is 6 percent. For split-system heat pumps, the fraction of consumers experiencing an LCC benefit is 24 percent. For single-package air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC benefit is 24 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For space-constrained air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For space-constrained heat pumps, the fraction of consumers experiencing an LCC benefit is 23 percent.

At TSL 3, the fraction of consumers experiencing an LCC cost is 17 percent for non-weatherized gas furnaces, 8 percent for mobile home gas furnaces, 4 percent for oil-fired furnaces, and 7 percent for electric furnaces. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC cost is 0 percent. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC cost is 3 percent. For split-system heat pumps, the fraction of consumers experiencing an LCC cost is 19 percent. For single-package air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC cost is 19 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For space-constrained air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For space-constrained heat pumps, the fraction of consumers experiencing an LCC cost is 19 percent.

At TSL 3, the projected change in INPV ranges from an increase of $23 million to a decrease of $255 million. The model anticipates impacts on INPV to range from 0.26 percent to −2.93 percent. In general, the cost of standby mode and off mode features is not expected to significantly affect manufacturer profit margins for furnace, central air conditioner, and heat pump products.

The Secretary preliminarily concludes that at TSL 3 for furnace and central air conditioner and heat pump standby mode and off mode power, the benefits of energy savings, positive NPV of consumer benefits at 3-percent discount rate, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions would be outweighed by the negative NPV of consumer benefits at 7 percent and the economic burden on some consumers due to the increases in product cost. Of the consumers of furnaces and heat pumps who would be impacted, many more would be burdened by standards at TSL 3 than would benefit. Consequently, the Secretary has tentatively concluded that TSL 3 is not economically justified.

DOE then considered TSL 2. TSL 2 would save 0.16 quads of energy, an amount DOE considers significant. Under TSL 2, the NPV of consumer benefit would be $0.373 billion, using a discount rate of 7 percent, and $1.18 billion, using a discount rate of 3 percent.

The cumulative emissions reductions at TSL 2 are 8.73 Mt of CO_2, 7.00 thousand tons of NO_X, and 0.072 tons of Hg. The estimated monetary value of the cumulative CO_2 emissions reductions at TSL 2 ranges from $44.3 million to $738 million. Total generating capacity in 2045 is estimated to decrease by 0.11 GW under TSL 2.

At TSL 2, the average LCC impact is a savings (LCC decrease) of $2 for non-weatherized gas furnaces, a savings of $0 for mobile home gas furnaces, a savings of $1 for oil-fired furnaces, and a savings of $0 for electric furnaces. For split-system air conditioners (coil-only), the average LCC impact is a savings of $84. For split-system air conditioners (blower-coil), the average LCC impact is a savings of $40. For split-system heat pumps, the average LCC impact is a savings of $9. For single-package air conditioners, the average LCC impact is a savings of $41. For single-package heat pumps, the average LCC impact is a savings of $9. For SDHV air conditioners, the average LCC impact is a savings of $37. For space-constrained air conditioners, the average LCC impact is a savings of $42. For space-constrained heat pumps, the average LCC impact is a savings of $9.

At TSL 2, the median payback period is 11 years for non-weatherized gas furnaces; 12 years for mobile home gas furnaces; 8 years for oil-fired furnaces; and 10 years for electric furnaces. For split-system air conditioners (coil-only), the median payback period is 1 year. For split-system air conditioners (blower-coil), the median payback period is 6 years. For split-system heat pumps, the median payback period is 4 years. For single-package air conditioners, the median payback period is 6 years. For single-package heat pumps, the median payback period is 4 years. For SDHV air conditioners, the median payback period is 7 years. For space-constrained air conditioners, the median payback period is 6 years. For space-constrained heat pumps, the median payback period is 4 years.

At TSL 2, the fraction of consumers experiencing an LCC benefit is 18 percent for non-weatherized gas furnaces, 4 percent for mobile home gas furnaces, 8 percent for oil-fired furnaces, and 5 percent for electric furnaces. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC benefit is 6 percent. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an LCC benefit is 6 percent. For split-system heat pumps, the fraction of consumers experiencing an LCC benefit is 33 percent. For single-package air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC benefit is 34 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For space-constrained air conditioners, the fraction of consumers experiencing an LCC benefit is 6 percent. For space-constrained heat pumps, the fraction of consumers experiencing an LCC benefit is 33 percent.

At TSL 2, the fraction of consumers experiencing an LCC cost is 9 percent for non-weatherized gas furnaces, 6 percent for mobile home gas furnaces, 1 percent for oil-fired furnaces, and 4 percent for electric furnaces. For split-system air conditioners (coil-only), the fraction of consumers experiencing an LCC cost is 0 percent. For split-system air conditioners (blower-coil), the fraction of consumers experiencing an

LCC cost is 3 percent. For split-system heat pumps, the fraction of consumers experiencing an LCC cost is 0 percent. For single-package air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For single-package heat pumps, the fraction of consumers experiencing an LCC cost is 0 percent. For SDHV air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For space-constrained air conditioners, the fraction of consumers experiencing an LCC cost is 3 percent. For space-constrained heat pumps, the fraction of consumers experiencing an LCC cost is 0 percent.

At TSL 2, the projected change in INPV ranges from an increase of $5 million to a decrease of $253 million. The modeled impacts on INPV range from 0.06 percent to −2.91 percent. In general, the incremental cost of standby mode and off mode features are not expected to significantly affect INPV for the furnace, central air conditioner, and heat pump industry at this level.

The Secretary preliminarily concludes that at TSL 2 for furnace, central air conditioner, and heat pump standby mode and off mode power, the benefits of energy savings, positive NPV of consumer benefits at both 7-percent and 3-percent discount rates, generating capacity reductions, emission reductions, and the estimated monetary value of the CO_2 emissions reductions would outweigh the economic burden on a small fraction of consumers due to the increases in product cost. With the exception of consumers of mobile home gas furnaces (whose mean LCC impact is zero), the majority of the consumers that would be affected by standards at TSL 2 would see an LCC benefit. Consequently, the Secretary has tentatively concluded that TSL 2 is economically justified.

After considering the analysis and the benefits and burdens of TSL 2, the Secretary has preliminarily concluded that this trial standard level would offer the maximum improvement in energy efficiency that is technologically feasible and economically justified, and would result in the significant conservation of energy. Therefore, DOE is proposing TSL 2 for furnace, central air conditioner, and heat pump standby mode and off mode. The proposed energy conservation standards for standby mode and off mode, expressed as maximum power in watts, are shown in Table II.10.

TABLE II.10—PROPOSED STANDARDS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP STANDBY MODE AND OFF MODE *

Product class	Proposed standby mode and off mode standard levels
Residential Furnaces **	
Non-Weatherized Gas	$P_{W,SB}$ = 10 watts. $P_{W,OFF}$ = 10 watts.
Mobile Home Gas	$P_{W,SB}$ = 10 watts. $P_{W,OFF}$ = 10 watts.
Non-Weatherized Oil-Fired	$P_{W,SB}$ = 11 watts. $P_{W,OFF}$ = 11 watts.
Mobile Home Oil-Fired	$P_{W,SB}$ = 11 watts. $P_{W,OFF}$ = 11 watts.
Electric	$P_{W,SB}$ = 10 watts. $P_{W,OFF}$ = 10 watts.
Product class	Proposed off mode standard levels ††
Central Air Conditioners and Heat Pumps †	
Split-system air conditioners	$P_{W,OFF}$ = 30 watts.
Split-system heat pumps	$P_{W,OFF}$ = 33 watts.
Single-package air conditioners	$P_{W,OFF}$ = 30 watts.
Single-package heat pumps	$P_{W,OFF}$ = 33 watts.
Small-duct, high-velocity systems	$P_{W,OFF}$ = 30 watts.
Space-constrained air conditioners	$P_{W,OFF}$ = 30 watts.
Space-constrained heat pumps	$P_{W,OFF}$ = 33 watts.

* $P_{W,SB}$ is standby mode electrical power consumption, and $P_{W,OFF}$ is off mode electrical power consumption for furnaces.
** Standby mode and off mode energy consumption for weatherized gas and oil-fired furnaces is regulated as a part of single-package air conditioners and heat pumps, as discussed in detail in the direct final rule published elsewhere in today's **Federal Register**.
† $P_{W,OFF}$ is off mode electrical power consumption for central air conditioners and heat pumps.
†† DOE is not proposing to adopt a separate standby mode standard level for central air conditioners and heat pumps, because standby mode power consumption for these products is already regulated by SEER and HSPF.

3. Annualized Benefits and Costs of Proposed Standards for Residential Furnace, Central Air Conditioner, and Heat Pump Energy Efficiency

The benefits and costs of the proposed standards can also be expressed in terms of annualized values over the analysis period. The annualized monetary values are the sum of: (1) The annualized national economic value (expressed in 2009$) of the benefits from operating products that meet the proposed standards (consisting primarily of operating cost savings from using less energy, minus increases in equipment purchase costs, which is another way of representing consumer NPV); and (2) the monetary value of the benefits of emission reductions, including CO_2 emission reductions.[4] The value of the

[4] 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 in 2011, the year used for discounting the NPV of total consumer costs and savings, for the time-series of costs and benefits using discount rates of three and seven percent for all costs and

Continued

CO_2 reductions, otherwise known as the Social Cost of Carbon (SCC), is calculated using a range of values per metric ton of CO_2 developed by a recent Federal interagency process. The monetary costs and benefits of cumulative emissions reductions are reported in 2009$ to permit comparisons with the other costs and benefits in the same dollar units.

Although combining the values of operating savings and CO_2 reductions provides a useful perspective, two issues should be considered. First, the national operating savings are domestic U.S. consumer monetary savings that occur as a result of market transactions, while the value of CO_2 reductions is based on a global value. Second, the assessments of operating cost savings and CO_2 savings are performed with different methods that use quite different time frames for analysis. The national operating cost savings is measured for the lifetime of products shipped in 2013–2045 for furnaces and 2015–2045 for central air conditioners and heat pumps. The SCC values, on the other hand, reflect the present value of future climate-related impacts resulting from the emission of one metric ton of carbon dioxide in each year. These impacts continue well beyond 2100.

Estimates of annualized benefits and costs of the proposed standards for residential furnace, central air conditioner, and heat pump energy efficiency are shown in Table II.11. Using a 7-percent discount rate and the SCC value of $22.1/ton in 2010 (in 2009$), the cost of the energy efficiency standards in today's direct final rule is $527 million to $773 million per year in increased equipment installed costs, while the annualized benefits are $837 million to $1106 million per year in reduced equipment operating costs, $140 million to $178 million in CO_2 reductions, and $5.3 million to $6.9 million in reduced NO_X emissions. In this case, the net benefit amounts to $456 million to $517 million per year. Using a 3-percent discount rate and the SCC value of $22.1/metric ton in 2010 (in 2009$), the cost of the energy efficiency standards in today's direct final rule is $566 million to $825 million per year in increased equipment installed costs, while the benefits are $1289 million to $1686 million per year in reduced operating costs, $140 million to $178 million in CO_2 reductions, and $7.9 million to $10.2 million in reduced NO_X emissions. In this case, the net benefit amounts to $871 million to $1049 million per year.

TABLE II.11—ANNUALIZED BENEFITS AND COSTS OF PROPOSED STANDARDS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP ENERGY EFFICIENCY (TSL 4)

	Discount rate	Monetized (million 2009$/year)		
		Primary estimate *	Low estimate *	High estimate *
Benefits				
Operating Cost Savings	7%	837 to 1,106	723 to 959	955 to 1,258.
	3%	1,289 to 1,686	1,083 to 1,422	1,493 to 1,948.
CO_2 Reduction at $4.9/t **	5%	34 to 43	34 to 43	34 to 43.
CO_2 Reduction at $22.1/t **	3%	140 to 178	141 to 178	140 to 178.
CO_2 Reduction at $36.3/t **	2.5%	224 to 284	225 to 285	224 to 284.
CO_2 Reduction at $67.1/t **	3%	427 to 541	428 to 543	427 to 541.
NO_X Reduction at $2,519/ton **	7%	5.3 to 6.9	5.3 to 7.0	5.3 to 6.9.
	3%	7.9 to 10.2	7.9 to 10.3	7.9 to 10.2.
Total †	7% plus CO_2 range	876 to 1,653	762 to 1,509	994 to 1,805.
	7%	983 to 1,290	869 to 1,144	1,100 to 1,442.
	3%	1,437 to 1,874	1,232 to 1,611	1,641 to 2,136.
	3% plus CO_2 range	1,330 to 2,237	1,125 to 1,975	1,535 to 2,499.
Costs				
Incremental Product Costs	7%	527 to 773	574 to 840	555 to 819.
	3%	566 to 825	630 to 916	599 to 876.
Net Benefits/Costs				
Total †	7% plus CO_2 range	349 to 880	188 to 669	438 to 986.
	7%	456 to 517	295 to 305	545 to 623.
	3%	871 to 1,049	601 to 695	1,042 to 1,260.
	3% plus CO_2 range	764 to 1,412	494 to 1,059	935 to 1,623.

* The Primary, Low, and High Estimates utilize forecasts of energy prices and housing starts from the *AEO2010* Reference case, Low Economic Growth case, and High Economic Growth case, respectively.

** The CO_2 values represent global values (in 2009$) of the social cost of CO_2 emissions in 2010 under several scenarios. The values of $4.9, $22.1, and $36.3 per ton are the averages of SCC distributions calculated using 5-percent, 3-percent, and 2.5-percent discount rates, respectively. The value of $67.1 per ton represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_X (in 2009$) is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the SCC value calculated at a 3% discount rate, which is $22.1/ton in 2010 (in 2009$). In the rows labeled as ''7% plus CO_2 range'' and ''3% plus CO_2 range,'' the operating cost and NO_X benefits are calculated using the labeled discount rate, and those values are added to the full range of CO_2 values.

benefits except for the value of CO_2 reductions. For the latter, DOE used a range of discount rates, as shown in Table II.11. From the present value, DOE then calculated the fixed annual payment over a 32-year period, starting in 2011, that yields 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 would be a steady stream of payments.

4. Annualized Benefits and Costs of Proposed Standards for Residential Furnace, Central Air Conditioner, and Heat Pump Standby Mode and Off Mode Power

As explained above, the benefits and costs of the proposed standards for standby mode and off mode power can also be expressed in terms of annualized values. The annualized monetary values are the sum of: (1) The annualized national economic value (expressed in 2009$) of the benefits from operating products that meet the standards (consisting primarily of operating cost savings from using less energy, minus increases in equipment purchase costs, which is another way of representing consumer NPV); and (2) the monetary value of the benefits of emission reductions, including CO_2 emission reductions.

Estimates of annualized benefits and costs of the proposed standards for residential furnace, central air conditioner, and heat pump standby mode and off mode power are shown in Table II.12. Using a 7-percent discount rate and the SCC value of $22.1/ton in 2010 (in 2009$), the cost of the standby mode and off mode standards in this proposed rule is $16.4 million per year in increased equipment costs, while the annualized benefits are $46.5 million per year in reduced equipment operating costs, $12.4 million in CO_2 reductions, and $0.4 million in reduced NO_X emissions. In this case, the net benefit amounts to $42.8 million per year. Using a 3-percent discount rate and the SCC value of $22.1/ton in 2010 (in 2009$), the cost of the standby mode and off mode standards in this proposed rule is $19.1 million per year in increased equipment costs, while the benefits are $79.3 million per year in reduced operating costs, $12.4 million in CO_2 reductions, and $0.6 million in reduced NO_X emissions. In this case, the net benefit amounts to $73.2 million per year.

TABLE II.12—ANNUALIZED BENEFITS AND COSTS OF PROPOSED STANDARDS FOR RESIDENTIAL FURNACE, CENTRAL AIR CONDITIONER, AND HEAT PUMP STANDBY MODE AND OFF MODE POWER (TSL 2)

	Discount rate	Monetized (million 2009$/year)		
		Primary estimate *	Low estimate *	High estimate *
Benefits				
Operating Cost Savings	7%	46.5	40.4	52.8.
	3%	79.3	67.9	90.8.
CO_2 Reduction at $4.9/t**	5%	2.9	2.9	2.9.
CO_2 Reduction at $22.1/t**	3%	12.4	12.4	12.4.
CO_2 Reduction at $36.3/t**	2.5%	19.9	19.9	19.9.
CO_2 Reduction at $67.1/t**	3%	37.6	37.6	37.6.
NO_X Reduction at $2,519/ton**	7%	0.4	0.4	0.4.
	3%	0.6	0.6	0.6.
Total †	7% plus CO_2 range	49.7 to 84.5	43.6 to 78.4	56.1 to 90.8.
	7%	59.2	53.1	65.5.
	3%	92.3	80.9	103.8.
	3% plus CO_2 range	82.8 to 117.5	71.4 to 106.2	94.3 to 129.1.
Costs				
Incremental Product Costs	7%	16.4	15.2	17.7.
	3%	19.1	17.6	20.6.
Net Benefits/Costs				
Total †	7% plus CO_2 range	33.3 to 68.1	28.5 to 63.2	38.4 to 73.1.
	7%	42.8	38.0	47.9.
	3%	73.2	63.3	83.2.
	3% plus CO_2 range	63.7 to 98.4	53.8 to 88.5	73.7 to 108.5.

* The Primary, Low, and High Estimates utilize forecasts of energy prices and housing starts from the *AEO2010* Reference case, Low Economic Growth case, and High Economic Growth case, respectively.

**&thnsp;The CO_2 values represent global values (in 2009$) of the social cost of CO_2 emissions in 2010 under several scenarios. The values of $4.9, $22.1, and $36.3 per ton are the averages of SCC distributions calculated using 5-percent, 3-percent, and 2.5-percent discount rates, respectively. The value of $67.1 per ton represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_X (in 2009$) is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the SCC value calculated at a 3% discount rate, which is $22.1/ton in 2010 (in 2009$). In the rows labeled as ''7% plus CO_2 range'' and ''3% plus CO_2 range,'' the operating cost and NO_X benefits are calculated using the labeled discount rate, and those values are added to the full range of CO_2 values.

III. Public Participation

A. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule until the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments, data, and other information using any of the methods described in the **ADDRESSES** section at the beginning of this notice.

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

However, your contact information will be publicly viewable if you include

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

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

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

Include contact information each time you submit comments, data, documents, and other information to DOE. E-mail submissions are preferred. If you submit via mail or hand delivery/courier, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No facsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, that are written in English, and that are free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

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

Confidential business information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via e-mail, postal mail, or hand delivery/courier two well-marked copies: One copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked non-confidential with the information believed to be confidential deleted. Submit these documents via e-mail or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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

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

B. Public Meeting

As stated previously, if DOE withdraws the direct final rule published elsewhere in today's **Federal Register** pursuant to 42 U.S.C. 6295(p)(4)(C), DOE will hold a public meeting to allow for additional comment on this proposed rule. DOE will publish notice of any meeting in the **Federal Register**.

IV. Procedural Issues and Regulatory Review

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

V. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of today's proposed rule.

List of Subjects in 10 CFR Part 430

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

Issued in Washington, DC on June 6, 2011.

Henry Kelly,

Acting Assistant Secretary, Energy Efficiency and Renewable Energy.

For the reasons set forth in the preamble, DOE proposes to amend part 430 of chapter II, subchapter D, of title 10 of the Code of Federal Regulations, to read as set forth below:

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

1. The authority for part 430 continues to read as follows:

Authority: 42 U.S.C. 6291–6309; 28 U.S.C. 2461 note.

2. Section 430.23 is amended by:

a. Redesignating paragraphs (m)(4), (m)(5), and (n)(5) as paragraphs (m)(5), (m)(6), and (n)(6), respectively;

b. Adding new paragraphs (m)(4) and (n)(5); and

c. Revising paragraph (n)(2).

The additions and revision read as follows:

§ 430.23 Test procedures for the measurement of energy and water consumption.

* * * * *

(m) * * *

(4) The average off mode power consumption for central air conditioners and central air conditioning heat pumps shall be determined according to appendix M of this subpart. Round the average off mode power consumption to the nearest watt.

* * * * *

(n) * * *

(2) The annual fuel utilization efficiency for furnaces, expressed in

percent, is the ratio of the annual fuel output of useful energy delivered to the heated space to the annual fuel energy input to the furnace determined according to section 10.1 of appendix N of this subpart for gas and oil furnaces and determined in accordance with section 11.1 of the American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 103–1993 (incorporated by reference, see § 430.3) for electric furnaces. Round the annual fuel utilization efficiency to the nearest whole percentage point.

* * * * *

(5) The average standby mode and off mode electrical power consumption for furnaces shall be determined according to section 8.6 of appendix N of this subpart. Round the average standby mode and off mode electrical power consumption to the nearest watt.

* * * * *

3. Appendix M to subpart B of part 430 is amended by adding a note after the heading that reads as follows:

Appendix M to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps

Note: The procedures and calculations that refer to off mode energy consumption (*i.e.,* sections 3.13 and 4.2.8 of this appendix M) need not be performed to determine compliance with energy conservation standards for central air conditioners and heat pumps at this time. However, any representation related to standby mode and off mode energy consumption of these products made after corresponding revisions to the central air conditioners and heat pumps test procedure must be based upon results generated under this test procedure, consistent with the requirements of 42 U.S.C. 6293(c)(2). For residential central air conditioners and heat pumps manufactured on or after January 1, 2015, compliance with the applicable provisions of this test procedure is required in order to determine compliance with energy conservation standards.

* * * * *

4. Appendix N to subpart B of part 430 is amended by:

a. Removing all references to ''P_{OFF}'' and adding in their place ''$P_{W,OFF}$'' in sections 8.6.2, 9.0, and 10.9;

b. Removing all references to ''P_{SB}'' and adding in their place ''$P_{W,SB}$'' in sections 8.6.1, 8.6.2, 9.0, and 10.9; and

c. Revising the note after the heading.

The revision reads as follows:

Appendix N to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers

Note: The procedures and calculations that refer to off mode energy consumption (*i.e.,* sections 8.6 and 10.9 of this appendix N) need not be performed to determine compliance with energy conservation standards for furnaces and boilers at this time. However, any representation related to standby mode and off mode energy consumption of these products made after April 18, 2011 must be based upon results generated under this test procedure, consistent with the requirements of 42 U.S.C. 6293(c)(2). For furnaces manufactured on or after May 1, 2013, compliance with the applicable provisions of this test procedure is required in order to determine compliance with energy conservation standards. For boilers, the statute requires that after July 1, 2010, any adopted energy conservation standard shall address standby mode and off mode energy consumption for these products, and upon the compliance date for such standards, compliance with the applicable provisions of this test procedure will be required.

* * * * *

5. Section 430.32 is amended by:

a. Revising paragraph (c)(2);

c. Adding paragraphs (c)(3), (c)(4), (c)(5), (c)(6);

d. Revising paragraphs (e)(1)(i) and (e)(1)(ii); and

d. Adding paragraphs (e)(1)(iii), and (e)(1)(iv).

The additions and revisions read as follows:

§ 430.32 Energy and water conservation standards and their effective dates.

* * * * *

(c) * * *

(2) Central air conditioners and central air conditioning heat pumps manufactured on or after January 23, 2006, and before January 1, 2015, shall have Seasonal Energy Efficiency Ratio and Heating Seasonal Performance Factor no less than:

Product class	Seasonal energy efficiency ratio (SEER)	Heating seasonal performance factor (HSPF)
(i) Split-system air conditioners	13	.....
(ii) Split-system heat pumps	13	7.7
(iii) Single-package air conditioners	13	.....
(iv) Single-package heat pumps	13	7.7
(v)(A) Through-the-wall air conditioners and heat pumps—split system [1]	10.9	7.1
(v)(B) Through-the-wall air conditioners and heat pumps—single package [1]	10.6	7.0
(vi) Small-duct, high-velocity systems	13	7.7
(vii)(A) Space-constrained products—air conditioners	12	.....
(vii)(B) Space-constrained products—heat pumps	12	7.4

[1] The ''through-the-wall air conditioners and heat pump—split system'' and ''through-the-wall air conditioner and heat pump—single package'' product classes only applied to products manufactured prior to January 23, 2010. Products manufactured as of that date must be assigned to one of the remaining product classes listed in this table. The product class assignment depends on the product's characteristics. Product class definitions can be found in 10 CFR 430.2 and 10 CFR part 430, subpart B, appendix M. DOE believes that most, if not all, of the historically characterized ''through-the-wall'' products will be assigned to one of the space-constrained product classes.

(3) Central air conditioners and central air conditioning heat pumps manufactured on or after January 1, 2015, shall have a Seasonal Energy Efficiency Ratio and Heating Seasonal Performance Factor not less than:

Product class [1]	Seasonal energy efficiency ratio (SEER)	Heating seasonal performance factor (HSPF)
(i) Split-system air conditioners	13	.....
(ii) Split-system heat pumps	14	8.2
(iii) Single-package air conditioners	14	.....

Product class [1]	Seasonal energy efficiency ratio (SEER)	Heating seasonal performance factor (HSPF)
(iv) Single-package heat pumps	14	8.0
(v) Small-duct, high-velocity systems	13	7.7
(vi)(A) Space-constrained products—air conditioners	12	.....
(vii)(B) Space-constrained products—heat pumps	12	7.4

[1] The ''through-the-wall air conditioners and heat pump—split system'' and ''through-the-wall air conditioner and heat pump—single package'' product classes only applied to products manufactured prior to January 23, 2010. Products manufactured as of that date must be assigned to one of the remaining product classes listed in this table. The product class assignment depends on the product's characteristics. Product class definitions can be found in 10 CFR 430.2 and 10 CFR part 430, subpart B, appendix M. DOE believes that most, if not all, of the historically characterized ''through-the-wall'' products will be assigned to one of the space-constrained product classes.

(4) In addition to meeting the applicable requirements in paragraph (c)(3) of this section, products in product class (i) of that paragraph (*i.e.,* split-system air conditioners) that are manufactured on or after January 1, 2015, and installed in the States of Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, or Virginia, or in the District of Columbia, shall have a Seasonal Energy Efficiency Ratio not less than 14.

(5) In addition to meeting the applicable requirements in paragraph (c)(3) of this section, products in product classes (i) and (iii) of paragraph (c)(3) (*i.e.,* split-system air conditioners and single-package air conditioners) that are manufactured on or after January 1, 2015, and installed in the States of Arizona, California, Nevada, or New Mexico shall have a Seasonal Energy Efficiency Ratio not less than 14 and have an Energy Efficiency Ratio (at a standard rating of 95 °F dry bulb outdoor temperature) not less than the following:

Product class	Energy efficiency ratio (EER)
(i) Split-system rated cooling capacity less than 45,000 Btu/hr	12.2
(ii) Split-system rated cooling capacity equal to or greater than 45,000 Btu/hr	11.7
(iii) Single-package systems	11.0

(6) Central air conditioners and central air conditioning heat pumps manufactured on or after January 1, 2015, shall have an average off mode electrical power consumption not more than the following:

Product class	Average off mode power consumption $P_{W,OFF}$ (watts)
(i) Split-system air conditioners	30
(ii) Split-system heat pumps	33
(iii) Single-package air conditioners	30
(iv) Single-package heat pumps	33
(v) Small-duct, high-velocity systems	30
(vi) Space-constrained air conditioners	30
(vii) Space-constrained heat pumps	33

* * * * *

(e) * * *

(1) * * *

(i) The Annual Fuel Utilization Efficiency (AFUE) of residential furnaces shall not be less than the following for non-weatherized furnaces manufactured before May 1, 2013, and weatherized furnaces manufactured before January 1, 2015:

Product class	AFUE (percent) [1]
(A) Furnaces (excluding classes noted below)	78
(B) Mobile Home furnaces	75
(C) Small furnaces (other than those designed solely for installation in mobile homes) having an input rate of less than 45,000 Btu/hr	
(1) Weatherized (outdoor)	78
(2) Non-weatherized (indoor)	78

[1] Annual Fuel Utilization Efficiency, as determined in § 430.23(n)(2) of this part.

(ii) The AFUE of residential non-weatherized furnaces manufactured on or after May 1, 2013, and weatherized gas and oil-fired furnaces manufactured on or after January 1, 2015 shall be not less than the following:

Product class	AFUE (percent) [1]
(A) Non-weatherized gas furnaces (not including mobile home furnaces)	80
(B) Mobile Home gas furnaces	80
(C) Non-weatherized oil-fired furnaces (not including mobile home furnaces)	83
(D) Mobile Home oil-fired furnaces	75
(E) Weatherized gas furnaces	81
(F) Weatherized oil-fired furnaces	78
(G) Electric furnaces	78

[1] Annual Fuel Utilization Efficiency, as determined in § 430.23(n)(2) of this part.

(iii) In addition to meeting the applicable requirements in paragraph (e)(1)(ii) of this section, products in product classes (A) and (B) of that paragraph (*i.e.,* residential non-weatherized gas furnaces (including mobile home furnaces)) that are manufactured on or after May 1, 2013, and installed in the States of Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming, shall have an AFUE not less than 90 percent.

(iv) Furnaces manufactured on or after May 1, 2013, shall have an electrical standby mode power consumption ($P_{W,SB}$) and electrical off mode power consumption ($P_{W,OFF}$) not more than the following:

Product class	Maximum standby mode electrical power consumption, $P_{W,SB}$ (watts)	Maximum off mode electrical power consumption, $P_{W,OFF}$ (watts)
(A) Non-weatherized gas furnaces (including mobile home furnaces)	10	10
(B) Non-weatherized oil-fired furnaces (including mobile home furnaces)	11	11
(C) Electric furnaces	10	10

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[FR Doc. 2011–14556 Filed 6–24–11; 8:45 am]

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