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Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers; Final Rule

DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket Number: EE–RM/STD–01–350]

RIN 1904–AA78

Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers

AGENCY: Department of Energy.

ACTION: Final rule.

SUMMARY: The Department of Energy (DOE) has determined that revised energy conservation standards for residential furnaces and boilers will result in significant conservation of energy, are technologically feasible, and are economically justified. On this basis, DOE is today amending the existing energy conservation standards for these products.

DATES: The rule is effective January 18, 2008. The standards established in today's final rule have a compliance date of November 19, 2015.

ADDRESSES: For access to the docket to read background documents, the technical support document (TSD), transcripts of the public meetings in this proceeding, or comments received, visit the U.S. Department of Energy, the Resource Room of the Building Technologies Program at 950 L'Enfant Plaza Drive, SW., Washington, DC. 20024, (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please call Ms. Brenda Edwards at the above telephone number for additional information regarding visiting the Resource Room. Please note: DOE's Freedom of Information Reading Room (formerly Room 1E–190 at the Forrestal Building) no longer houses rulemaking materials. You may also obtain copies of certain previous rulemaking documents from this proceeding (i.e., Framework Document, advance notice of proposed rulemaking (ANOPR), notice of proposed rulemaking (NOPR or proposed rule)), draft analyses, public meeting materials, and related test procedure documents from the Office of Energy Efficiency and Renewable Energy's Web site at *http://www.eere.energy.gov/buildings/appliance_standards/residential/furnaces_boilers.html*.

FOR FURTHER INFORMATION CONTACT: Mohammed Khan, Project Manager, Energy Conservation Standards for Residential Furnaces and Boilers, U.S. Department of Energy, Energy Efficiency and Renewable Energy, Building Technologies Program, EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–7892, e-mail: *Mohammed.Khan@ee.doe.gov;* or Chris Calamita, Esq. or Francine Pinto, Esq., U.S. Department of Energy, Office of the General Counsel, GC–72, 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9507, e-mail: *Christopher.Calamita@hq.doe.gov* or *Francine.Pinto@hq.doe.gov.*

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I. Summary of the Final Rule and Its Benefits

A. The Standard Levels

The Energy Policy and Conservation Act, as amended (42 U.S.C. 6291 et seq.; EPCA), directs the Department of Energy (DOE) to consider amending the energy conservation standards for residential furnaces and boilers established under EPCA. (42 U.S.C. 6295(f)(3)(B)) Any amended standard must be designed to ''achieve the maximum improvement in energy efficiency * * * which the Secretary determines is technologically feasible and economically justified.'' (42 U.S.C. 6295(o)(2)(A)) Moreover, EPCA states that the Secretary may not establish an amended standard if such standard would not result in

''significant conservation of energy,'' or ''is not technologically feasible or economically justified.'' (42 U.S.C. 6295(o)(3)(B)) The standards in today's final rule, which apply to non-weatherized and weatherized gas furnaces, mobile home gas furnaces, oil-fired furnaces, and gas- and oil-fired boilers,[1] satisfy these requirements.

Table I.1 shows the standard levels DOE is promulgating today. These standards will apply to products manufactured for sale in the United States, or imported to the United States, on or after November 19, 2015.

TABLE I.1.—STANDARD LEVELS FOR FURNACES AND BOILERS

Product class	AFUE* (%)
Non-weatherized gas furnaces	80
Weatherized gas furnaces	81
Mobile home gas furnaces	80
Oil-fired furnaces	82
Gas boilers	82
Oil-fired boilers	83

*AFUE = annual fuel utilization efficiency.

B. Current Federal Standards for Residential Furnaces and Boilers

Table I.2 presents the current Federal minimum energy conservation standards for residential furnaces and boilers.

TABLE I.2.—CURRENT FEDERAL STANDARDS FOR RESIDENTIAL FURNACES AND BOILERS

Product class	AFUE (%)
Non-weatherized gas furnaces	78
Weatherized gas furnaces	78
Mobile home gas furnaces	75
Oil-fired furnaces	78
Gas boilers	80
Oil-fired boilers	80

C. Consumer Benefits

Table I.3 summarizes the implications of today's standards for consumers of residential furnaces and boilers.

TABLE I.3.—IMPLICATIONS OF NEW STANDARDS FOR CONSUMERS*

Product class	AFUE (%)	Installed cost	Installed cost increase	Life-cycle cost savings	Payback period (years)
Non-weatherized gas furnaces	80	$2,044	$8	$2	1.7
Weatherized gas furnaces	81	3,907	19	62	3.4
Mobile home gas furnaces	80	940	96	111	3.7
Oil-fired furnaces	82	3,142	17	177	0.7
Gas boilers	82	3,826	199	208	12
Oil-fired boilers	83	3,920	28	69	0.9

* Average values.

The economic impacts on consumers (i.e., the average life-cycle cost (LCC) savings) are positive. For example, a non-weatherized gas furnace meeting the standard is projected to have a very small increase in average total installed cost, and the annual energy savings result in an average LCC savings of $2 and a payback period of 1.7 years. No households purchasing non-weatherized gas furnaces, including southern households, would experience a net LCC increase. A gas boiler meeting the standard is projected to have an increase in average total installed cost of $199, but the annual energy savings result in an average LCC savings of $208 and a payback period of 12 years.

D. Impact on Manufacturers

Using a real corporate discount rate of 7.4 percent for furnaces and 6.2 percent for boilers, DOE estimates the industry net present value (INPV) of the residential furnace industry to be $1,528 million and the INPV of the residential boiler industry to be $279 million, in 2006$. DOE estimates the impact of today's standards on the INPV of the residential furnace and boiler industry to be between a 4.0 percent loss and a 2.7 percent loss (-$74 million to -$48 million). Based on DOE's interviews with the major manufacturers of residential furnaces and boilers, DOE estimates minimal plant closings or loss of employment as a result of the standards promulgated today.

E. National Benefits

DOE estimates the standards will save approximately 0.25 quads (quadrillion (10^{15}) British thermal units (Btu)) of energy over 24 years (2015–2038). For comparison, approximately four quads are used annually for space heating in U.S. homes.

These energy savings are projected to result in cumulative greenhouse gas emission reductions of approximately 7.8 million tons (Mt) of carbon dioxide (CO_2). Additionally, the standards will help alleviate air pollution by resulting in approximately 9.2 thousand tons (kt) of nitrogen oxides (NO_X) emission reductions from 2015 through 2038, or a similar amount of NO_X emissions allowance credits in areas where such emissions are subject to emissions caps, and approximately 1.8 kt of household emission reductions of sulfur dioxide (SO_2). DOE expects the standards to have negligible impact on electricity generating capacity.

The national net present value (NPV) of the standards is $0.69 billion using a seven-percent discount rate and $2.18 billion using a three-percent discount rate, cumulative from 2015 to 2038 in 2006$. This is the estimated total value of future savings minus the estimated increased costs for purchasing complying products, discounted to the year 2007.

The benefits and costs of today's final rule can also be expressed in terms of annualized 2006$ values over the forecast period 2015 through 2038. Using a seven percent discount rate for the annualized cost analysis, the cost of the standards established in today's final rule is $41 million per year in increased equipment and installation costs while the annualized benefits are $144 million per year in reduced equipment operating costs. Using a three percent discount rate, the cost of the standards established n today's final rule is $40 million per year while the benefits of today's standards are $204 million per year.

[1] These types of products are referred to collectively hereafter as ''residential furnaces and boilers'' or ''furnaces and boilers.''

F. Conclusion

DOE concludes that the benefits (energy savings, consumer LCC savings, national NPV increases, and emissions reductions) to the Nation of the standards outweigh their costs (loss of manufacturer INPV and consumer LCC increases for a relatively small number of furnace and boiler users). DOE also concludes that today's standards for furnaces and boilers represent that maximum improvement in energy efficiency that is technologically feasible and economically justified, and will result in significant energy savings. At present, products that meet the new standard levels are commercially available.

II. Introduction

A. Authority

Title III of EPCA sets forth a variety of provisions designed to improve energy efficiency; specifically, Part B of title III establishes the Energy Conservation Program for Consumer Products other than Automobiles. (42 U.S.C. 6291–6309) The program covers consumer products (referred to hereafter as ''covered products''), including residential furnaces and boilers. (42 U.S.C. 6292(a)(5))

Under EPCA, the energy conservation program consists essentially of the following: Testing, labeling, and Federal energy conservation standards. The Federal Trade Commission (FTC) has primary responsibility for labeling, and DOE implements the remainder of the program. (42 U.S.C. 3294) Section 323 of EPCA authorizes DOE, with assistance from the National Institute of Standards and Technology (NIST) and subject to certain criteria and conditions, to develop test procedures to measure the energy efficiency, energy use, or estimated annual operating cost of each covered product. (42 U.S.C. 6293) The applicable furnace and boiler test procedures appear at Title 10 of the Code of Federal Regulations (CFR) part 430, subpart B, Appendix N.

EPCA provides criteria for prescribing new or amended standards for covered products. Any new or amended standard for a covered product must be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A))

Additionally, EPCA provides specific prohibitions on prescribing new and amended standards. Generally, DOE may not prescribe an amended or new standard for products if no test procedure has been established for the product.[2] (42 U.S.C. 6295(o)(3)(A). Further, DOE may not prescribe an amended or new standard if DOE determines by rule that such standard would not result in ''significant conservation of energy,'' or ''is not technologically feasible or economically justified.'' (42 U.S.C. 6295(o)(3)(B))

EPCA also provides that, in deciding whether a standard is economically justified, DOE must, after receiving comments on a proposed standard, determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

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

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

(3) The total projected amount of energy savings likely to result directly from the imposition of the standard;

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

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

(6) The need for national energy conservation; and

(7) Other factors the Secretary considers relevant. (42 U.S.C. 6295(o)(2)(B)(i))

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

[2] This prohibition does not apply to standards for dishwashers, clothes washers, clothes dryers, and kitchen ranges and ovens. (42 U.S.C. 3295(o)(3)(A))

Section 325(q) of EPCA is applicable to promulgating a standard for a type or class of covered product that has two or more subcategories. (42 U.S.C. 6295(q)) DOE must specify a different standard level than that which applies generally to such type or class of products ''for any group of covered products which have the same function or intended use, if * * * products within such group—(A) consume a different kind of energy from that consumed by other covered products within such type (or class); or (B) have a capacity or other performance-related feature which other products within such type (or class) do not have and such feature justifies a higher or lower standard'' than applies or will apply to the other products. (42 U.S.C. 6295(q)(l)(A) and (B)) In determining whether a performance-related feature justifies such a different standard for a group of products, DOE must consider ''such factors as the utility to the consumer of such a feature'' and other factors DOE deems appropriate. (42 U.S.C. 6295(q)(1)) Any rule prescribing such a standard must include an explanation of the basis on which DOE established such higher or lower level. (42 U.S.C. 6295(q)(2)) In 1993, DOE relied on this authority to establish four product classes of residential furnaces and two product classes of residential boilers, which are the subject of this rulemaking. 58 FR 47326 (September 8, 1993).

Federal energy conservation requirements generally preempt State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297) DOE is authorized, however, to grant waivers from preemption for particular State laws or regulations, in accordance with the procedures and provisions set forth in section 327(d) of EPCA. (42 U.S.C. 6297(d)) Specifically, States with a regulation that provides for an energy conservation standard for any type of covered product for which there is a Federal energy conservation standard may petition the Secretary for a DOE rule that permits the State regulation to become effective with respect to such covered product. In order for a petition to be granted, a State must establish by a preponderance of the evidence that its regulation is needed to meet ''unusual and compelling State or local energy * * * interests.'' (42 U.S.C. 6297(d)(1)(B))

B. Background

1. Current Standards

EPCA established an energy conservation standard for residential furnaces and boilers. It set the standard

in terms of the annual fuel utilization efficiency (AFUE) descriptor at a minimum value of 78 percent for most furnaces. (42 U.S.C. 6295(f)(1)) It set the minimum AFUE at 75 percent for gas steam boilers and 80 percent for other boilers. (42 U.S.C. 6295(f)(1)(A)) For mobile home furnaces, EPCA set the minimum AFUE at 75 percent. (42 U.S.C. 6295(f)(2)) These standards became effective on January 1, 1992, with the exception of the standard for mobile home furnaces, for which the effective date was September 1, 1990. (42 U.S.C. 6295(f)(1) and (2))

2. History of Standards Rulemaking for Residential Furnaces and Boilers

As discussed in the October 2006 notice of proposed rulemaking (NOPR), this rulemaking began with the publication of an advance notice of proposed rulemaking (ANOPR) on September 28, 1990. 55 FR 39624. A second ANOPR was published on July 29, 2004. 69 FR 45420. On October 6, 2006, DOE published a NOPR in the **Federal Register** proposing amended energy efficiency standards for residential furnace and boilers. 71 FR 59203. In conjunction with the October 2006 NOPR, DOE also published on its Web site the complete technical support document (TSD) for the proposed rule, which incorporated the final analyses DOE conducted and technical documentation of each analysis. The NOPR TSD included the engineering analysis spreadsheet, the LCC spreadsheets, the national and regional impact analysis spreadsheets, and the manufacturer impact analysis (MIA) spreadsheet—all of which are available at *http://www.eere.energy.gov/buildings/appliance_standards/residential/fb_nopr_analysis.html*. The energy efficiency standards proposed for furnaces and boilers were as shown in Table II.1.

TABLE II.1.—OCTOBER 2006 PROPOSED ENERGY EFFICIENCY STANDARDS FOR FURNACES AND BOILERS

Product class	AFUE* (%)
Non-weatherized gas furnaces	80
Weatherized gas furnaces	83
Mobile home gas furnaces	80
Oil-fired furnaces	82
Gas boilers	84
Oil-fired boilers	83

* AFUE = annual fuel utilization efficiency.

The October 2006 NOPR also included additional background information on the history of this rulemaking and on DOE's use in this rulemaking of the procedures, interpretations, and policies set forth in the Process Rule. 71 FR 59207–59208. DOE held a public meeting in Washington, DC, on October 30, 2006, to hear oral comments relevant to the October 2006 proposed rule.

After the publication of the October 2006 proposed rule, DOE met with GAMA, Carrier, and Rheem on December 14, 2006, to receive comments regarding cost and safety issues concerning weatherized gas furnaces that are manufactured to operate at 83-percent AFUE. (GAMA, No. 146 at p. 1)[3] These comments are further described in section IV.A. In addition, DOE issued a notice of data availability and reopening of comment period on February 9, 2007, to respond to questions raised at the public meeting concerning DOE's assumptions regarding shipments in the base case and the installation cost for oil-fired furnaces. 72 FR 6184.

III. General Discussion

A. Test Procedures

Section 7(c) of the Process Rule indicates that, if modifications are needed to its test procedures for a covered product, DOE will issue a final, modified test procedure before issuing a proposed rule for energy conservation standards for that product. DOE has determined that modifications are not needed to its existing test procedure for furnaces and boilers, and accordingly has not adopted a revised test procedure for these products. Comments received about test procedures are discussed in section V.B.9.

B. Technological Feasibility

1. General

As stated above, standards that DOE establishes for furnaces and boilers must be technologically feasible. (42 U.S.C. 6295(o)(2)(A) and (o)(3)(B)) DOE considers a design option to be technologically feasible if it is in use by the respective industry or if research has progressed to the development of a working prototype. The Process Rule sets forth a definition of technological feasibility as follows: ''Technologies incorporated in commercial products or in working prototypes will be considered technologically feasible.'' 10 CFR part 430, subpart C, Appendix A, section 4(a)(4)(i).

This final rule considers the same design options as those evaluated in the October 2006 proposed rule. (See the final rule TSD accompanying this notice, Chapter 4.) The evaluated technologies all have been used (or are being used) in commercially available products or working prototypes. The designs all incorporate materials and components that are commercially available in today's furnace and boiler supply market. DOE has determined that all of the efficiency levels evaluated in this notice are technologically feasible.

2. Maximum Technologically Feasible Levels

In developing the October 2006 proposed rule, consistent with section 325(p)(2) of EPCA, DOE identified the maximum technologically feasible levels. (See NOPR TSD Chapter 6.) DOE did not receive any comments on the October 2006 proposed rule to lead DOE to consider changes to the maximum technologically feasible (max tech) levels. Therefore, for today's final rule, the max tech levels for all classes are the same max tech levels identified in the October 2006 proposed rule and are provided in Table II.2 below. 71 FR 59211.

TABLE II.2.—MAX TECH LEVELS CONSIDERED IN FURNACE AND BOILER RULEMAKING

Product class	AFUE* (%)
Non-weatherized gas furnaces	96
Weatherized gas furnaces	83
Mobile home gas furnaces	90
Oil-fired furnaces	85
Gas boilers	99
Oil-fired boilers	95

* AFUE = annual fuel utilization efficiency.

C. Energy Savings

As stated above, EPCA directs DOE to establish amended standards at a level of maximum improvement in energy efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A)) DOE is prohibited from adopting a standard for a product if that standard would not result in ''significant'' energy savings, or is not technologically feasible or economically justified. (42 U.S.C. 6295(o)(3)(B)) While EPCA does not define the term ''significant,'' the U.S. Court of Appeals, in *Natural Resources Defense Council* v. *Herrington*, indicated that Congress intended ''significant'' energy savings in this context to be savings that were not

[3] A notation in the form ''GAMA, No. 146 at p. 1'' identifies a written comment DOE has received and has included in the docket of this rulemaking. This particular notation refers to a comment (1) By the Gas Appliance Manufacturers Association (GAMA), (2) under document number 146 in the docket of this rulemaking (maintained in the Resource Room of Building Technologies Program), and (3) appearing on page 1 of document number 146.

''genuinely trivial.'' 768 F.2d 1355, 1373 (D.C. Cir. 1985). The energy savings for energy conservation standards at each of the trial standard levels (TSLs) considered in this rulemaking are nontrivial, and therefore, DOE has determined them to be ''significant'' within the meaning of section 325 of EPCA.

DOE forecasted energy savings attributable to the TSLs using the national energy savings (NES) spreadsheet tool, as discussed in the October 2006 proposed rule. 71 FR 59211–59212, 59224–59227, and 59245–59246. For the purpose of today's final rule, DOE has relied on the NES analysis as presented in the October 2006 proposed rule. EPCA further requires consideration of energy savings in the context of the economic justification.

D. Economic Justification

1. Specific Criteria

As noted earlier, EPCA provides seven factors for DOE to evaluate in determining whether an energy conservation standard for residential furnaces and boilers is economically justified. (42 U.S.C. 6295(o)(2)(B)(i)) The following discusses how DOE has addressed each of those seven factors in this rulemaking. Changes to considerations of those criteria between the proposed rule and the final rule are also discussed below. The inputs relied upon in consideration of each criterion and changes to those inputs are discussed in section V, below.

a. Economic Impact on Consumers and Manufacturers

DOE considered the economic impact of the standard on consumers and manufacturers, as discussed in the October 2006 proposed rule. 71 FR 59212, 59219–59223, 59228–59233, 59234–59245. For this final rule, DOE updated the analyses to incorporate more recent material price information.

b. Life-Cycle Costs

DOE considered life-cycle costs of furnaces and boilers, as discussed in the October 2006 proposed rule. 71 FR 59212–59213, 59219–59224, 59234–59239. It calculated the sum of the purchase price and the operating expense—discounted over the lifetime of the products—to estimate the range in expected LCC benefits to consumers due to the standards.

c. Energy Savings

While significant conservation of energy is a separate statutory requirement for imposing an energy conservation standard, EPCA also requires DOE, in determining the economic justification of a proposed standard, to consider the total projected energy savings that are expected to result directly from the standard. (42 U.S.C. 6295(o)(2)(B)(i)(III)) As in the October 2006 Proposed Rule, DOE used the NES spreadsheet results in its consideration of total projected savings that are directly attributable to the considered standard levels. 71 FR 59211–59212, 59224–59227, 59245–59246.

d. Lessening of Utility or Performance of Products

As reflected in the October 2006 proposed rule, DOE considered whether any lessening of the utility or performance of furnaces and boilers would be likely to result from today's standards. 71 FR 59213.

e. Impact of Any Lessening of Competition

DOE considers any lessening of competition that is likely to result from standards. Accordingly, as discussed in the October 2006 proposed rule, 71 FR 59213, 59247, DOE requested that the Attorney General transmit to the Secretary a written determination of the impact, if any, of any lessening of competition likely to result from the standard, together with an analysis of the nature and extent of such impact. (42 U.S.C. 6295(o)(2)(B)(i)(V) and (B)(ii))

To assist the Attorney General in making such a determination, DOE provided the Department of Justice (DOJ) with copies of the October 2006 proposed rule and the NOPR TSD for review. The Attorney General's response is discussed in section VI.C.5 below, and is reprinted at the end of this final rule.

f. Need of the Nation To Conserve Energy

In considering standards for furnaces and boilers, the Secretary must consider the need of the Nation to conserve energy. (42 U.S.C. 6295(o)(2)(B)(i)(VI)) The Secretary recognizes that energy conservation benefits the Nation in several important ways, including slowing the depletion of domestic natural gas resources, improving the security of the Nation's energy system, and reducing greenhouse gas emissions. The potential benefits from additional natural gas conservation are further discussed in section V.B.4 below.

g. Other Factors

The Secretary, in determining whether a standard is economically justified, may consider any other factors that the Secretary deems to be relevant. (42 U.S.C. 6295(o)(2)(B)(i)(VII)) In considering amended standards in the October 2006 proposed rule and in adopting today's standards, the Secretary considered the potential for furnace and boiler standards to pose public health risks due to carbon monoxide release into the home as a result of venting system or heat exchanger failure. As discussed in section VI of this preamble, potential safety concerns were weighed against adopting certain standard levels.

2. Rebuttable Presumption

Section 325(o)(2)(B)(iii) of EPCA states that there is a rebuttable presumption that an energy conservation standard is economically justified if the increased installed cost for a product that meets the standard is less than three times the value of the first-year energy savings resulting from the standard, as calculated under the applicable DOE test procedure. (42 U.S.C. 6295(o)(2)(B)(iii)) Under the standard levels adopted in this document for non-weatherized and weatherized gas furnaces, mobile home gas furnaces, and hot-water oil-fired boilers, DOE determined that this presumption applies. Regardless of the rebuttable presumption, DOE also determined that all of the standard levels adopted in today's final rule are economically justified based on the above-described analyses.

IV. Methodology and Revisions to the Analyses Employed in the Proposed Rule

DOE used a number of analytical tools that it previously developed and adapted for use in this rulemaking. One of the tools is a spreadsheet that calculates LCC and payback period (PBP). Another tool calculates NES and national NPV. DOE also used the Government Regulatory Impact Model (GRIM), along with other methods, in its MIA. Finally, DOE developed an approach using the National Energy Modeling System (NEMS) to estimate impacts of residential furnace and boiler energy efficiency standards on utilities and the environment. Each of the analytical tools is discussed in detail in the October 2006 NOPR. 71 FR 59213–59234.

As a basis for this final rule, DOE has continued to use the spreadsheets and approaches explained in the October 2006 NOPR. DOE used the same general methodology as applied in the October 2006 NOPR but revised some of the assumptions and inputs for the final rule in response to stakeholder comments. These updates are discussed in the sections below.

A. Engineering Analysis

The purpose of the engineering analysis was to characterize the relationship between the efficiency and the cost of residential furnaces and boilers. As discussed in the NOPR, DOE used the design-option approach, the efficiency-level approach, and the cost-assessment approach to the engineering analysis. 71 FR 59214–59219. As part of the analysis, DOE developed data—including manufacturing costs, markups, installation costs, and maintenance costs—that it used to establish the manufacturing selling price of more-efficient equipment. Chapter 6 of the TSD contains detailed discussion of the engineering analysis methodology.

In response to the publication of the October 2006 proposed rule, DOE received a number of comments on the engineering analysis methodology. These comments referred to the assumptions concerning the heat exchanger materials, costs for weatherized gas furnaces, the installation costs for gas-fired boilers, and other topics. In response to these comments, DOE made several changes to the data applied in its approach. Table IV.1 summarizes the data DOE used to derive the inputs to the engineering analysis for the NOPR and for today's final rule.

TABLE IV.1.—APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE ENGINEERING ANALYSIS

Input	NOPR analysis	Final rule analysis
Equipment Cost	For the most widely used efficiency levels, DOE used a cost model of manufacturing costs created by tear-down analysis. For the remaining levels, DOE used design-option analysis. Incorporated industry feedback from GAMA and individual manufacturers to generate manufacturing-cost-versus-efficiency curves. Updated manufacturing-cost-versus-efficiency curves.	Same method, using average materials prices for the period 2002 to 2006. For weatherized gas furnaces, assumed stainless steel heat exchangers for 82-percent and 83-percent AFUE products. For gas boilers, assumed those fractions of boilers requiring Category III venting at various AFUE levels will also incorporate a draft inducer into the product design.
Markups	Derived markups from an analysis of corporate financial data. Multiplied manufacturing costs by manufacturer, distributor, contractor, and builder markups, and sales tax, as appropriate, to get equipment price.	No change.
Installation Cost	Used a distribution of weighted-average installation costs from the Installation Model. Installation configurations are weight-averaged by frequency of occurrence in the field, and vary by installation size. The Installation Model is based on a commonly used cost-estimation method and is comparable to available, known data. New assumption that all 81-percent AFUE gas furnaces use double-wall vents.	No change.
Maintenance Costs	Used Gas Research Institute data for gas furnaces and boilers, water heater rulemaking survey results for oil-fired equipment, and data from the 1993 rulemaking for mobile home furnaces. Accounted for higher maintenance frequency for modulating design option, and used same costs for condensing and non-condensing equipment.	Same sources for maintenance costs. Included repair costs for gas-fired equipment as a function of the equipment price.
Annual Energy Use *	Calculated energy use using the DOE test procedure	No change.
Energy Prices *	*Annual Energy Outlook (AEO)2005* forecast prices for effective date of 2015.	*AEO2007* forecast prices for effective date of 2015.

* Inputs required to calculate rebuttable-presumption payback period. For more details on the rebuttable-presumption payback period, refer to sections III.D.2 and VI.C.1.a.

GAMA, Lennox, Carrier, and Trane submitted comments urging DOE to revise the costs assumed in the engineering analysis for manufacturing high-efficiency weatherized gas furnaces. Specifically, GAMA commented that DOE underestimated the cost of attaining 83-percent AFUE. GAMA stated that a significant amount of condensation can build up upon start-up of a weatherized gas furnace having an 83-percent AFUE and that the unit must run for a considerable amount of time before the heat exchanger completely dries out. As a result, GAMA commented that manufacturers would need to design their weatherized gas furnaces at 83-percent AFUE to handle condensate. (GAMA, No. 116 at pp. 5–8) [4] Lennox pointed out that it is physically possible to design a furnace that will deliver 83-percent AFUE in a laboratory test, but that the variability of outdoor conditions will pose condensation problems at efficiency levels above 80-percent AFUE. At 83-percent AFUE, which translates to a steady-state efficiency of 85.5 percent or higher, Lennox stated that it may also be necessary to provide a condensate disposal system for the furnace. (Public Meeting Transcript, No. 107.6 at p. 107)

Carrier commented that weatherized gas furnaces are installed outdoors, and moisture in the flue gas cannot be allowed to condense, regardless of the corrosion-resistance of the material used. (Carrier, No. 118 at pp. 1–2) Carrier stated its belief that a means to dispose of the condensate in cold outdoor ambient conditions must be developed to provide for drainage or freeze protection. It further stated that, when cold outside air and safety factors are taken into account, the maximum design efficiency to avoid significant potential for continuous condensation on a complete model family is 80-percent AFUE. (Carrier, No. 118 at pp. 1–2)

Trane commented that 83-percent AFUE for weatherized gas furnaces would result in a steady-state efficiency of 85–86 percent, which would necessitate different, more costly materials than the materials DOE assumed in the October 2006 proposed rule. (Public Meeting Transcript, No. 107.6 at p. 107)

GAMA and Lennox specifically commented on DOE's incremental

manufacturing cost increase of $30 for an 83-percent AFUE weatherized gas furnace over the baseline. GAMA pointed out that DOE's NOPR analysis used increased heat exchanger area as the only design option needed to achieve 83-percent AFUE. GAMA stated that, based on manufacturer experience, the proposed 83-percent AFUE standard for weatherized gas furnaces would require the use of stainless steel for internal components such as the heat exchanger, collector box, and internal flue, due to the expected internal condensation. GAMA also commented that AL 29–4C is the most probable type of stainless steel that manufacturers would use, which would significantly increase the cost of the product. GAMA also stated its opinion that weatherized gas furnaces at 83-percent AFUE would also require a condensate disposal system that could function in below-freezing temperatures. GAMA surveyed its members and provided estimates of the incremental manufacturing costs to reach 83-percent AFUE over the baseline, which range from $78 to $320. (GAMA, No. 116 at pp. 5–8)

Lennox also disagreed with DOE's analysis, which indicated that an 83-percent AFUE weatherized gas furnace with characteristics satisfactory for the expected use can be manufactured and sold to the consumer for an additional $30. Lennox stated that GAMA's average incremental manufacturing cost estimate of $223 over the baseline for an 83-percent AFUE weatherized gas furnace, for the addition of stainless steel heat exchangers and condensate removal components, results in an increase in consumer cost of approximately $500. (Lennox, No. 130 at pp. 2–3)

DOE reviewed all the statements from GAMA, Lennox, Carrier, and Trane and revised its engineering analysis accordingly. Specifically, DOE revised its cost assumptions for the heat exchangers in 82-percent- and 83-percent-AFUE weatherized gas furnaces. In the October 2006 proposed rule, DOE assumed that these heat exchangers were made of aluminized steel—the same material used for the higher volume non-weatherized gas furnaces, which would allow manufacturers to take advantage of high-volume material pricing. Thus, the incremental costs of increasing from the baseline to an 83-percent AFUE were only $30. (See NOPR TSD Chapter 6.) In light of the comments, DOE revised the cost model to include heat exchangers made of AL 29–4C at these two AFUE levels and included the cost of a condensate disposal system that could function at below-freezing temperatures. DOE specifically reviewed the costs that GAMA submitted and, based on information obtained during manufacturing interviews and internal engineering expertise, DOE believes GAMA's estimates are within the range of possible manufacturing costs for these systems (see Chapter 6 of the final rule TSD). Therefore, DOE conducted analysis at both the low and high points of the cost range (*i.e.*, $78 and $320, respectively). DOE examined both the low and high scenarios using the LCC spreadsheet and presented the results in Chapter 8 of the final rule TSD.

Ultimately, DOE used the low-cost scenario as the basis for the analysis because DOE's estimates corresponded more closely to the low-range cost that GAMA provided (i.e., $78). However, DOE recognizes that some installations may incur a higher cost. DOE believes inclusion of stainless steel heat exchanger and condensate removal component costs takes into account manufacturer longevity and safety concerns associated with near-condensing weatherized gas furnaces.

DOE did not include the cost of stainless steel heat exchangers for weatherized gas furnaces at 81-percent AFUE. Given the presence of 81-percent AFUE products in the marketplace that do not contain stainless steel heat exchangers, DOE assumed that only units with an AFUE of 82 percent and 83 percent would need stainless steel heat exchangers to prevent corrosion.

Burnham and GAMA commented that DOE neglected to consider the costs associated with adding induced-draft technology to a Category III gas-fired boiler at 84-percent AFUE and above. Burnham further stated that some 84-percent AFUE boilers are natural draft with draft hoods, vent dampers, and electronic ignition, and some are induced draft with either Category I or Category III venting, depending on the manufacturer's requirements in a given installation. In its comments on the October 2006 proposed rule, Burnham pointed out that DOE estimated that 24 percent of installations at 84-percent AFUE would be Category III, and this percentage represents a partial transformation of the baseline boiler market. However, although DOE included the costs associated with Category III special gas vents, Burnham noted that all Category III installations are induced-draft boilers, and that DOE neglected the costs associated with adding induced-draft technology to the boiler. (Public Meeting Transcript, No. 107.6 at p. 42; Burnham, No. 99 at p. 4) Burnham also predicted that, to avoid the venting risks associated with installing natural draft 84-percent AFUE boilers in every installation, all boiler installations at 84-percent AFUE will become induced-draft, and most or all of those will require Category III venting. Burnham urged DOE to apply the costs associated with adding induced-draft technology to all Category III installations. (Public Meeting Transcript, No. 107.6 at p. 42; Burnham, No. 99 at p. 4)

GAMA commented that additional concerns regarding venting safety would require manufacturers to reconsider the application and installation guidelines if the minimum standards for gas-fired boilers were set at 84-percent AFUE. GAMA noted that atmospheric units cost less and meet certain customers' requirements, but they can only be installed in a subset of locations due to venting limitations. At 84-percent AFUE, GAMA commented these gas-fired boilers would be operating at near-condensing conditions, which would lead to potential venting corrosion. GAMA stated that it has been told by its members that concern for safety and reliability would force manufacturers to specify AL 29–4C stainless steel chimney liners and vent connectors in all Category I installations. GAMA estimated the cost of this change to 100-percent stainless steel venting to be roughly $700 to $900. GAMA stated that manufacturers desiring an additional margin of safety might eliminate natural draft products from their product lines completely in favor of induced-draft units. (GAMA, No. 116 at p. 11)

GAMA stated that safety concerns would force manufacturers to specify Category II or III stainless steel venting systems in some gas boiler installations. GAMA stated its belief that DOE's projections for venting consequences of 86-percent and 85-percent-AFUE gas-fired boilers would actually occur at 84-percent and 83-percent AFUE. GAMA further commented that 84-percent-AFUE gas-fired boilers would require 100 percent stainless steel venting. GAMA surveyed its boiler manufacturer members regarding the additional cost of incorporating induced-draft technology and provided DOE with the resulting cost estimates, ranging between $108.75 and $145.75. (GAMA, No. 116 at pp. 10–11)

In response to the comments from Burnham and GAMA, DOE revised the cost model for gas-fired boilers and added the cost of induced-draft technology to the fraction of Category III boilers assumed for each AFUE level. In other words, DOE applied the cost of induced-draft technology to the 24 percent of installations requiring Category III venting at 84-percent AFUE. DOE agrees with stakeholders that

induced-draft technology is likely required for the population of installations using Category III venting. DOE specifically reviewed the costs that GAMA submitted and, based on information obtained during manufacturing interviews and internal engineering expertise, DOE believes GAMA's estimates are within the range of possible manufacturing costs for these systems. Therefore, DOE conducted analyses at both the low and high points of the cost range (i.e., $108.75 and $145.75, respectively). DOE used the low and high scenarios as inputs to the LCC model; the results are presented in Chapter 6 of the final rule TSD.

DOE did not revise its estimates of the fraction of installations requiring Category III venting and induced-draft technology from that relied upon in October 2006 proposed rule. In other words, DOE did not apply the added cost to the entire population of gas-fired boilers at 84-percent AFUE and above, as both Burnham and GAMA suggested. DOE relied on the survey data of actual installations requiring Category III venting that GAMA originally supplied. GAMA and Burnham did not provide any additional survey data to validate their claim that all boilers at 84-percent AFUE and above would require Category III venting and induced-draft technology. DOE acknowledges Burnham's and GAMA's assertions of safety concerns relating to venting systems failure at 84-percent AFUE and above, and considered this issue for a standard level for gas-fired boilers.

B. Life-Cycle Cost and Payback Period Analyses

The purpose of the LCC and PBP analyses was to evaluate the economic impacts of possible new furnace and boiler energy conservation standards on individual consumers. The LCC is the total consumer expense over the life of the furnace or boiler, including purchase and installation expense and operating costs (energy expenditures and maintenance costs). The PBP is the number of years it would take for the consumer to recover the increased costs of a higher-efficiency product through energy savings. As discussed in the NOPR, the LCC and PBP analyses calculated furnace and boiler energy consumption under field conditions for a representative sample of housing units. 71 FR 59219–59220. To compute LCCs, DOE discounted future operating costs to the time of purchase and summed them over the lifetime of the furnace or boiler. DOE measured the change in LCC and the change in PBP associated with a given efficiency level relative to a base case forecast of equipment efficiency. The base case forecast reflects the market in the absence of amended mandatory energy conservation standards.

As part of the LCC and PBP analyses, DOE developed data that it used to establish equipment prices, installation costs, annual household energy consumption, marginal natural gas and electricity prices, maintenance and repair costs, equipment lifetime, and discount rates. Chapter 8 of the TSD contains detailed discussion of the methodology followed for the LCC and PBP analyses.

In response to the publication of the proposed rule, DOE received several comments on the LCC and PBP methodology. In response to these comments, DOE made several changes in its approach. Table IV.2 summarizes the approaches and data DOE used to derive the inputs to the LCC and PBP calculations for the NOPR, and the changes it made for today's final rule. Discussion of the inputs and the changes follows in the sections below.

TABLE IV.2.—SUMMARY OF INPUTS AND KEY ASSUMPTIONS USED IN THE LIFE-CYCLE COST AND PAYBACK PERIOD ANALYSES

Inputs	NOPR analysis	Final rule analysis
Affecting Installed Costs		
Equipment Price	Derived by multiplying manufacturer cost by manufacturer, distributor, contractor, and builder markups and sales tax, as appropriate.	Same method, using average materials prices for the period 2002–2006. For weatherized gas furnaces, assumed stainless steel heat exchanger for 82% and 83% AFUE. For gas boilers, assumed that furnaces that require Category III venting incorporate a draft inducer.
Installation Cost	Used a distribution of weighted-average installation costs from the Installation Model. Weight-averaged installation configuration by frequency of occurrence in the field.	No change.
Affecting Operating Costs		
Maintenance and Repair Costs.	Used Gas Research Institute data for gas furnaces and boilers, water heater rulemaking survey results for oil-fired equipment, and data from the 1993 rulemaking for mobile home furnaces. Supplemented with information that indicates higher maintenance frequency for modulating equipment, and identical maintenance costs for condensing and non-condensing equipment. Did not include repair costs.	Same sources for maintenance costs. Included repair costs for gas-fired equipment.
Annual Heating Load	Calculated heating loads using 2001 Residential Energy Consumption Survey (RECS) data (cooling loads not considered). Incorporated adjustment to account for change in new home size and shell performance between 2001 and 2015.	No change.
Annual Energy Use	Used 26 virtual models that captured the range of common furnace sizes. Energy calculations used annual heating load for each housing unit based on RECS 2001.	No change.

TABLE IV.2.—SUMMARY OF INPUTS AND KEY ASSUMPTIONS USED IN THE LIFE-CYCLE COST AND PAYBACK PERIOD ANALYSES—Continued

Inputs	NOPR analysis	Final rule analysis
Energy Prices	Calculated 2001 average and marginal energy prices for each sample house. Used *AEO2005* forecasts to estimate future average and marginal energy prices.	Same method, using *AEO2007* forecasts to estimate future average and marginal energy prices.
Affecting Present Value of Annual Operating Cost Savings		
Lifetime	Used 2001.58(9) Appliance Magazine survey results, except for boilers, for which DOE developed new estimates based on a literature review.	No change.
Discount Rate	Applied data from 1998 and 2001 Survey of Consumer Finances and other sources to estimate a discount rate for each house.	Same sources, using additional data from 1989, 1992, 1995, and 2004 Survey of Consumer Finances. (See TSD, Chapter 8).

The changes in the approach for estimating the equipment prices are discussed in Chapter 6 of the TSD.

In the October 2006 proposed rule analysis, DOE assumed that maintenance costs would not vary with the AFUE level of furnaces and boilers. Several stakeholders commented that DOE should apply a higher maintenance cost for condensing gas furnaces than for non-condensing equipment. (Carrier, No. 100 at p. 3; Public Meeting Transcript, No. 107.6 at p. 57; GAMA, No. 116 at p. 5; Rheem, No. 138 at p. 3)

In its analysis for today's final rule, DOE included repair costs for gas furnaces and boilers. The repair cost is the cost to the consumer for replacing or repairing components that have failed in the space-conditioning equipment, while the maintenance cost is a regular expense. Since representative data on repair costs were not available, DOE used the same approach as in the 2001 Central Air Conditioner standards rulemaking (67 FR 36383) and assumed that annualized repair costs are equal to one-half the equipment price divided by the average lifetime. Since the equipment cost is higher for equipment that contains more sophisticated mechanical or electronic components, such as condensing furnaces, DOE applied a higher repair cost for these products. Since all gas equipment components are fully covered by a manufacturer warranty for five years, DOE assumed that consumers would not incur any repair costs in the first five years. As a conservative assumption, DOE applied the annualized cost beginning in the sixth year and ending in the last year of service for the equipment.

For oil-fired furnaces and boilers, DOE included an annual maintenance contract, which typically includes repair of failed components. Therefore, DOE did not include a separate repair cost for these products.

DOE defines the equipment lifetime as the age at which a furnace or boiler is retired from service. The American Council for an Energy-Efficient Economy (ACEEE) commented that DOE's equipment lifetime estimate for oil-fired furnaces should be 18 years rather than 15 years, which DOE assumed in the NOPR analysis. (ACEEE, No. 120 at p. 10) DOE based the assumed lifetime of 15 years from *Appliance Magazine,* which reports data provided by furnace manufacturers. ACEEE did not provide data to substantiate the 18-year lifetime. Thus, DOE did not change its assumption about equipment lifetime for oil-fired furnaces.

As it has done in previous rulemakings, DOE derived the discount rates for the LCC analysis from estimates of the finance cost to purchase a furnace or boiler. The Natural Resources Defense Council (NRDC) commented that DOE's decision to use consumer-borrowing rates as a basis for consumer discount rates in the LCC analysis is flawed. (NRDC, No. 63 at p. 12) Consistent with financial theory, the finance cost of raising funds to purchase appliances can be interpreted as: (1) The financial cost of any debt incurred to purchase products, or (2) the opportunity cost of equity used to purchase equipment. DOE used both of these interpretations in estimating discount rates for the LCC analysis for furnaces and boilers. For the NOPR analysis, DOE used data from the Federal Reserve Board's 1998 and 2001 Survey of Consumer Finances (SCF). 71 FR 59233. For the analysis in today's final rule, DOE expanded the data to include the 1989, 1992, 1995, and 2004 SCF. These additional data on consumer finances represent a wide range of economic conditions affecting consumer behavior. Thus, DOE decided to continue to use consumer-borrowing rates as a suitable basis for consumer discount rates in the LCC analysis.

C. National Impact Analysis

The purpose of the national impact analysis (NIA) was to evaluate the energy and economic impacts of possible new furnace and boiler energy conservation standards at the national level. As discussed in the NOPR, DOE calculated the NES and the NPV of total customer costs and savings expected to result from new standards at specific efficiency levels. 71 FR 59224–59228. Table IV.3 summarizes the approach and data DOE used to derive the inputs to the shipments analysis for the NOPR, and the changes it made in the analysis for final rule. In the analysis for the NOPR, DOE analyzed fuel switching only in the new construction market. For this final rule, DOE also analyzed fuel switching in the replacement market, using the same method as for the new construction market. This change results in a larger drop in shipments of non-weatherized gas furnaces at higher efficiency levels than reported in the NOPR. As part of the MIA, furnace manufacturers provided a shipments scenario (i.e., the manufacturers' shipments scenario) that shows significantly greater decreases in gas furnace shipments with a standard at condensing levels (see section E, below).

TABLE IV.3.—APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE SHIPMENTS ANALYSIS

Input	NOPR analysis	Final rule analysis
Shipments	Calculated total shipments for replacements based on past shipments and retirement function, and for new homes based on projection of new housing from *(AEO)2005*. The projected market shares in new homes were a function of relative heating equipment prices. Based conversions-upon-replacement on historic survey data. Model used two additional shipment categories to calibrate with GAMA data. Included shipments for mobile home furnace replacement.	Same approach as NOPR, with projection of new housing updated to *AEO2007*.
Replacements in Kind	Replacement of worn-out heating equipment with unit of same equipment type (i.e., furnace or boiler) and same fuel. Applied a replacement probability distribution based on equipment lifetime.	Same approach as NOPR, except for non-weatherized gas furnaces, for which DOE modeled fuel switching in the replacement market according to energy and equipment price trends, using same method and data as for installations in new housing.
Conversions	Replacement of worn-out heating equipment with equipment using a different fuel. Based on utility surveys conducted by American Gas Association that report the numbers of households that converted from oil or electricity to natural gas space heating.	No change.
Installations in New Housing	Installation of heating equipment into new single-family, multi-family, or mobile homes according to construction rates and equipment type market shares. Used housing completions according to *AEO* forecast and modeled fuel market shares according to energy and equipment price trends.	No change.
Gas Furnace Early Replacement.	Early replacement of non-condensing furnaces with more-efficient condensing furnaces. Model calibrated to GAMA data, which show a large increase in condensing furnace shipments in response to rising natural gas prices.	No change.
Conversion from Non-Central Gas Heating to Central Heating with a Gas Furnace.	Conversion from non-central gas heating to central heating with a gas furnace. Model used Residential Energy Consumption Survey data, which show a large increase between 1993 and 2001 in homes with central gas heating that were built before 1990.	No change.

In its assessment of fuel switching from gas to electric heating, DOE estimated that heat pumps and electric resistance furnaces would have the same market shares. The Appliance Standards Awareness Project (ASAP), GAMA, Nordyne, the Northeast Power Coordinating Council, and Rheem commented that market shares might change over the analysis period. (Public Meeting Transcript, No. 107.6 at p. 96; Public Meeting Transcript, No. 107.6 at p. 96; public Meeting Transcript, No. 107.6 at p. 98; Public Meeting Transcript, No. 107.6 at p. 97; Rheem, No. 101 at p. 2) DOE reviewed the projections of heating equipment market shares in EIA's AEO2007, and found that EIA's projections show little change in the national market shares of heat pumps and electric resistance furnaces until 2030. Thus, DOE believes that its assumption of constant market shares is reasonable.

Table IV.4 summarizes the approach and data DOE used to derive the inputs to the NES and NPV analyses for the NOPR, and the changes it made in the analyses for this final rule.

TABLE IV.4.—APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE ANALYSES

Input	NOPR analysis	Final rule analysis
Shipments	Annual shipments from shipments model	See Table IV.3.
Date Products Must Meet Standard.	2015	No change.
Annual Unit Energy Consumption (UEC).	Annual weighted-average values were a function of efficiency level. Base case UEC for non-weatherized gas furnaces accounted for projected share of condensing furnaces.	No change.
Installed Cost per Unit	Annual weighted-average values were a function of efficiency level (established from the LCC analysis).	No change.
Maintenance Cost per Unit	Annual weighted-average values were a function of efficiency level (established from the LCC analysis).	No change.
Energy Prices	AEO2005 forecasts to 2025 and extrapolation beyond 2025.	*AEO2007* forecasts to 2030 and extrapolation beyond 2030.
Energy Site-to-Source Conversion.	Generated by DOE/EIA's NEMS includes electric generation, transmission, and distribution losses.	No change.

TABLE IV.4.—APPROACH AND DATA USED TO DERIVE THE INPUTS TO THE NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE ANALYSES—Continued

Input	NOPR analysis	Final rule analysis
Discount Rate	7-percent and 3-percent real	No change.
Present Year	Future expenses discounted to year 2004	Future expenses discounted to year 2006.

The NPV calculation for the October 2006 proposed rule used marginal energy prices to value energy savings for natural gas and electricity, and average energy prices to value energy savings for fuel oil and liquefied petroleum gas (LPG) from *AEO2005.* 71 FR 59227. ACEEE commented that DOE should use the *AEO2007* price forecast in its analysis for the final rule. (ACEEE, No. 120 at p. 10) DOE used energy price projections from *AEO2007* (which ends in 2030) in its analysis for the final rule. For the years after 2030, DOE applied the average annual growth rate in 2020–2030, except for heating oil prices, for which DOE applied the average annual growth rate in 2015–2030. The above approach follows guidance provided by EIA.[5]

To discount future impacts, DOE used discount rates of both seven percent and three percent, in accordance with the Office of Management and Budget (OMB)'s guidelines contained in Circular A–4, Regulatory Analysis, September 17, 2003. (OMB Circular A–4, § E (September 17, 2003)). NRDC commented that DOE should rely exclusively on a three-percent discount rate in making determinations about the economic value of prospective standards, in part because investments in energy efficiency reduce overall societal risk. (NRDC, No. 131 at p. 16) As mentioned above, OMB recommends using discount rates of both seven percent and three percent for regulatory analysis. DOE concluded that both seven percent and three percent are appropriate to use because they reflect a broad range of discount rates at a national level.

D. Consumer Subgroup Analysis

In analyzing the potential consumer impact of new or amended standards, DOE evaluates the impact on identifiable groups of consumers (i.e., subgroups) that may be disproportionately affected by a new national standard level. For this rulemaking, DOE analyzed the potential effect of standards on households with low income levels and households occupied by seniors, two consumer subgroups of interest. (See TSD, Chapter 11.)

For today's final rule, DOE also analyzed the impact of standards for non-weatherized gas furnaces on households located in northern and southern regions. DOE defined the southern region as comprising states with an average of less than 5,000 heating degree-days (HDD)[6], and the northern region as comprising states with an average of more than 5,000 HDD. DOE also performed an analysis using a definition of the southern region as comprising states with an average of less than 6,000 HDD and a definition of the northern region as comprising states with an average of more than 6,000 HDD. See TSD Chapter 11 for a listing of the states included in each grouping.

E. Manufacturer Impact Analysis

In determining whether a standard for a covered product is economically justified, the Secretary of Energy is required to consider in part ''the economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard.'' (42 U.S.C. 6295(o)(2)(B)(i)(I)) EPCA also requires for an assessment of the impact of any lessening of competition as determined by the Attorney General. (42 U.S.C. 6295(o)(2)(B)(i)(V)) DOE performed the MIA to estimate the financial impact of efficiency standards on the residential furnace and boiler industry and to assess the impact of such standards on employment and manufacturing capacity, and published the results in the October 2006 NOPR. 71 FR 59228–59232, 59240–59245. For this final rule, DOE did not introduce changes to the methodology as described in the October 2006 NOPR, but did update the manufacturers' shipments scenario based on the updated NIA results. (See TSD, Chapter 12.)

F. Employment Impact Analysis

The Process Rule includes employment impacts among the factors DOE considers in selecting a proposed standard. Employment impacts include direct and indirect impacts. Direct employment impacts are any changes in the number of employees for furnace and boiler manufacturers. Indirect impacts are those changes of employment in the larger economy that occur due to the shift in expenditures and capital investment that is caused by the purchase and operation of more efficient furnace and boiler equipment. The MIA addresses direct employment impacts; the employment impact analysis describes indirect impacts.

For today's final rule, DOE estimated indirect national employment impacts using a model of the U.S. economy called IMBUILD (impact of building energy efficiency programs). DOE's Office of Building Technology, State, and Community Programs (now the Building Technologies Program) developed the model. IMBUILD is a personal-computer-based, economic-analysis model that characterizes the relationships among 35 sectors of the economy using national input/output structural matrices, and data from the U.S. Bureau of Labor Statistics (BLS). The IMBUILD model estimates changes in employment, industry output, and wage income in the overall economy of the United States resulting from changes in expenditures in the various sectors of the economy.

In comments on the proposed rule, NRDC stated that DOE failed to consider the economic value of increased employment at TSL 4. (NRDC, No. 131 at p. 12) DOE takes employment impacts into account without quantifying the net economic value of such impacts. While both the IMBUILD input/output model and the direct use of BLS employment data suggest the proposed furnace and boiler standards could increase the net demand for labor in the economy, DOE believes the gains would most likely be very small relative to total national employment. DOE, therefore, concludes only that the furnace and boiler standards are likely to produce employment benefits that are sufficient to offset any adverse impacts on employment in the furnace and boiler or energy industries. (See TSD, Chapter 14.)

G. Regulatory Impact Analysis

The regulatory impact analysis provides a description and analysis of

[5] Memorandum about Energy Price Projections for Federal LCC Analysis, Attachment 2, EIA/DOE, 2/10/2006.

[6] HDDs are quantitative indices demonstrated to reflect demand for energy to heat residential buildings. These indices are derived from daily temperature observations.

the feasible policy alternatives to this regulation and a quantitative comparison of the impacts of the alternatives. In this analysis, DOE also investigated the impact of standards on northern and southern regions. DOE used the NIA spreadsheet, which uses inputs generated by LCC spreadsheets constructed to separately analyze the northern and southern regions, to generate the results presented in the NOPR for both regions. DOE performed the national LCC analysis on the basis of the nine Census divisions, plus four large States (New York, California, Texas, and Florida), rather than on a State-by-State basis. Commenting on the NOPR, ASAP stated that the results for the northern region, defined as areas with more than 6,000 HDDs, appear to be incorrect. (Public Meeting Transcript, No. 107.6 at p. 154)

For the NOPR analysis of the potential impacts of regional standards, DOE based the distribution of furnace efficiency in the base case on data that GAMA provided on the percentage of condensing furnace sales in each State. DOE combined the State-level GAMA data into Census divisions, and then assumed condensing gas furnaces were installed in households solely on the basis of climate (i.e., high HDDs). This assumption led to the comparatively small energy savings estimated to result from a condensing-level standard for the northern region.

Upon review, DOE determined that the assumption that the existing (and future) market for condensing furnaces (absent a standard) was likely to be concentrated in the coldest states was not an accurate reflection of the State-level data that GAMA provided. By using distribution assumptions that are based on the State-level data, DOE subsequently developed an alternative analysis, which it now believes is a better indicator of the energy savings likely to result in specified regions from various standard levels. In the revised analysis, a much lower percentage (45 percent) of households in the States with HDDs of 6,000 or higher is assigned condensing furnaces. This share is half of the comparable 90 percent value in the NOPR analysis and is close to the 48 percent share of condensing furnaces for the 20 States with an average HDD of 6,000 or higher in the GAMA shipments data. See Appendix V of the TSD for further discussion.

H. Utility Impact Analysis

The utility impact analysis estimates the change in the forecasted power generation capacity for the Nation. This analysis separately determines the changes in energy supply and demand as a result of natural gas, fuel oil, LPG, or electricity residential consumption savings due to the standard. DOE calculated these changes using the NEMS–BT computer model.[7] The analysis output provides a forecast for the needed generation capacities at each TSL. The estimated net benefit of the standard is the difference between the generation capacities forecasted by NEMS–BT and the *AEO2006* Reference Case.

DOE obtained the energy savings inputs associated with electricity and natural gas consumption savings from the NES analysis. These inputs reflect the effects of efficiency improvement on furnace energy consumption, including both fuel (natural gas, fuel oil, and LPG) and electricity. The inputs also reflect the impacts associated with the market shift from natural gas heating to electric heating projected to occur at TSLs that result in an increased installed cost for gas furnaces. See Chapter 13 of the TSD for further discussion.

The American Gas Association (AGA) stated that DOE's approach for analyzing utility impacts, and in particular its evaluation of market shifts from gas to electric heating equipment, does not adequately account for impacts on gas utilities. (AGA, No. 137 at p. 6) Historically, DOE's approach for the utility impact analysis has been to only evaluate the impact of market shifts associated with standards on utility energy sales. DOE has not been able to characterize what the impacts of standards would be on gas utilities, other than the financial impacts as measured by sales. Thus, DOE was not able to perform further evaluation of the gas utility impacts for the furnace and boiler standards rulemaking.

I. Environmental Analysis

Under 42 U.S.C. 6295(o)(2)(B)(i)(VI), DOE estimated the environmental impacts of the standards established in today's final rule. DOE estimated direct emissions impacts at the household level as well as impacts on power plant emissions. While DOE regulating furnace and boiler electricity use, the electricity consumption of these appliances affects power plant emissions. As discussed in the NOPR, DOE calculated the reduction in power plant emissions of CO_2 and NO_X using the NEMS–BT computer model.[8] DOE does not report estimated reduction in power plant emissions of SO_2 because any such reduction resulting from an efficiency standard would not affect the overall level of SO_2 emissions in the U.S.[9]

The operation of most furnaces and boilers requires use of fossil fuels, and results in household emissions of CO_2, NO_X, and SO_2 at the sites where appliances are used. NEMS–BT provides no means for estimating such household emissions, so DOE calculated separate estimates of the effect of the standards on household emissions of CO_2, NO_X, and SO_2, based on emissions factors derived from the literature. DOE reports household SO_2 emissions savings, because the SO_2 emissions caps do not apply to household emissions.

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NRDC and Dow Chemical commented that, although DOE had quantified emissions savings, it failed to put an economic value on them. (NRDC, No.

[7] NEMS, which is available in the public domain, is a large, multi-sectoral, partial-equilibrium model of the U.S. energy sector. The EIA uses NEMS to produce its AEO—a widely recognized baseline energy forecast for the U.S. DOE used a variant known as NEMS–BT.

[8] Power sector NO_X emissions impacts will be affected by the Clean Air Interstate Rule (CAIR), which the U.S. Environmental Protection Agency (EPA) issued on March 10, 2005. CAIR will permanently cap emissions of NO_X in 28 eastern States and the District of Columbia. 70 FR 25162 (May 12, 2005). As with SO_2 emissions, a cap on NO_X emissions means that equipment efficiency standards may result in no physical effects on these emissions. When NO_X emissions are subject to emissions caps, DOE's emissions reduction estimate corresponds to incremental changes in emissions allowance credits in cap-and-trade emissions markets rather than physical emissions reductions. Therefore, while the emissions cap may not result in physical emissions reduction from the proposed standards, it does produce an environment-related economic benefit in the form of emissions allowance credits.

[9] The Clean Air Act Amendments of 1990 set an SO_2 emissions cap on all power generation. The attainment of this target is flexible among generators and is enforced through the use of emissions allowances and tradable permits. Accurate simulation of SO_2 trading implies that the effect of efficiency standards on physical emissions will be near zero because emissions will always be at or near the allowed ceiling. However, although there may not be an environmental benefit from reduced SO_2 emissions from electricity savings, there still may be an economic benefit. Electricity savings can decrease the need to purchase or produce SO_2 emissions allowance credits, which decreases the costs of complying with regulatory caps on emissions.

131 at p. 13; NRDC and Dow Chemical, No. 132 at p. 9) In keeping with the guidance of the 1996 Process Rule, DOE's analysis of the environmental impacts of standards included estimated impacts on emission of carbon and relevant criteria pollutants. 61 FR 36983 (July 15, 1996). For the purpose of promulgating new standard levels for furnaces and boilers, DOE considers the potential changes to physical emission resulting from new standards. The detailed environmental analysis is part of the TSD.

V. Discussion of Other Comments

Since DOE opened the docket for this rulemaking, it received more than 150 comments from a diverse set of parties, including manufacturers and their representatives, States, energy conservation advocates, consumer advocates, and utilities. Comments regarding the analytic methodologies DOE used are discussed in section IV of this preamble. Other comments addressed the burdens and benefits associated with new energy efficiency standards, the information DOE used in its analyses, results of and inferences drawn from the analyses, impacts of standards, the merits of the different TSLs DOE considered, other issues affecting adoption of standards for residential furnaces and boilers, and the DOE rulemaking process. DOE addressed the comments raised regarding the ANOPR in the October 2006 NOPR. Comments received on the October 2006 proposed rule are addressed below.

A. Information and Assumptions Used in Analyses

As a basis for analysis for this final rule, DOE has continued to use the types of data as explained in the October 2006 NOPR. 71 FR 59213–59234. For the final rule, DOE revised some inputs and expanded some of the data sources in response to stakeholder comments on the October 2006 proposed rule. These revisions are discussed below.

1. Engineering Analysis

In the October 2006 proposed rule analyses, DOE used a five-year average of materials prices from years 2000 through 2004. 71 FR 59216. For the final rule, DOE revised the material price averages used in the cost model to include material price data from 2005 and 2006. For this rulemaking, DOE believes a five-year span is the longest span that would still provide appropriate weighting to current prices experienced in the market. DOE calculated a new five-year average materials price for cold rolled steel, aluminized steel, galvanized steel, painted cold rolled steel, and stainless steel. DOE used the BLS Producer Price Indices (PPIs) for cold rolled steel and stainless steel spanning from 2002 to 2006 to calculate new averages, which incorporate the changes within each material industry and inflation. Finally, DOE adjusted all averages to 2006$ using the gross-domestic-product implicit-price deflator.

As was the case for the October 2006 proposed rule, DOE created two scenarios for the material-price-sensitivity analysis: a low-bound and a high-bound scenario. DOE calculated the low-bound scenario by finding the year ranging between 2002 and 2006 with the lowest cost of cold rolled steel, which was 2002. DOE then used the annual prices for all other materials in 2002 and applied a 15-percent reduction to each of the raw material costs. Likewise, DOE calculated the high-bound scenario using the annual average price for each of the raw materials from 2006, when prices of raw materials were uncharacteristically high. DOE expressed both the low-bound scenario and the high-bound scenario in 2006$. DOE evaluated the results of the material-price-sensitivity analysis, using all three material-cost scenarios, in the engineering analysis and then used them as inputs for the LCC analysis. The results for the material-price-sensitivity analysis are presented in Appendix Z of the final rule TSD.

GAMA commented that DOE's analysis for non-weatherized gas furnaces appears to be in error, especially as related to the 81-percent AFUE option, for several reasons. First, while DOE estimated in the October 2006 NOPR that eight percent of non-weatherized gas furnace installations would require Category III venting at 81-percent AFUE, GAMA stated that this number is too low. Second, DOE concluded in the October 2006 NOPR that a significant fraction of the replacement installations will require a Type B vent connector, but GAMA pointed out that DOE only added the additional costs for these connectors to 40 percent of the installations. Lastly, GAMA stated its belief that the number of horizontal venting configurations assumed in the October 2006 NOPR analyses is too low.

Regarding GAMA's first point, DOE used the approach described by GAMA in the ANOPR analysis. For the NOPR, DOE determined that non-weatherized gas furnaces at 81-percent AFUE when applied in vertical venting installations fall into Category I. To GAMA's second point, DOE accounted for the cost of Type-B double-wall vent connectors for all replacement installations. GAMA appears to be referring to the fraction of existing models that already have a double walled vent connector in DOE's Installation Model, which was approximately 40 percent as discussed in the NOPR. To GAMA's last point regarding the number of horizontal venting configurations, DOE's October 2006 proposed rule analysis based the number of non-condensing horizontal vent configurations on the Gas Research Institute's venting survey (see NOPR TSD Chapter 6). DOE then verified this percentage in consultations with installers. Consequently, DOE did not revise the number of horizontal venting configurations for today's final rule.

2. Life-Cycle Cost Analysis

The base case forecasts equipment that consumers are expected to purchase in the absence of new standards. In the NOPR analysis, DOE assigned gas furnaces to sampled housing units in the base case to reflect the trend toward a higher market share for condensing furnaces, as shown in shipments data through 2003, which GAMA provided. DOE also based the projected market share of condensing furnaces in 2015 on an evaluation of the correlation between condensing furnace market share and the natural gas price for the 1990–2003 period, projected natural gas prices from *AEO2005,* and market factors that could sustain the condensing furnace market share even with a lower gas price. The projected condensing furnace market share for 2015 was 35.6 percent. Therefore, for the LCC analysis base case, DOE assigned condensing furnaces to 35.6 percent of the sampled housing units with non-weatherized gas furnaces.

GAMA stated the market share for condensing furnaces might continue to grow because of growth in the replacement market, and thus DOE's assumption may be low. (Public Meeting Transcript, No. 107.6 at p. 105) Lennox commented that the market share for condensing furnaces should consider the replacement market. (Public Meeting Transcript, No. 107.6 at p. 105) Rheem disagreed with DOE's estimate of market share for condensing furnaces, and stated that the share will be higher if historic trends continue. (Rheem, No. 138 at p. 5) ACEEE stated that the market share for condensing furnaces will depend on the price of natural gas and that DOE's assumptions should be internally consistent and reflect the price projections it uses. (Public Meeting Transcript, No. 107.6 at p. 102) DOE found that the empirical,

national-level data strongly support a correlation between condensing furnace market share and the natural gas price. The natural gas projections DOE used in this rulemaking (*AEO2007*) forecast that the national-average natural gas price in the period to 2015 does not exceed the recent level of prices. The condensing furnace market share in 2005 was approximately 35 percent. DOE determined that its assumption of a market share of 35.6 percent in 2015 reflects the empirical correlation.

3. Manufacturer Impact Analysis

NRDC stated that DOE's assessment of the impact of TSL 4 on manufacturers is flawed because a decline in sales of furnaces associated with TSL 4 would result in increased sales of heat pumps, many of which are sold by the furnace manufacturers. (NRDC, No. 131 at p. 14) Pacific Gas and Electric (PG&E) also commented that DOE's analysis overstates the deleterious effect of TSL 4 on INPV. PG&E commented that experience with other standards has shown that the costs and competitiveness difficulties presented by improved energy efficiency standards are less burdensome in implementation than initially projected. (PG&E, No. 129 at p. 1)

While some larger manufacturers of furnaces and boilers sell both heat pumps and furnaces, DOE is tasked with assessing the impacts of increased efficiency standards on furnace and boiler manufacturers, not on the heating, ventilation, and air-conditioning industry as a whole. In the furnace and air conditioner businesses, some manufacturers produce both types of products, switching primarily to furnaces in the winter and air conditioners in the summer. Heat pumps, on the other hand, tend to be manufactured in other manufacturing facilities. For the large production volume shifts found for TSL 4, DOE determined that the furnace divisions of large companies likely will be impacted as analyzed in the October 2006 proposed rule MIA. The capital (equipment) and labor (location) in a manufacturing facility cannot easily be transformed from manufacturing furnaces to manufacturing heat pumps. For small companies, which focus on fewer types of product lines, the material costs are less interchangeable. DOE also notes that, under TSL 4, other options—such as electric furnaces—become a choice for consumers. In light of these uncertainties, DOE determined that its MIA captures the potential range of impacts at TSL 4 on furnace manufacturers.

NRDC commented that, in determining industry value, DOE should not give equal weight to scenarios of product sales created by DOE and those provided by manufacturers. (NRDC, No. 131 at pp. 14–15) DOE looked at a range of impacts for each of the six product classes of furnaces and boilers and presented this entire range of results in the October 2006 NOPR. In doing so, DOE used both the NES shipments projections and the manufacturers' shipments scenario to assess the range of impacts on the industry value at each TSL. Although this final rule presents results using both shipments scenarios for the MIA, DOE only used the NES shipments scenario to assess the impacts on the Nation in the NIA.

NRDC stated its belief that DOE's assumptions regarding markups biased the INPV result. (NRDC, No. 131 at pp. 14–15) NRDC also questioned DOE's assumption that the industry cost structure will not decrease. NRDC stated that manufacturers could distinguish value-added products in the mid-90s AFUE range based on modulating capacity and continue to collect higher markups on above-standard products. NRDC further stated that, as manufacturers gain more experience with 90-percent AFUE products, the price of the products will come down; it requested that the cost structure in DOE's analysis account for this. (NRDC, No. 131 at pp. 14–15)

With regard to markups, DOE considered up to four distinct markup scenarios to bound the range of expected product prices following standards. For each product class, DOE used the markup scenarios that characterize the markup conditions described by manufacturers, and that reflect the type of market responses manufacturers expect as a result of standards. Details of the markup scenarios by product class were presented in the October 2006 NOPR. 71 FR 59240. DOE has determined that these scenarios capture the range of variability within the furnace and boiler industry.

As to NRDC's point on the industry cost structure, for condensing, non-weatherized gas furnaces that are already made in high volumes in an industry with decades of manufacturer experience, the potential cost of innovation prompted by higher standards is limited to that of an already mature industry. DOE recognizes that manufacturers' continuous improvement programs will continue to reduce future costs, with or without increased efficiency standards. DOE believes these programs are not a result of energy conservation standard rulemakings and are not appropriate to consider when estimating the impacts of energy conservation standards. DOE estimated the manufacturing cost of a condensing furnace to be $422.85 in the engineering analysis and DOE recognizes these costs could be reduced in a standards case scenario. Therefore, the MIA analysis excludes this effect, and shows a range of impacts on the industry results from an amended standard.

Rheem stated that DOE's assessment of impacts on manufacturers is inadequate with respect to domestic manufacturing employment, capacity, plant closures, and loss of capital investment. Rheem commented that domestic manufacturing of refrigerators has declined substantially as a result of three energy standards and the phaseout of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), since manufacturers have chosen to invest outside the USA in new facilities rather than upgrade their domestic facilities. Rheem summarized by stating that the cumulative burden of environmental and efficiency regulations has been a factor in the consolidation of the domestic appliance industry. (Rheem, No. 138 at p. 3)

DOE notes that the two most significant regulatory actions affecting the furnace and boiler industries are more stringent Federal energy conservation standards for residential and commercial air conditioners, and the EPA-mandated phaseout of hydrofluorocarbon (HFC) and HCFC refrigerants. DOE is aware that manufacturers are working to redesign all of the product lines of residential air conditioners and have allocated most of their capital resources for redesigning and retooling their production lines to meet the new minimum efficiency standard and refrigerant phaseout. DOE quantified the anticipated level of investment needed to meet each of these two regulatory actions along with others facing the industry in Chapter 12 of the NOPR TSD. 71 FR 59244–29245.

In the October 2006 NOPR, DOE specifically sought comment on information that would allow it to monetize changes in warranty costs resulting from the installation of products at near-condensing levels. 71 FR 59258. GAMA stated that DOE should consider changes in warranty costs related to gas-fired boilers at 84-percent AFUE. However, GAMA also stated that it is inappropriate with respect to anti-trust considerations for manufacturers to discuss information related to monetizing changes in warranty costs. (Public Meeting Transcript, No. 107.6 at pp. 108–109)

Rheem stated that it is inappropriate to provide DOE with information that attempts to monetize the changes in warranty costs resulting from installation of products at near-condensing levels. Rheem further commented that these products should not be considered as an option due to their unacceptable safety and reliability. (Rheem, No. 101 at p. 2; Public Meeting Transcript, No. 107.6 at p. 82; Rheem, No. 138 at p. 6) Trane stated that it is inappropriate for manufacturers to discuss information related to monetizing changes in warranty costs for products at near-condensing levels. (Public Meeting Transcript, No. 107.6 at p. 108)

In light of the comments, DOE was not able to monetize the changes in warranty costs resulting from the installation of products at near-condensing levels. However, as discussed in section VI of this preamble, safety concerns for standards at near-condensing levels were a greater factor in considering such standards, which were eventually rejected.

B. Other Issues

1. Joint Stakeholder Recommendation for Boilers

On July 14, 2006, GAMA and ACEEE, on behalf of 28 residential boiler manufacturers and four energy efficiency organizations, submitted a joint recommendation for new national standards for residential boilers that would consist of a performance requirement (minimum AFUE levels) and design requirements. Table V.1 exhibits the performance and design requirements in the joint stakeholder recommendation for boilers.

TABLE V.1.—JOINT STAKEHOLDER RECOMMENDATION FOR BOILERS PERFORMANCE AND DESIGN REQUIREMENTS

Product class			Joint stakeholder recommendation for boilers
Gas Boiler	Water Steam	82% 80	No Standing Pilot * Temperature Reset **. No Standing Pilot *.
Oil-Fired Boiler	Water Steam	84 82	Temperature Reset. None.

* The manufacturer shall not equip gas boilers with standing pilots.

** The manufacturer shall equip hot water heating boilers with automatic means for adjusting the temperature of the water supplied by the boiler such that an incremental change in inferred heat load produces a corresponding incremental change in supply water temperature. When there is no inferred heat load, such automatic means shall adjust the supply water temperature to no more than 140 deg. F. The boiler shall be operable only when the automatic means is installed. These requirements should be implemented five (5) years after publication of the Final Rule.

For gas-fired boilers, the recommendation calls for a ban on standing pilots. For gas-fired water boilers only, it suggests two design requirements: In addition to the ban on standing pilots, the recommendation also requires a ''temperature reset'' feature that automatically adjusts the boiler output according to the outdoor ambient air temperature. For oil-fired water boilers, the recommendation contains the design requirement for the same ''temperature reset'' feature.

In the October 2006 NOPR, DOE determined that the recommended standards in the joint stakeholder recommendation are beyond the scope of its statutory authority. 71 FR 59209. In comments on the October 2006 proposed rule, all of the parties to the joint recommendation urged DOE to reconsider and adopt the standards in the recommendation. (Public Meeting Transcript, No. 107.6 at p. 58; ACEEE, No. 120 at p. 4; Public Meeting Transcript, No. 107.6 at pp. 69, 142; Burnham, No. 99 at pp. 1–3; Public Meeting Transcript, No. 107.6 at p. 38; GAMA, No. 102 at p. 2; GAMA, No. 116 at p. 2; Public Meeting Transcript, No. 107.6 at p. 28; Lochinvar, No. 106 at p. 2; Public Meeting Transcript, No. 107.6 at p. 74)

Despite these comments, DOE cannot promulgate design requirements for unspecified products: The plain language of section 321(6)(B) of EPCA limits design requirements to only those products for which design requirements are specified in the statute. (42 U.S.C. 6291(6)(b)) Furnaces are not one of those specified products. DOE legally cannot establish a design requirement for furnaces.

Congress's establishment of a design requirement on an unspecified product, i.e., a ceiling fan, does not lift the bar on DOE placing design requirements on unspecified products as suggest by ACEEE. (ACEEE, No. 120 at p. 4) While Congress may have amended provisions of EPCA to require design requirements in conjunction with performances requirements, it did not amend section 321(6)(B) of EPCA, 42 U.S.C. 6291(6)(B), which remains applicable to furnaces and boilers.

Burnham suggested that section 325(r) of EPCA (42 U.S.C. 6295(r)) grants DOE the authority to add design requirements covered by performance standards under certain conditions. (Burnham, No. 99 at pp. 1–3) Section 325(r) states in relevant part:

> Any new or amended energy conservation standard prescribed under this section * * * may include any requirement which the Secretary determines is necessary to assure that each covered product to which such standard applies meets the required level of energy efficiency * * * specified in such a standard.

(42 U.S.C. 6295(r)) Despite Burnham's suggestion, the plain language of section 325(r) grants authority to establish requirements necessary to assure compliance with a required level of energy efficiency. It does not grant authority to establish requirements that affect the required level of energy efficiency, e.g., design requirements. Further, if the language were such that DOE could interpret the language as broadly as Burnham suggested, the distinction made in section 321(6)(A) and (B) between products for which design standards can be established and those for which such standards cannot, would be rendered meaningless.

2. Regional Standards and Waiver From Federal Preemption for States

In the October 2006 NOPR, DOE stated that the establishment of regional standards or design requirements for residential furnaces and boilers is beyond the scope of DOE's statutory authority. 71 FR 59209; see also, 69 FR 45420, 45425 (July 29, 2004). DOE received numerous comments advocating the adoption of separate standards for northern and southern regions. (ACEEE, No. 120 at p. 3; Public Meeting Transcript, No. 107.6 at p. 59; Public Meeting Transcript, No. 107.6 at p. 54; Public Meeting Transcript, No. 107.6 at p. 68; Office of the Ohio Consumers' Counsel (OCC), No. 125 at p. 9; National Consumer Law Center (NCLC), No. 108 at p. 2; Belmont Housing Trust, Inc., No. 127 at p. 8; City

of Boston, No. 115 at p. 1; Consumer Group, No. 121 at pp. 9–10; Northeast Division of Energy Resources (NEDER), No. 123 at p. 4; New Hampshire Office of Consumer Advocate (NHOCA), No. 134 at p. 1; State of Michigan (SOM), No. 114 at p. 1; State of New Hampshire Office of Energy and Planning, No. 139 at p. 1; NRDC, No. 131 at p. 18; Public Meeting Transcript, No. 107.6 at p. 116; NRDC, No. 132 at p. 10; Ohio Department of Development (ODD), No. 124 at p. 1; Western Electricity Coordinating Council (WECC), No. 113 at p. 1) DOE received comments that DOE incorrectly determined that it cannot implement regional standards. Conversely, DOE also received comments opposing the adoption of separate standards for northern and southern regions. (Air Conditioning Contractors of America, No. 135 at p. 1; Air-Conditioning and Refrigeration Institute (ARI), No. 133 at p. 1; National Propane Gas Association (NPGA), No. 142 at p. 3)

DOE recognizes the potential benefit that could be achieved through regional standards. As discussed in the October 2006 NOPR, DOE analyzed a regional regulatory scheme based on heating degree-days. 71 FR 59253. This scheme contemplated efficiency standards for non-weatherized gas furnaces only, depending on the region of the country.

DOE modeled the policy of regional performance standards by aggregating States into two broad geographic regions based on climate (i.e., based on heating degree-days). DOE selected the efficiency level for this scheme based on maximizing consumer NPV. Under this analysis the TSL projected to yield the maximum consumer NPV at a seven-percent discount rate for the cold-climates (i.e., ≥5,000 heating degree days and ≥6,000 heating degree days) was the proposed TSL 4, with the proposed TSL 2 for the warm climates. The projected results for both regions, the proposed TSL 2 (South) and the proposed TSL 4 (North), combined were estimated to yield higher energy savings than the than the proposed TSL 2 standard levels. The projected results for both regions combined were estimated to yield greater national NPVs (at 7% discount rate) than the proposed levels of TSL 2, applied as national standards. A more detailed discussion of this analysis is provided in the October 2006 NOPR and in the February 9, 2007 Notice of Data Availability (72 FR 6184).

However, DOE has determined that it does not have authority under EPCA to establish regional standards. The language of EPCA demonstrates that the Secretary's authority to establish and amend standards for furnaces and boilers is limited to establishing and amending a single national standard for a particular type of furnace and boiler, as opposed to a national standard plus one or more regional standards. Section 325(a)(2) of EPCA authorizes the ''Secretary to prescribe amended or new energy conservation standards for each type (or class) of covered product.'' (42 U.S.C. 6295(a)(2)) In defining an energy conservation standard, EPCA employs ''a performance standard'' or ''a design requirement'' in the singular. (42 U.S.C. 6291(6)) This use of the singular indicates that the Secretary generally may only set one energy conservation standard for a product.

Further, were the language of EPCA not clear as to DOE's authority for setting national standards, interpreting section 325 as generally prohibiting the establishment of regional standards is reasonable, particularly when section 325 is read in total. Consumer Groups stated that, under 1 U.S.C. section 1, the use of the singular tense includes consideration of the plural tense unless context indicates otherwise. (No. 121 at p. 10) However, the context of EPCA indicates that the reliance on the singular tense in the definition of energy conservation standard for the purpose of the Secretary establishing amended standards for furnaces and boilers is proper.

EPCA specifies that the Secretary can only set multiple standards for a product if that product has more than one major function:

> The Secretary may set more than 1 energy conservation standard for products that serve more than 1 major function by setting 1 energy conservation standard for each major function.

(42 U.S.C. 6295(o)(5)). If DOE could adopt multiple performance standards or design requirements under a single conservation standard, as suggested by commenters, EPCA's limit of one conservation standard per major product function would be meaningless.

Additional commenters stated that because Congress established in certain instances multiple requirements on a single product, section 321(6) should be read more broadly to define a ''conservation standard.'' [10] However, while Congress has enacted multiple performance and design standards for covered products, the Secretary's authority to do so is limited under section 325(o)(5) as stated above.

Moreover, the Senate Report language accompanying the amendments to EPCA under the National Appliance Energy Conservation Act (NAECA; Pub. L. 95–619) indicates that the Secretary is to set national standards. ''The purpose of [NAECA] is to reduce the Nation's consumption of energy and to reduce the regulatory and economic burdens on the appliance manufacturing industry through the establishment of *national* energy conservation standards for major residential appliances.'' S. Rep. No. 100–6, at 2 (1987) (Emphasis added).

The two basic provisions of the NAECA amendments to EPCA concern the establishment of Federal standards and the preemption of State standards. Id. Although NAECA goes on to state that States have the ability to petition DOE for a waiver from the national standard, NAECA warns that achieving such a waiver is ''difficult,'' again indicating a preference for a national standard. Id.

As a policy matter, national standards established under EPCA enable DOE to address the Nation's need to conserve energy while reducing the regulatory burden on manufacturers. The establishment of regional standards would be overly complicated due to the structure of DOE's enforcement authority as established in EPCA. Under EPCA, DOE's enforcement authority generally applies to products as manufactured. (42 U.S.C. 6302 and 6303) Under current authority, enforcement of Federal regional standards would be difficult given that a furnace or boiler could be manufactured for compliance in one region, yet be easily transported to a region in which it would be noncompliant. The potential interaction of various standards between regions, the subsequent potential for products to be shipped and installed in regions in which they are not compliant, and the resulting impact on energy savings would have to be considered when establishing standards. DOE recognizes the potential for regional standards to increase the net benefits of energy conservation programs under certain circumstances. However, establishing regional standards in the context of DOE's current enforcement authority would make it more difficult to achieve the goals of improved energy conservation and reduced regulatory burden.

While DOE is prohibited from promulgating regional standards under the authority in section 325 of EPCA, States can apply for waivers from Federal preemption under section 327 of EPCA. (42 U.S.C. 6297) In the October 2006 NOPR, DOE discussed the necessary conditions in order for it to grant States a waiver from Federal

[10] Section 325(ff) of EPCA establishes multiple requirements for ceiling fans. (42 U.S.C. 6295(ff)).

preemption of State energy efficiency standards for appliances subject to Federal regulation, as established in 10 CFR 430.41(a)(1). 71 FR 59209.

DOE received several comments with regard to the waiver from Federal preemption discussion in the NOPR. Some commenters expressed concern that DOE was encouraging States to apply for waivers. (Public Meeting Transcript, No. 107.6 at p. 111; AGA, No. 103 at p. 5; Association of Home Appliance Manufacturers (AHAM), No. 141 at pp. 1–2; ARI, No. 133 at pp. 2–3; GAMA, No. 102 at pp. 2–3; GAMA, No. 116 at p. 2; Public Meeting Transcript, No. 107.6 at p. 30; Lennox, No. 130 at p. 3; NPGA, No. 142 at pp. 3–4; Rheem, No. 138 at p. 3; Public Meeting Transcript, No. 107.6 at p. 113; GAMA, No. 153 at p. 1) Other commenters supported DOE giving States guidance with regard to waivers from Federal preemption. (Public Meeting Transcript, No. 107.6 at p. 112; ACEEE, No. 120 at pp. 2–3; Public Meeting Transcript, No. 107.6 at p. 70; Consumer Groups, No. 121 at p. 2; Public Meeting Transcript, No. 107.6 at p. 116; NEDER, No. 123 at p. 3; NRDC, No. 131 at p. 18; NRDC and Dow Chemical, No. 132 at p. 10; New York State Energy Research and Development Authority (NYSERDA), No. 117 at p. 2; OCC, No. 125 at p. 9; SOM, No. 114 at p. 2; WECC, No. 113 at p. 2)

While the October 2006 NOPR provided a discussion of the necessary elements of a petition for waiver from Federal preemption, DOE recognizes the practical limitations of the process as well as the potential burden resulting from multiple standards. For example, DOE suggested that a State may include information regarding the efficiencies of product shipments to that State. 71 FR 59210. One commenter raised concern that such information may be considered proprietary or confidential by the manufacturers or trade organizations. (NCLC, No. 108 at p. 19) However, DOE notes that inclusion of such information was a suggestion of what a State should consider including if available, and that such information is not required for a State waiver petition.

NCLC expressed concern that petitions filed by more than one State, especially if filed by contiguous or nearby States with similar HDDs, could be deemed in per se violation of the requirement that a petition must demonstrate an ''unusual and compelling State or local energy interest.'' (NCLC, No. 108 at p. 19) DOE provided guidance on this matter in the denial of the California petition for waiver from Federal preemption for residential clothes washer standards. 71 FR 78157 (December 28, 2006). In that notice, DOE stated that whether a State has an ''unusual and compelling State interest,'' DOE will evaluate that interest in terms of national averages. 71 FR 58161.

DOE has estimated that the potential energy savings likely under a scenario in which all northern States with 5000 HDD or 6000 HDD obtained waivers at a level of 90-percent AFUE is 2 quads and 1.45 quads, respectively. While DOE does not have authority to issue regional standards, EPCA does provide an avenue for DOE to consider this savings through the waiver provision in section 327(d). As stated in the October 2006 NOPR, and as required under section 327(d), DOE would be required to evaluate the benefit of such savings from State level standards against the potential effects on manufacturers and consumer. 71 FR 59210; 42 U.S.C. 6297(d)(3) and (4).

3. Effective Date for New Standards

In the October 2006 NOPR, DOE proposed approximately an eight-year implementation period for the proposed standards; i.e., DOE proposed an effective date in 2015. 71 FR 59223. DOE noted that EPCA had directed DOE to publish a final rule to determine whether to amend standards for furnaces and boilers by January 1, 1994, and that any amendment shall apply to products manufactured on or after January 1, 2002. (42 U.S.C. 6295(f)(3)(B)) DOE applied the eight-year implementation period of the EPCA schedule to determine the effective date of the proposed standard. 71 FR 59233.

NRDC stated that the eight-year implementation period is not required by law and that the earlier central air conditioner efficiency standard rulemaking established an implementation period shorter than that provided in the statute. (NRDC, No. 131 at p. 13; Public Meeting Transcript, No. 107.6 at pp. 54, 150) ACEEE stated that large amounts of equipment already meet the proposed 2015 standards and are already available on the market. (ACEEE, No. 107 at pp. 61, 149) For furnaces, ACEEE suggested that DOE rely on a five-year implementation period associated with the second round of rulemaking for furnaces and boilers specified in section 325 of EPCA. (42 U.S.C. 6295(f)(3)(C)) With regard to boilers, ACEEE requested that DOE use the dates in the ACEEE-GAMA joint recommendation, given that manufacturers have agreed on those timeframes. (ACEEE, No. 120 at p. 9) A number of other stakeholders also stated that DOE should make the effective date earlier than 2015. (Public Meeting Transcript, No. 107.6 at p. 69; North American Insulation Manufacturers Association, No. 136 at p. 2; NEDER, No. 123 at p. 6; NHOCA, No. 134 at p. 1; NRDC and Dow Chemical, No. 132 at p. 9; NYSERDA, No. 117 at p. 2; OCC, No. 125 at p. 9; ODD, No. 124 at p. 1; State of New Hampshire Office of Energy and Planning (OEP), No. 139 at p. 1; South Coast Air Quality Management District, No. 128 at p. 1; SOM, No. 114 at p. 2; WECC, No. 113 at p. 2; National Multi Housing Council, No. 148 at p. 2) Other stakeholders stated that DOE should maintain the effective date given in the NOPR. (Public Meeting Transcript, No. 107.6 at p. 150; GAMA, No. 116 at p. 4; GAMA, No. 153 at p. 1; Rheem, No. 156 at p. 2; Midwest Energy Efficiency Alliance, No. 150 at p. 1)

The standards adopted in today's final rule are applicable to products manufactured on or after the date 8 years following publication of this notice of final rulemaking. DOE is maintaining an eight-year implementation period consistent with EPCA. NRDC is correct that DOE established standards with implementation periods substantially shorter than that specified in EPCA for central air conditioners. However, in that instance all of the participants in the rulemaking, including representatives of the manufacturers who would have to comply with the standards and who had expressed a view about the matter, had agreed that five years (the period provided in the statute) of lead time was not needed for central air conditioner manufacturers to come into compliance with the standards. 69 FR 50997, 50998 (Aug. 17, 2004); 67 FR 36368, 36394 (May 23, 2002). There is no similar consensus among furnace and boiler manufacturers.

In today's final rule, DOE is providing a lead time consistent with that provided under EPCA. Today's final rule has a compliance date that begins on the date 8 years following publication of this notice.

4. Consumer Benefits From Reduction in Natural Gas Prices Associated With a Standard of 90-Percent AFUE or Higher for Non-Weatherized Gas Furnaces

In the October 2006 NOPR, DOE stated that it believed it would be unable to consider the potential impact of energy efficiency standards on natural gas prices because DOE believed that the analytical methods necessary to estimate such an impact were not available. 71 FR 59210. DOE

acknowledged a then recent study [11] that considered the potential impacts of furnace and boiler standards on natural gas prices, but stated that DOE did not find that the study provided any conclusive evidence. 71 FR 59280.

NRDC and Dow Chemical challenged DOE's decision not to consider the potential impacts of reductions in natural gas use due to furnace and boiler standards with increased stringency, including the impact on natural gas prices. Commenters stated the Wiser study as well as an analysis performed by ACEEE indicate ''major influences of efficiency on price.'' (NRDC and DOW, No. 132 at p. 4) NRDC and Dow stated that such a price impact provides a substantial economic benefit that may be estimated using EIA's NEMS model. (NRDC and Dow, No. 132 at p. 10)

In response to these comments, DOE undertook further review of the issue of the potential impact of residential furnace and boiler energy efficiency standards on natural gas prices. A review of the economic literature indicates that there is support for the idea that an impact will occur and that that impact would result in a reduction in overall natural gas prices. DOE conducted a preliminary analysis using a version of the 2007 NEMS-BT, modified to account for energy savings associated with possible standards. The preliminary analysis estimated that gas demand reductions resulting from a 90-percent-AFUE non-weatherized gas furnace standard would reduce the U.S. average wellhead natural gas price by an average of 0.7 cents per million Btu over the 2015–2030 forecast period and would reduce the average user price of gas by an average of 1.4 cents per million Btu.[12]

The projected change in the natural gas price varies among the end use sectors. DOE estimated that natural gas prices would decrease for the industrial and electric power sectors, and increase for residential consumers. The estimated average price changes amount to a decrease of 0.7 cents per million Btu for the industrial sector and of 0.6 cents per million Btu for the electric power sector, an increase of 4.2 cents per million Btu for the residential sector, and no change for the commercial sector. The increase in the residential price occurs because the fixed charges (*e.g.*, transmission infrastructure costs) are spread over fewer million Btu of gas sales in the standards case, thus placing upward pressure on the average price per million Btu.

A projected decrease for the electric power sector would likely result in a small reduction in electricity prices across all sectors. Although the estimated reduction in average natural gas prices is small, the estimated economy-wide savings in natural gas expenditures over the 2015–2030 forecast period have an estimated net present value of $1.7 billion at a seven-percent discount rate.[13]

In addition to conducting its own analysis using NEMS, DOE reviewed the results of: (1) Studies that used NEMS to investigate the price impact of reductions in natural gas demand, and (2) studies that used other energy-economic models to investigate the price impact of substantial change in natural gas demand. While the results vary considerably among the different studies, they generally show a price response similar to or larger than that shown by DOE's NEMS analysis.[14]

NRDC and Dow Chemical argued that this outcome would likely represent a net gain to society since most gas users would be better off, and producers, whose revenues and costs both would fall, would likely be no worse off. (NRDC and Dow, No. 132 at pp. 4–8). In the short run, DOE's preliminary analysis indicates that consumer savings from lower natural gas prices would be offset by declines in gas producer revenue.

In most instances, a reduction in the price of a good would not represent a net economic benefit, but rather a transfer from producers (domestic or foreign) to consumers. In other words, there is a corresponding $1.7 billion *reduction* in revenue to natural gas producers.

However, since natural gas is an exhaustible resource, price effects may be felt differently. There is a literature [15] [16] indicating that, for exhaustible resources, at least some portion of a price reduction reflects the fact that reduced demand effectively increases future supply and as such would represent a net economic or resource benefit, rather than just a transfer between parties. Although, it is uncertain as to the magnitude of price reduction that would not be a transfer benefit.

Based on the discussed analysis, DOE recognizes that there is uncertainty about the magnitude, distribution, and timing of the costs, benefits, and net benefits within the economy. DOE's preliminary analysis indicates that the prices of natural gas to residential consumers would increase slightly. If there is an increase in the prices of natural gas for residential consumers the LCCs will be affected and the LCC savings would be reduced if such price changes were incorporated in the LCC analysis. While DOE has not been able to estimate these potential effects, DOE anticipates the effect will be small since the magnitude of the residential gas price change is small (but likely to vary as the natural gas savings increases).

Similarly, DOE is uncertain of the effects of the drop in natural gas on producers and distributors of natural gas. While their revenues and costs are expected to drop, it is uncertain whether they will drop in proportion over time. The supply side will likely experience revenue loss due to both the price changes and the reduction in gas sales that they will experience.

DOE considered the potential impact on natural gas prices in the establishment of the final standards, but because of the uncertainty of these impacts, and because DOE's analysis has not been subjected to public review, this factor had little impact on DOE's conclusion. The Department did seek to provide an opportunity for public review and comment on this analysis, which if affirmed, would have merited consideration in deciding whether to finalize higher efficiency levels in this rulemaking, but because certain parties opposed DOE's ability to provide opportunity for additional comment and because the U.S. District Court ultimately denied DOE the additional

[11] Wiser, R., M. Bolinger, M. St. Clair. Easing the Natural Gas Crisis: Reducing Natural Gas Prices through Increased Deployment of Renewable Energy and Energy Efficiency. Lawrence Berkley National Laboratory. January 2005. (*http://eetd.lbl.gov/EA/reports/56756.pdf*).

[12] DOE only analyzed the impact of a 90-percent AFUE standard because it anticipates that impacts to natural gas prices would not result from energy savings associated with the efficiency levels considered by DOE, which are below 90-percent AFUE.

[13] The economy-wide savings over 2015–2038 (the period used to estimate the NPV of the national consumer benefits) equals $3.6 billion at a seven-percent discount rate.

[14] The ratio of the percentage change in price to the percentage change in consumption is termed ''inverse price elasticity.'' DOE's analysis using NEMS found an average inverse price elasticity (IPE) over the forecast period of 0.9. Analysis of the results from studies using six other models (as reported by Stanford's Energy Modeling Forum in a 2003 report ''Natural Gas, Fuel Diversity and North American Energy Markets'') found a wide range of inverse price elasticities for change in natural gas consumption. Four of the models show an IPE in the range of 1.1 to 2.1; two others show unusually high values of 6.3 and 7.3. DOE also reviewed studies that used the Energy and Environmental Analysis Corporation's model and found that this model results in higher inverse price elasticity (ranging from 4 to 16) than does NEMS.

[15] Fisher, A., Resource and Environmental Economics. Cambridge University Press. 1981.

[16] Hotelling, H., The economics of exhaustible resources. Journal of Political Economy. Vol. 39, 137–75. 1931.

time that would be required, DOE was unable to do so.

More specifically, this rulemaking is subject to a Consent Decree filed with the U.S. District Court for the Southern District of New York, which settled the consolidated cases of *State of New York, et al.* v. *Bodman, and Natural Resources Defense Council, Inc., et al.*, v. *Bodman (No. 05-Civ.-7807 (JES) and No. 05-Civ.-7808 (JES), respectively (S.D.N.Y consolidated December 6, 2005)*. Under that Consent Decree, DOE was required to publish a final rule for amended energy conservation standards for residential furnaces and boilers by September 30, 2007.

DOE had received comments on the NOPR that indicated the feasibility and desirability of addressing natural gas price impacts as a result of the standards at issue in this rulemaking. DOE wished to consider those impacts prior to promulgating a final rule, and preliminarily believed that, if confirmed, would have merited consideration in evaluating higher efficiency standards for the products covered by this rulemaking, including a 90% AFUE standard for non-weatherized gas furnaces. Therefore, in order to further address the natural gas price analysis and potentially promulgate higher efficiency standard levels, DOE moved the Court to modify the Consent Decree so that the required publication date for the final rule would be extended nine months, which would allow DOE to publish a supplemental notice of proposed rulemaking, consider the additional information, and potentially use it to form the basis for a final rule.

However, certain other parties—specifically, the Gas Appliance Manufactures Association, the Air-Conditioning and Refrigeration Institute, the Association of Home Appliance Manufacturers objected to DOE's motion. The State of New York *et al.* and NRDC *et al.* submitted that DOE did not establish the requisite ''good cause'' for modifying the Consent Decree, but would be willing to stipulate to the DOE's proposed extension, provided that certain conditions are met.

On September 25, 2007, the Court granted a stay of the September 30th deadline to further consider DOE's motion, then on November 1, 2007, the Court denied the motion, thus necessitating DOE's issuance of a final rule by November 8, 2007. As part of its basis for denying the motion, the Court said that the 90-percent AFUE standard for non-weatherized gas furnaces was previously subject to public review. However, nowhere had DOE made available an analysis of the potential impact of such a standard on natural gas prices. As indicated by GAMA, DOE must provide a rationale for the final standard level, and that generally requires that the analysis underlying DOE's determination be subject to review and comment. See, Memorandum Filed in Support of Plaintiff-Intervenors' Opposition to Motion to Modify the Consent Decree, p. 23. Because DOE was denied additional time to promulgate a final rule, DOE was unable to solicit data and comment on its natural gas price analysis, particularly with regard to the uncertainty thereof. Therefore, DOE must issue a final rule by November 8, 2007, as ordered by the Court, based on the record available to DOE at this time.

5. Efficiency Standards for Electric Furnaces

In the October 2006 NOPR, DOE did not propose energy efficiency standards for electric furnaces because DOE found that the resulting energy savings would be de minimis given the high efficiency level of such furnaces. AGA and NPGA objected to DOE's decision not to propose efficiency standards for electric furnaces, stating that these furnaces meet the statutory definition of 'furnaces' under current law. (AGA, No. 103 at p. 3; NPGA, No. 142 at p. 4) AGA disagreed with DOE's finding that energy savings would be de minimis. (AGA, No. 137 at p. 4)

DOE found that the reports of furnace manufacturers to the FTC list the efficiency of the electric furnaces at 100-percent AFUE. 16 CFR Part 305, Appendix G2. As stated in the October 2006 NOPR, DOE did not consider electric furnaces since their efficiency approaches 100-percent AFUE and improvements to them would also offer de minimis energy-savings potential. 71 FR 59214. In addition, commenters did not provide any additional data to substantiate their claims for electric furnaces. Therefore, for electric furnaces, DOE is not adopting standards in today's final rule.

6. Electricity Consumption of Furnace Fans

ACEEE, NEDER, NHOCA, NYSERDA, ODD, and OEP commented that DOE should consider standards concerning the electricity consumption of furnace fans, either in the current rulemaking or in the future. (ACEEE, No. 120 at p. 9; Public Meeting Transcript, No. 107.6 at p. 69; NEDER, No. 123 at pp. 5–6; NHOCA, No. 134 at p. 1; NYSERDA, No. 117 at p. 1; ODD, No. 124 at p. 2; OEP, No. 139 at p. 1) As stated in the October 2006 NOPR, since adding electricity consumption standards to this rulemaking would likely cause further substantial delay in the rulemaking process, DOE accepted the recommendations from GAMA and ASAP and decided not to address furnace electricity consumption in this rulemaking. 71 FR 59209. DOE may consider furnace electricity consumption separately in a subsequent rulemaking.

7. Use of LCC Results in Selecting Standard Levels

ACEEE commented that the average LCC results reported in the October 2006 NOPR show inconsequential differences among ''mainstream'' efficiency options. Therefore, ACEEE stated that, given ''virtually indistinguishable differences in LCC and the fact that all of these options are technically feasible,'' DOE should follow NAECA's dictate to select standards with the maximum savings that are technically feasible and economically justified. (ACEEE, No. 120 at p. 11) As discussed above in section III.D.1.b, the LCC is one factor DOE used in determining whether an energy conservation standard for residential furnaces and boilers is economically justified. In its consideration, DOE took into account the magnitude of differences in average LCC impacts between alternative standards, as well as the percentages of consumers predicted to experience a positive or negative LCC impact.

8. Definition of Trial Standard Levels

NRDC and Dow Chemical commented that DOE should analyze two intermediate levels between 90-percent AFUE and 96-percent AFUE (92-percent AFUE and 94-percent AFUE) for non-weatherized gas furnaces. NRDC stated that DOE has failed to determine whether these two additional levels may be economically justified. (NRDC and Dow Chemical, No. 132 at p. 8; NRDC, No. 131 at p. 10) DOE included the 92-percent AFUE for non-weatherized gas furnaces in most of the rulemaking analyses. DOE did not include this efficiency level in any TSL because it has a lower NPV (at a three-percent discount rate) than the 90-percent-AFUE furnace. DOE did not include 94-percent AFUE for non-weatherized gas furnaces in any TSL because DOE's initial evaluations indicate the costs and benefits of this efficiency level are similar to those of the 96-percent-AFUE level, which DOE has initially determined is the max-tech option.

9. Test Procedure

National Oilheat Research Alliance (NORA) encouraged DOE to more fully

integrate information about energy saving strategies into the DOE test procedure for oil-fired equipment. (Public Meeting Transcript, No. 107.6 at p. 63) While the test procedure for furnaces and boilers is not under revision at this time, DOE acknowledges the comment from NORA and will take it into consideration when DOE revises the test procedure.

10. Structural Costs Associated With Condensing Furnaces

DOE stated in the October 2006 NOPR that it recognizes that some consumers may experience additional costs that exceed those used in DOE's analysis to address necessary structural changes for installing a condensing furnace, primarily for the vent systems associated with non-weatherized gas furnaces and for mobile home gas furnaces at or above 90-percent-AFUE. 71 FR 59218. DOE noted that, for some dwellings, it may be necessary to make ''structural'' changes, such as the removal or penetration of an interior wall, exterior wall, or roof, to accommodate new vent systems (and combustion air intakes). While DOE did not have data to quantify the number of consumers that may be affected in this manner and the cost magnitude, it believes the possible cost impacts may be significant enough to warrant consideration in evaluating the adoption of a standard level that would require condensing technology. Therefore, DOE invited comments on the number of consumers that may be affected by structural changes for installing a condensing furnace and the cost magnitude of any structural changes. 71 FR 59218.

DOE received two opposing comments on this issue. ACEEE commented that it does not believe there are extraordinary costs or structural changes needed for condensing furnaces that DOE did not account for in the Installation Model. (Public Meeting Transcript, No. 107.6 at p. 94) Conversely, Rheem acknowledged that there could be structural changes associated with installing a new vent system in a house, assuming it is physically feasible to do so in the existing house. (Rheem, No. 101 at p. 2; Rheem, No. 138 at p. 4) Specifically, Rheem stated that major building structural changes could be required when changing from a traditional, 80-percent-AFUE, Category I vent, which is a high-temperature and negative-pressure metal B-vent, to a 90-percent-AFUE, Category IV vent, which is a low-temperature, sealed, positive-pressure vent made with polyvinyl chloride (PVC). In many cases, Rheem pointed out that installing a new condensing furnace in retrofit applications may be impossible, which would require the consumer to change to all-electric heating. (Rheem, No. 101 at p. 2; Rheem, No. 138 at p. 4)

DOE did not revise the Installation Model to include costs associated with the structural changes that could be required for installing a condensing furnace in retrofit applications. DOE accounted for many types of installation configurations and the costs associated with each of these in the Installation Model, which it derived with consultations and studies conducted by the Gas Research Institute. See, Appendix C of the TSD.

VI. Analytical Results and Conclusions

A. Trial Standard Levels

Table VI.1 presents the TSLs analyzed for today's final rule and the efficiency levels within each TSL for each class of product. TSL 5 is the max-tech level for each class of product. TSL levels 1, 2, 4, and 5 represent the corresponding TSL levels evaluated in the October 2006 NOPR, but with the revisions to the analysis discussed above. TSL levels A and B are comprised of standard levels presented in the NOPR, but not in the particular grouping as present in TSL A and B. TSL A and B were also evaluated using the updated analysis.

TABLE VI.1.—TRIAL STANDARD LEVELS FOR FURNACES AND BOILERS

Product classes	Trial standard levels (AFUE, %)					
	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
Non-weatherized gas furnaces	80	80	81	90	90	96
Weatherized gas furnaces	80	81	81	81	81	83
Mobile home gas furnaces	80	80	80	90	90	90
Oil-fired furnaces	80	82	82	82	84	85
Gas boilers	82	82	84	82	84	99
Oil-fired boilers	83	83	83	84	84	95

TSL 1 represents the most common product efficiencies of the current market. For example, for non-weatherized gas furnaces, TSL 1 is 80-percent AFUE, which represents the highest number of models listed in the 2005 GAMA directory.

TSL 2 is the set of efficiencies for all product classes that yields the maximum NPV as calculated in the NES analysis, assuming a seven-percent discount rate and only considering non-condensing technologies.

TSL A is comparable to TSL 2 except DOE modified the efficiency levels for non-weatherized gas furnaces and gas boilers. As discussed in section IV.A, DOE determined there are safety concerns related to potential venting failure due to condensation for non-weatherized gas furnaces at 81-percent AFUE and for gas boilers at 84-percent AFUE. Therefore, TSL A includes efficiency levels at which DOE initially determined that there are no safety concerns for these two products (i.e., 80-percent AFUE for non-weatherized gas furnaces and 82-percent AFUE for gas boilers).

TSL 4 consists of efficiency levels that correspond to the maximum efficiency level with a positive NPV as calculated in the NES analysis, assuming a three-percent discount rate.

TSL B is comparable to TSL 4 except DOE modified the efficiency levels for oil-fired furnaces and gas boilers. As discussed in section IV.A, DOE determined there are safety concerns related to potential venting failure due to condensation for oil furnaces at 84-percent AFUE and for gas boilers at 84-percent AFUE. Therefore, TSL B includes lower efficiency levels for these two products where there are no safety concerns (i.e., 82-percent AFUE for oil-fired furnaces and 82-percent AFUE for gas boilers). TSL B also includes the 84-percent AFUE level for oil-fired boilers as found in TSL 4, which is the same AFUE level as included in the Joint Stakeholder Recommendation for boilers discussed in section V.B.1, above.

TSL 5 is the max-tech level. It represents condensing technologies for all classes except weatherized gas-fired

furnaces. For the latter class, other technologies provide the maximum technical efficiency.

As presented in the October 2006 NOPR, the only difference between TSL 3 and 2 was the efficiency levels for non-weatherized gas furnaces and mobile home furnaces, 81-percent AFUE as compared to 80-percent AFUE, respectively. In today's notice of final rulemaking, an 81-percent AFUE for non-weatherized gas furnaces is included in TSL 2. Further, an 81-percent AFUE for mobile home furnaces no longer yields the maximum NPV as calculated in the NES analysis, assuming a seven-percent discount rate. As such, DOE did not evaluate the proposed standard TSL 3 in this notice, as it would have been redundant for non-weatherized gas furnaces and inappropriate for mobile home furnaces.

B. Significance of Energy Savings

To estimate the energy savings through 2038 that would result from new standards, DOE compared the energy consumption of residential furnaces and boilers under the base case (no new standards) to the energy consumption of these products under amended standards. Table VI.2 shows DOE's NES estimates for each TSL. DOE reports both undiscounted and discounted values of energy savings. Discounted energy savings represent a policy perspective wherein energy savings farther in the future are less significant than energy savings closer to the present.

TABLE VI.2.—SUMMARY OF CUMULATIVE NATIONAL ENERGY SAVINGS FOR RESIDENTIAL FURNACES AND BOILERS

[Energy savings for units sold from 2015 to 2038]

Trial standard level	National energy savings (quads)		
	Not discounted	3% discounted	7% discounted
1	0.20	0.10	0.04
A	0.25	0.13	0.06
2	0.69	0.35	0.15
B	3.21	1.62	0.70
4	3.34	1.68	0.73
5	6.76	3.41	1.47

C. Economic Justification

1. Economic Impact on Consumers

a. Life-Cycle Costs and Payback Period

Consumers will be affected by the standards in that they will experience higher purchase prices and lower operating costs. Generally, these impacts are best captured by changes in LCC and by the PBP. Therefore, DOE calculated the LCC and PBP for the standard levels considered in this rulemaking. DOE's LCC and PBP analyses provided six key outputs for each TSL, which are reported in Tables VI.3 through VI.8 below. The first two outputs are the LCC and the average net life-cycle savings for a design that complies with each TSL, and the next three outputs are the proportion of purchases where the purchase of a complying unit would create a net life-cycle cost, no impact, or net life-cycle savings for the consumer.

The final output is the average PBP for the consumer purchase of a design that complies with the TSL. The PBP is the number of years it would take for the consumer to recover, as a result of energy savings, the increased costs of higher-efficiency equipment, based on the operating cost savings from the first year of ownership. The PBP is an economic benefit-cost measure that uses benefits and costs without discounting. DOE's PBP analysis and its analysis under the rebuttable-presumption test both concern the payback period for a standard. However, DOE based the PBP analysis for residential furnaces and boilers on energy consumption under conditions of actual use of each product by consumers, whereas, as required by EPCA, it based the rebuttable presumption test on consumption as determined under conditions prescribed by the DOE test procedure. As indicated previously, while DOE examined the rebuttable-presumption criteria, it evaluated whether the standard levels in today's notice are economically justified through a more detailed analysis of the economic impacts of increased efficiency as directed under section 325(o)(2)(B)(i) of EPCA. (42 U.S.C. 6295(o)(2)(B)(i)) Detailed information on the LCC and PBP analyses can be found in TSD Chapter 8.

TABLE VI.3.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR NON-WEATHERIZED GAS FURNACES

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	78	13,016	.....	.....	.....	.....	.....
1	80	12,804	2	0	99	1	1.7
A	80	12,804	2	0	99	1	1.7
2	81	12,771	15	29	36	35	22
B	90	12,617	55	37	36	27	20
4	90	12,617	55	37	36	27	20
5	96	13,547	(865)	89	2	9	76

TABLE VI.4.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR WEATHERIZED GAS FURNACES

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	78	10,491	.....	.....	.....	.....	.....
1	80	10,383	19	0	82	18	1.6
A	81	10,337	62	3	7	91	3.4
2	81	10,337	62	3	7	91	3.4
B	81	10,337	62	3	7	91	3.4
4	81	10,337	62	3	7	91	3.4
5	83	10,419	(20)	71	0	29	20

TABLE VI.5.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR MOBILE HOME GAS FURNACES

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	75	11,271	.....	.....	.....	.....	.....
1	80	10,529	111	1	85	14	3.7
A	80	10,529	111	1	85	14	3.7
2	80	10,529	111	1	85	14	3.7
B	90	10,187	434	30	5	65	18
4	90	10,187	434	30	5	65	18
5	90	10,187	434	30	5	65	18

TABLE VI.6.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR OIL-FIRED FURNACES

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	78	16,248	.....	.....	.....	.....	.....
1	80	15,971	10	0	96	4	0.3
A	82	15,716	177	0	30	70	0.7
2	82	15,716	177	0	30	70	0.7
B	82	15,716	177	0	30	70	0.7
4	84	15,815	96	38	15	47	14
5	85	15,876	40	51	7	42	16

TABLE VI.7.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR GAS BOILERS

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	80	20,472	.....	.....	.....	.....	.....
1	82	19,898	208	11	44	46	12
A	82	19,898	208	11	44	46	12
2	82	19,898	208	11	44	46	12
B	82	19,898	208	11	44	46	12
4	84	19,802	300	18	15	67	12
5	99	21,042	(881)	75	3	22	35

TABLE VI.8.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR OIL-FIRED BOILERS

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
	80	24,594	.....	.....	.....	.....	.....
1	83	23,952	69	0	84	16	0.9

TABLE VI.8.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR OIL-FIRED BOILERS—Continued

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	Years
		2006$	2006$	%	%	%	
A	83	23,952	69	0	84	16	0.9
2	83	23,952	69	0	84	16	0.9
B	84	23,987	56	17	61	22	19
4	84	23,987	56	17	61	22	19
5	95	24,551	(456)	72	0	28	27

b. Consumer Subgroup Analysis

DOE estimated consumer subgroup impacts by analyzing the potential effects of standards for non-weatherized gas furnaces on low-income households, households occupied only by seniors, and southern and northern households. DOE defined northern households as those in States with average HDD over 6,000, and it defined southern households as those in States with average HDD below 5,000.

DOE's analysis indicates that today's standard for non-weatherized gas furnaces would have an impact on low-income households and senior-only households that would be similar to its impact on all households.

Tables VI.9 and VI.10 show for each TSL the summary of LCC and PBP results for northern and southern households. Today's standard for non-weatherized gas furnaces (80 percent AFUE) would result in similar LCC savings in northern and southern households, with a shorter PBP for northern households.

TABLE VI.9.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR NON-WEATHERIZED GAS FURNACES IN NORTHERN HOUSEHOLDS

[>6000 HDD]

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	years
		2006$	2006$	%	%	%	
	78	15,492	.....	.....	.....	.....	.....
1	80	15,222	3	0	98	2	0.7
A	80	15,222	3	0	98	2	0.7
2	81	15,161	32	47	47	34	14
B	90	14,779	212	22	47	31	13
4	90	14,779	212	22	47	31	13
5	96	15,582	(598)	84	2.4	13	61

TABLE VI.10.—SUMMARY OF LCC AND PAYBACK PERIOD RESULTS FOR NON-WEATHERIZED GAS FURNACES IN SOUTHERN HOUSEHOLDS

[<5000 HDD]

Trial standard level	Efficiency level (AFUE) (percent)	LCC					Payback period
		LCC	LCC savings	Net cost	No impact	Net benefit	years
		2006$	2006$	%	%	%	
	78	10,439	.....	.....	.....	.....	.....
1	80	10,285	2	0	98	2	2.2
A	80	10,285	2	0	98	2	2.2
2	81	10,280	1	40	23	37	29
B	90	10,345	(82)	55	21	23	26
4	90	10,345	(82)	55	21	23	26
5	96	11,389	(1,108)	92	1.4	7	101

Chapter 11 of the TSD explains DOE's method for conducting the consumer subgroup analysis and presents the detailed results of that analysis.

2. Economic Impact on Manufacturers

DOE determined the economic impacts on manufacturers of more stringent standards for residential furnaces and boilers, as described in the October 2006 NOPR. 71 FR 59212, 59228–59232, 59240–59245. The only modifications DOE made to the MIA for this final rule were the inclusion of the revised manufacturing costs from the engineering analysis, the conversion of the capital and product conversion cost to 2006$, and the revised shipments from the NES analysis. DOE fully describes this analysis in Chapter 12 of the final rule TSD.

a. Industry Cash-Flow Analysis Results

Using four different markup scenarios and two shipments forecasts, 71 FR 59230–59232, 59240, DOE estimated the impact of amended standards for

residential furnaces and boilers on the INPV of the furnace and boiler industry. The impact of new standards on INPV consists of the difference between the INPV in the base case (no new standards) and the INPV in the standards case (with amended standards). INPV is the primary metric used in the MIA, and provides one measure of the fair value of the industry in today's dollars. DOE calculated the INPV by summing all of the net cash flows, discounted at the industry's cost of capital, or discount rate.

Tables VI.11 through VI.16 show the estimated changes in INPV that would result from the TSLs DOE considered in this rulemaking, using both the shipments estimates calculated in the NES analysis, and the shipments data that manufacturers provided. Each table shows the changes attributable to one of the product classes DOE evaluated. The figures in these tables reflect and are affected by the product conversion expenses and capital investments that the industry would incur at each TSL, but the tables do not display these expenses and investments.

TABLE VI.11.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR NON-WEATHERIZED GAS FURNACES

[2006$]

TSL	NES shipments					
	Flat markup			Two-tier markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	1,197			1,161		
1	1,197	0	0	1,162	1	0
A	1,197	0	0	1,162	1	0
2	1,125	(72)	−6	1,084	(78)	−7
B	1,217	20	2	881	(280)	−24
4	1,217	20	2	881	(280)	−24
5	1,505	307	26	937	(224)	−19
	Manufacturers' shipments					
Base case	1,227			1,235		
1	1,227	0	0	1,235	0	0
A	1,227	0	0	1,235	0	0
2	1,152	(74)	−6	1,155	(79)	−6
B	1,110	(117)	−10	839	(396)	−32
4	1,110	(117)	−10	839	(396)	−32
5	902	(324)	−26	595	(640)	−52

TABLE VI.12.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR WEATHERIZED GAS FURNACES

[2006$]

TSL	NES shipments					
	Flat markup			Constant price markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	272			272		
1	239	(32)	−12	235	(37)	−14
A	232	(40)	−15	218	(54)	−20
2	232	(40)	−15	218	(54)	−20
B	232	(40)	−15	218	(54)	−20
4	232	(40)	−15	218	(54)	−20
5	223	(48)	−18	181	(91)	−33

TABLE VI.13.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR MOBILE HOME GAS FURNACES

[2006$]

TSL	Flat markup					
	NES shipments			Manufacturers' shipments		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	23			23		
1	23	0	0	23	0	0
A	23	0	0	23	0	0
2	23	0	0	23	0	0

TABLE VI.13.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR MOBILE HOME GAS FURNACES—Continued

[2006$]

TSL	Flat markup					
	NES shipments			Manufacturers' shipments		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
B	11	(11)	−50	11	(13)	−56
4	11	(11)	−50	11	(13)	−56
5	11	(11)	−50	11	(13)	−56

TABLE VI.14.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR OIL-FIRED FURNACES

[2006$]

TSL	NES Shipments					
	Flat markup			Constant price markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	36			36		
1	35	(2)	–5	35	(2)	–5
A	33	(4)	–10	31	(5)	–14
2	33	(4)	–10	31	(5)	–14
B	33	(4)	–10	31	(5)	–14
4	29	(8)	–21	25	(12)	–32
5	28	(8)	–23	22	(15)	–40

TABLE VI.15.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR GAS BOILERS

[2006$]

TSL	Manufacturers' Shipments					
	Flat markup			Three-tier markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	201			201		
1	200	(1)	–1	196	(5)	–3
A	200	(1)	–1	196	(5)	–3
2	184	(17)	–8	174	(27)	–13
B	200	(1)	–1	196	(5)	–3
4	184	(17)	–8	174	(27)	–13
5	171	(30)	–15	100	(101)	–50

TABLE VI.16.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR OIL-FIRED BOILERS

[2006$]

TSL	Manufacturers' Shipments					
	Flat markup			Three-tier markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
Base case	78			78		
1	74	(4)	–5	63	(14)	–18
A	74	(4)	–5	63	(14)	–18
2	74	(4)	–5	63	(14)	–18
B	74	(4)	–5	62	(15)	–20
4	74	(4)	–5	62	(15)	–20

TABLE VI.16.—CHANGES IN INDUSTRY NET PRESENT VALUE FOR OIL-FIRED BOILERS—Continued

[2006$]

TSL	Manufacturers' Shipments					
	Flat markup			Three-tier markup		
	INPV $MM	Change in INPV from base		INPV $MM	Change in INPV from base	
		$MM	% change		$MM	% change
5	59	(18)	–23	32	(45)	–58

The October 2006 NOPR provides a detailed discussion of the estimated impact of amended furnace and boiler standards on INPV for each product class. 71 FR 59240–59244.

b. Impacts on Manufacturing Capacity and Subgroups of Manufacturers

As discussed in the October 2006 NOPR, to the extent that more stringent energy conservation standards increase the size of the heat exchanger, they could reduce plant throughput, particularly for those plants that are limited in available space used for fabricating heat exchangers. The standards, thus, could necessitate that manufacturers add floor space to their existing plants and warehouses. In addition, assembly and fabrication times could increase for the larger equipment. In an attempt to recoup capacity, manufacturers might need to invest in productivity, or equipment, or consider outsourcing some heat exchanger production. 71 FR 59244.

It is not clear that all new capacity would be added in the United States. During the MIA interviews, several manufacturers stated that there has been a trend in the industry to move production facilities to overseas locations where labor markets offer cost savings. Some of these companies commented that new standards could speed up this trend. However, DOE does not expect the standards being adopted in today's final rule to significantly reduce plant throughput.

As discussed in the October 2006 NOPR, using average cost assumptions to develop an industry-cash-flow estimate is not adequate for assessing differential impacts among subgroups of manufacturers. 71 FR 59244. Small manufacturers, niche players, or manufacturers exhibiting a cost structure that differs largely from the industry average could be affected differently. DOE used the results of the industry characterization to group manufacturers exhibiting similar characteristics. As discussed in the October 2006 NOPR, DOE expects the standard levels being adopted in today's final rule to have a relatively minor differential impact on small manufacturers of residential furnaces and boilers. 71 FR 59244.

c. Cumulative Regulatory Burden

As discussed in the October 2006 NOPR, one aspect of the assessment of manufacturer burden is the cumulative impact of multiple DOE standards and other regulatory actions that affect the manufacture of the same covered products. 71 FR 59244–59245. Manufacturers of residential furnaces and boilers also manufacture approximately 82 percent of the residential central air conditioners and heat pumps. New, higher Federal efficiency standards became applicable to residential central air conditioners manufactured after January 23, 2006, and new, higher Federal standards will apply to commercial air conditioning equipment manufactured after January 1, 2010. In addition, the EPA has mandated the phaseout, by January 1, 2010, of certain refrigerants used in these products. The furnace and boiler manufacturers who also produce residential and commercial air conditioning products have been and will be devoting substantial resources to complying with these requirements. Manufacturers have been working to redesign all of the product lines and have allocated most of their capital resources for redesigning and retooling their production lines to meet the new minimum efficiency standards. Manufacturers are also now re-designing their product offerings and will need to retool to meet the EPA standards. Chapter 12 of the final rule TSD addresses in greater detail the issue of cumulative regulatory burden.

3. National Net Present Value and Net National Employment

The NPV analysis estimates the cumulative benefits or costs to the Nation that would result from particular standard levels. While the NES analysis estimates the energy savings from a proposed energy efficiency standard, the NPV analysis provides estimates of the national economic impacts of a proposed standard relative to a base case of no new standard. Table VI.17 provides an overview of the NPV results, using both a seven-percent and a three-percent real discount rate. See TSD Chapter 10 for more detailed NPV results.

TABLE VI.17.—SUMMARY OF CUMULATIVE NET PRESENT VALUE FOR RESIDENTIAL FURNACES AND BOILERS

[Impacts for units sold from 2015 to 2038]

Trial standard level	NPV (billion 2006$)	
	7% discount rate	3% discount rate
1	0.51	1.69
A	0.69	2.18
2	0.89	4.02
B	0.98	11.07
4	0.98	11.53
5	−21.38	−26.03

DOE also estimated the national employment impacts due to each of the TSLs. As discussed in the October 2006 NOPR, 71 FR 59232–59233, 59247, DOE expects the net monetary savings from standards to be redirected to other forms of economic activity. As shown in Table VI.18, DOE estimates net indirect employment impacts—changes in employment in the larger economy (other than in the manufacturing sector being regulated)—from furnace and boiler energy efficiency standards to be positive but relatively small. Although DOE's analysis suggests that today's furnace and boiler standards would result in a very small increase in the net demand for labor in the economy, relative to total national employment, this increase would be sufficient to offset fully any adverse impacts on employment that might occur in the furnace and boiler industry. For details on the employment impact analysis methods and results, see TSD Chapter 14.

TABLE VI.18.—NET NATIONAL CHANGE IN INDIRECT EMPLOYMENT

[Thousands of jobs in 2038]

Trial Standard Level (Thousands of Jobs)					
TSL1	TSLA	TSL2	TSLB	TSL4	TSL5
0.74	0.94	2.55	11.71	12.96	26.07

4. Impact on Utility or Performance of Equipment

As indicated in section V.B.4 of the October 2006 NOPR, DOE believes that the new standards it is adopting today will not lessen the utility or performance of any residential furnaces and boilers. 71 FR 59247.

5. Impact of Any Lessening of Competition

As previously discussed in the October 2006 NOPR, 71 FR 59213, 59247, and in section II.F.1.e of this preamble, DOE considers any lessening of competition that is likely to result from standards and the Attorney General determines the impact, if any, of any such lessening of competition. To assist the Attorney General in making such a determination, DOE provided DOJ with copies of the October 2006 proposed rule and the NOPR TSD for review.

In comment on the October 2006 proposed rule, DOJ expressed concern that the proposed standards for weatherized gas furnaces at 83 percent AFUE and gas boilers at 84 percent AFUE could adversely affect competition, and that manufacturers would have difficulty designing products that safely meet the proposed standards. (DOJ at No. 144, p. 2) DOJ noted that, for weatherized gas furnaces, meeting the standard would likely result in increased condensation, potentially resulting in significant deterioration that would jeopardize the safety of the product, and, for gas-fired water boilers, meeting the standard would make effective CO_2 venting more difficult. DOJ further noted that any resulting costs incurred to solve these issues could adversely affect the competitiveness of these products in relation to electric heat pumps and water heaters. DOJ urged DOE to carefully consider its proposed standards in light of these concerns.

As described in section V.D of this preamble, DOE is adopting lower efficiency levels for the standards for weatherized gas furnaces and gas boilers than the levels proposed in the October 2006 proposed rule. DOE expects that the lower efficiency levels avoid the problems that DOJ mentioned for weatherized gas furnaces and gas boilers. Manufacturers would not incur costs to solve these issues and, therefore, the standards established in today's rule would not adversely affect the competitiveness of these products in relation to electric heat pumps and water heaters.

6. Need of the Nation To Conserve Energy

The Secretary recognizes the need of the Nation to save energy. Enhanced energy efficiency, where economically justified, improves the Nation's energy security, strengthens the economy, and reduces the environmental impacts or costs of energy production. The energy savings from residential furnace and boiler standards is projected to result in (1) reduced power sector emissions of CO_2, (2) either reduced power sector emissions of NO_X or an economic benefit in the form of emission allowance credits for this pollutant, and (3) reduced household emissions (i.e., emissions at the sites where appliances are used) of CO_2, NO_X, and SO_2. DOE expects the standards to have negligible impact on electricity generating capacity.

Table VI.19 provides DOE's estimate of the emissions reductions projected to result from adoption of the TSLs considered in this rulemaking.

TABLE VI.19.—SUMMARY OF EMISSIONS REDUCTIONS FOR RESIDENTIAL FURNACES AND BOILERS

[Cumulative reductions for units sold from 2015 to 2038]

Emission	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
CO_2 (Mt)	−6.1	−7.8	−20.0	−137.1	−141.3	−322.0
NO_X (kt)	−7.3	−9.2	−23.9	−164.6	−169.2	−373.1
SO_2 (kt)	0.0	−1.8	−2.0	−6.2	−10.5	−63.9

DOE also calculated discounted values for future emissions, using the same seven-percent and three-percent real discount rates that it used in calculating the NPV. Table VI .20 shows the discounted cumulative emissions impacts for residential furnaces and boilers.

TABLE VI.20.—SUMMARY OF DISCOUNTED EMISSIONS REDUCTIONS FOR RESIDENTIAL FURNACES AND BOILERS

[Cumulative reductions for units sold from 2015 to 2038]

Emission	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
7% Discount Rate						
CO_2 (Mt)	−1.6	−2.1	−5.3	−36.2	−37.3	−83.9
NO_X (kt)	−1.7	−2.1	−5.4	−37.3	−38.3	−84.4
SO_2 (kt)	0.0	−0.4	−0.5	−1.4	−2.4	−14.7

TABLE VI.20.—SUMMARY OF DISCOUNTED EMISSIONS REDUCTIONS FOR RESIDENTIAL FURNACES AND BOILERS—Continued

[Cumulative reductions for units sold from 2015 to 2038]

Emission	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
3% Discount Rate						
CO_2 (Mt)	−3.4	−4.3	−10.9	−74.8	−77.1	−174.9
NO_X (kt)	−3.8	−4.7	−12.3	−84.5	−86.9	−191.5
SO_2 (kt)	0.0	−0.9	−1.0	−3.2	−5.4	−33.0

For further details on the environmental impacts of today's standards, see the ''Environmental Assessment for Proposed Energy Conservation Standards for Residential Furnaces and Boilers,'' a separate report in the TSD for today's rule.

7. Other Factors

EPCA provides that, in deciding whether a standard is economically justified, DOE must, after receiving comments on the proposed standard, determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, other factors the Secretary considers relevant. (42 U.S.C. 6295(o)(2)(B)(i)) In developing today's standard, the Secretary took into consideration safety concerns related to carbon monoxide exposure resulting from potential failures of venting systems (and heat exchangers), stemming from extraneous condensate production in furnaces and boilers.

D. Conclusion

EPCA contains criteria for DOE to consider in prescribing new or amended energy conservation standards. It states that any such standard for any type (or class) of covered product must 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)) As stated above, in determining whether a standard is economically justified, the Secretary must determine whether the benefits of the standards exceed its burdens considering:

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

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

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

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

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

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

(7) Other factors the Secretary considers relevant.

(42 U.S.C. 6295(o)(2)(B)(i)) A determination of whether a standard level is economically justified is not made based on any one of these factors in isolation. The Secretary must weigh each of these seven factors in total in determining whether a standard is economically justified. Further, the Secretary may not establish an amended standard if such standard would not result in ''significant conservation of energy,'' or ''is not technologically feasible or economically justified.'' (42 U.S.C. 6295(o)(3)(B))

In selecting energy conservation standards for residential furnaces and boilers for consideration in the October 2006 proposed rule as well as this final rule, DOE started by examining the maximum technologically feasible levels, and determined whether those levels were economically justified. Upon finding the maximum technologically feasible levels not to be justified, DOE analyzed the next lower TSL to determine whether that level was economically justified. DOE repeated this procedure until it identified a TSL that was economically justified.

Table VI.21 summarizes DOE's quantitative analysis results for all of the TSLs it considered. This table presents the results or, in some cases, a range of results, for each TSL, and will aid the reader in the discussion of costs and benefits of each TSL. The range of values reported in this table for industry impacts represents the results for the different markup scenarios and shipments forecasts that DOE used to estimate manufacturer impacts.

TABLE VI.21.—SUMMARY OF RESULTS

	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
Primary energy saved (quads)	0.20	0.25	0.69	3.21	3.34	6.76
7% Discount rate	0.04	0.06	0.15	0.70	0.73	1.47
3% Discount rate	0.10	0.13	0.35	1.62	1.68	3.41
Generation capacity change (GW)**	0.4	0.5	1.2	8.2	8.4	17.8
NPV (2006$billion):						
7% Discount rate	0.51	0.69	0.89	0.98	0.98	−21.38
3% Discount rate	1.69	2.18	4.02	11.07	11.53	−26.03
Industry impacts:						
Industry NPV (2006$million)	−38 to −58	−48 to −74	−136 to −179.	−39 to −483	−59 to −519	192 to −904
Industry NPV (% Change)	−2 to −3	−3 to −4	−8 to −10	−2 to −26	−3 to −28	11 to −49
Cumulative emissions impacts:***						
CO_2 (Mt)	−6.1	−7.8	−20.0	−137.1	−141.3	−322.0
NO_X (kt)	−7.3	−9.2	−23.9	−164.6	−169.2	−373.1

TABLE VI.21.—SUMMARY OF RESULTS—Continued

	TSL 1	TSL A	TSL 2	TSL B	TSL 4	TSL 5
SO_2 (kt)	0.0	−1.8	−2.0	−6.2	−10.5	−63.9
Mean life-cycle cost savings (2006$):						
Non-Weatherized Gas Furnaces	$2	$2	$15	$55	$55	($865)
Weatherized Gas Furnaces	$19	$62	$62	$62	$62	($20)
Oil-Fired Furnaces	$10	$177	$177	$177	$96	$40
Gas Boilers	$208	$208	$208	$208	$300	($881)
Oil-Fired Boilers	$69	$69	$69	$56	$56	($456)
Mobile Home Gas Furnaces	$111	$111	$111	$434	$434	$434
Mean Payback Period (years):						
Non-Weatherized Gas Furnaces	1.7	1.7	22	20	20	76
Weatherized Gas Furnaces	1.6	3.4	3.4	3.4	3.4	20
Oil-Fired Furnaces	0.3	0.7	0.7	0.7	14	16
Gas Boilers	12	12	12	12	12	35
Oil-Fired Boilers	0.9	0.9	0.9	19	19	27
Mobile Home Gas Furnaces	3.7	3.7	3.7	18	18	18

* Parentheses indicate negative (−) values.
** Change in installed generation capacity by the year 2038 based on *AEO2007* Reference Case.
*** CO_2 emissions impacts include physical reductions at power plants and households. NO_X emissions impacts include physical reductions at power plants and households as well as production of emissions allowance credits where NO_X emissions are subject to emissions caps. SO_2 emissions impacts include physical reductions at households only.

In addition to the quantitative results, DOE also considered other burdens and benefits that affect economic justification. DOE took into consideration safety concerns arising from the potential failure of venting systems or heat exchangers used for residential furnaces and boilers. These concerns affect non-weatherized gas furnaces at 81 percent, weatherized gas furnaces at 83 percent and 82 percent, oil furnaces at 84 percent, and gas boilers at 84 percent AFUE. See section IV.A of this preamble and final rule TSD Chapter 6 for further discussion.

First, DOE considered TSL 5, the maximum technologically feasible level, for each product class. TSL 5 would likely save 6.76 quads of energy through 2038, an amount DOE considers significant. Discounted at seven percent, the energy savings through 2038 would be 1.47 quads. For the Nation as a whole, TSL 5 would result in a net cost of $21.4 billion in NPV, discounted at seven percent. Although DOE did not quantify the potential benefits from reductions in natural gas prices as a result of TSL 5, DOE has determined that the overall impact on the economy would still be overwhelmingly negative because the decline in NPV at TSL 5 is very large. The emissions reductions are projected at 322 Mt of CO_2,[17] 373 kt of NO_X, and 64 kt of SO_2. Total generating capacity in 2030 is estimated to increase 17.8 gigawatts (GW) under TSL 5, due to projected switching from gas furnaces to electric heating equipment.

At TSL 5, the average consumer is projected to experience a significant increase in LCC for most product classes. Purchasers of non-weatherized gas furnaces are projected to lose on average $865 over the life of the product in present value terms and purchasers of gas-fired boilers would lose on average $881 in present value terms.[18] The LCC savings are estimated to be negative for 89 percent of households in the Nation that purchase non-weatherized gas furnaces, and for 92 percent of all non-weatherized gas furnace consumers in the southern region. The mean payback period of all product classes, except for oil-fired gas furnaces, is estimated to be substantially longer than the mean lifetime.

The projected change in industry value (INPV) ranges from an increase of $192 million to a decrease of $904 million. The magnitude of the impacts is largely determined by the cashflow results for non-weatherized gas furnaces. For this product class, the impacts are driven primarily by the assumptions regarding future product shipments and the ability of manufacturers to offer differentiated products that command a premium markup. DOE recognizes the significant difference between the shipments forecasted by the NES analysis and those anticipated by manufacturers. DOE is concerned about the projected increase in total installed cost of $1,859, or 82 percent, for non-weatherized gas furnaces. With an increase of this size, there is a significant risk of consumers switching to other heating systems, including heat pumps and electric resistance heating. DOE also recognizes that maintaining a full product line is more difficult for manufacturers at higher standard levels. Therefore, DOE places more weight on the two-tiered markup scenario for non-weatherized gas furnaces at TSL 5. In particular, if the high range of impacts is reached as DOE expects, TSL 5 could result in a net loss of $640 million to the non-weatherized gas furnace industry.

After carefully considering the analysis, comments on the proposed rule, and weighing the benefits and burdens, the Secretary reached a similar conclusion as set forth in the NOPR: At TSL 5 the benefits of energy savings and emissions reduction are expected to be outweighed by the potential multi-billion dollar negative net economic cost to the Nation, the economic burden on consumers, and the large capital-conversion costs that could result in a reduction in INPV for manufacturers. Consequently, the Secretary has concluded that TSL 5, the maximum technologically feasible level, is not economically justified.

Next, DOE considered TSL 4. Primary energy savings is estimated at 3.34 quads of energy through 2038, which DOE considers significant. Discounted at seven percent, the energy savings through 2038 would be 0.73 quads. For the Nation as a whole, TSL 4 is projected to result in net savings of $0.98 billion in NPV, discounted at seven percent. The emissions reductions

[17] For all of the TSLs, CO_2 emissions impacts include physical reductions at power plants and households. NO_X emissions impacts include physical reductions at power plants and households as well as production of emissions allowance credits where NO_X emissions are subject to emissions caps. SO_2 emissions impacts include physical reductions at households only.

[18] Non-weatherized gas furnaces are the most prominent class of residential furnaces and boilers, accounting for approximately 72 percent of the total industry sales and approximately 81 percent of residential furnace sales. Gas-fired boilers are the most prominent class of residential boilers, accounting for 6 percent of the total industry sales and 61 percent of residential boiler sales.

are projected to be 141 Mt of CO_2, 169 kt of NO_X, and 10.5 kt of SO_2. Total generating capacity in 2030 under TSL 4 is estimated to increase by 8.4 GW due to the projected switching from gas furnaces to electric heating equipment.

At TSL 4, consumers are projected to experience a decrease in LCC for all of the product classes. Purchasers of non-weatherized gas furnaces are projected to save, on average, $55 over the life of the product in present value terms, and purchasers of gas-fired boilers are projected to save, on average, $300 over the life of the boiler in present value terms. DOE found that 37 percent of households with non-weatherized gas furnaces would be expected to experience a net cost, and 27 percent of households with non-weatherized gas furnaces would be expected to experience a net gain.

TSL 4 requires the use of condensing technology for non-weatherized gas furnaces. A majority of the affected consumers in the south would be expected to experience a significant increase in total installed cost. Since the operating cost savings of condensing technology are less of a factor in warmer climates, the substantial increase in total installed cost leads to increased life-cycle costs. DOE found that 55 percent of households in the south purchasing a non-weatherized gas furnace would experience a life-cycle net cost. The average LCC increase to the southern consumer purchasing a non-weatherized gas furnace is $82. The mean payback period of non-weatherized gas furnaces in the south would be substantially longer than the mean lifetime of these furnaces.

At TSL 4, the projected change in INPV ranges from a loss of $59 million to a loss of $519 million, which could potentially cause up to a 42 percent drop in total industry value. The magnitude of projected impacts is still largely determined by the cashflow results for the non-weatherized gas furnaces. For this product class, the projected impacts continue to be driven primarily by the assumptions regarding future product shipments and the ability to offer differentiated products. Although the projected impacts will not be as severe as expected for TSL 5 for the non-weatherized gas furnace industry, the magnitude of the projected impacts would still be determined primarily by the assumptions regarding future product shipments and the ability to offer differentiated products that command a premium markup. Although the range of possible impacts is not as large as for TSL 5, DOE still recognizes the significant differences between the shipments forecast by the NES analysis and those anticipated by manufacturers. DOE believes that with an increase in total installed cost of $701 for non-weatherized gas furnaces, or 31 percent, some consumers are likely to switch to other heating systems, including heat pumps and electric resistance heating. The low-end estimate of losses in INPV is based on DOE's estimate of the fuel switching that is most likely to occur, while the high end estimate of losses is based largely on manufacturer estimates of fuel switching. Additionally, some product classes would likely require large product-conversion costs because the products would require new heat-exchanger designs to meet the efficiency requirements prescribed in TSL 4. Even though the ability of manufacturers to differentiate products is greater at TSL 4 than at TSL 5, it will still be harder for manufacturers to differentiate products because all of the products offered in TSL 4 for non-weatherized gas furnaces use condensing technology. In particular, if the high range of impacts is reached, TSL 4 could result in a net loss of $396 million to the non-weatherized gas furnace industry.

After carefully considering the results of the analysis, comments on the proposed rule, and the benefits versus burdens, the Secretary reached a similar conclusion as set forth in the NOPR: At TSL 4, the benefits of energy and cost savings and emissions impacts would be outweighed by the economic burden on southern households and the capital conversion costs that are likely to result in a significant reduction in INPV for manufacturers. In addition, DOE determined that there are safety concerns related to potential venting failure due to condensation with oil-fired furnaces at 84 percent AFUE and with gas boilers at 84 percent AFUE. DOE received numerous comments reaffirming these safety concerns, and the Secretary has concluded upon consideration of the factors to determine whether a standard is economically justified that TSL 4 is not economically justified and contains two efficiency levels that could pose a safety or health risk to consumers.

Next, DOE considered TSL B. TSL B is the same as TSL 4 except for oil-fired furnaces and gas boilers, for which there are safety concerns as described above. Therefore, for these two products TSL B includes lower efficiency levels at which these safety concerns are not present (i.e., 82 percent AFUE for oil furnaces and 82 percent for gas boilers).

TSL B is projected to save 3.21 quads of energy through 2038, an amount DOE considers significant. Discounted at seven percent, the projected energy savings through 2038 would be 0.70 quads. For the Nation as a whole, TSL B would result in net savings in NPV of $0.98 billion, discounted at seven percent. The emissions reductions are projected at 137 Mt of CO_2, 165 kt of NO_X, and 6.2 kt of SO_2. Total generating capacity in 2030 under TSL B is projected to increase by 8.2 GW due to the projected switching from gas furnaces to electric heating equipment.

At TSL B, DOE estimates that purchasers of non-weatherized gas furnaces would save, on average, $55 over the life of the product and purchasers of gas-fired boilers would save, on average, $208. As with TSL 4, DOE estimates that 37 percent of households with non-weatherized gas furnaces would experience a net cost, and 27 percent of households with non-weatherized gas furnaces would experience a net gain, with the remaining 36 percent being unaffected. DOE estimated that 55 percent of households in the south with a non-weatherized gas furnace would experience a net life-cycle cost. The estimated average LCC increase to the southern consumer purchasing a non-weatherized gas furnace is $82. The mean payback period of non-weatherized gas furnaces in the south is projected to be substantially longer than the mean lifetime of these furnaces.

The projected change in INPV ranges between a loss of $39 million and a loss of $483 million. Just as with TSL 4, the projected impacts continue to be driven primarily by the assumptions regarding future product shipments and the ability to offer differentiated products. More specifically, most of these differences are attributable to the significant differences between the shipments forecast by the NES analysis and those anticipated by manufacturers. Furthermore, some manufacturers stated they would likely use a de-rating strategy to reduce the increased capital costs associated with TSL B. If manufacturers use such a strategy, it is anticipated that the variety of products offered by the manufacturers would be reduced by eliminating some of the higher-capacity models to reduce the negative impacts. At TSL B, consumers would experience an average increase in total installed cost of $700 for non-weatherized gas furnaces (compared to an 80-percent AFUE furnace). There is a potential risk at this level of consumers switching to electric heating systems, as further detailed in the shipments forecast discussion in Chapter 12 of the TSD. For the furnace industry alone, the industry value would decrease from 2.1 percent to 26.2 percent.

After carefully considering the analysis, comments on the October 2006 proposed rule, and the benefits versus burdens, the Secretary concludes after weighing the statutory criteria in total that TSL B would not be economically justifiable. In particular, the benefits of energy and cost savings and emissions impacts are likely to be outweighed by the economic burden on southern households and the capital conversion costs that are likely to result in a significant reduction in INPV for manufacturers.

Next, DOE considered TSL 2. Primary energy savings at this level would likely be 0.69 quad of energy through 2038, which DOE considers significant. Discounted at seven percent, the energy savings through 2038 is projected to be 0.15 quads. For the Nation as a whole, TSL 2 is projected to result in a net savings of $0.89 billion in NPV, discounted at seven percent. The emissions reductions are projected at 20 Mt of CO_2, 24 kt of NO_X, and 2 kt of SO_2. Total generating capacity in 2030 under TSL 2 would likely increase by 1.2 GW due to the projected switching from gas furnaces to electric heating equipment.

At TSL 2, purchasers of non-weatherized gas furnaces would save, on average, an estimated $15 over the life of the product and purchasers of gas-fired boilers would save, on average, an estimated $208. The mean payback period for non-weatherized gas furnaces at TSL 2 is estimated to be 22 years, which is longer than the mean lifetime.

TSL 2 includes a standard for non-weatherized gas furnaces at 81-percent AFUE. DOE is concerned that, at this level, there is likely an increased risk of safety concerns with this equipment due to venting issues. Most manufacturers and DOJ commented that the margin of safety is diminished in many instances at 81-percent AFUE. Some manufacturers commented that they would not be willing to accept the risk and/or cost involved in producing a full line or family of products at 81-percent AFUE. This potential safety concern is a factor that the Secretary considers relevant. Based on DOE's evaluation of all the information considered during the rulemaking, DOE believes that a standard at 81-percent AFUE for non-weatherized gas furnaces could pose a potential for safety problems for some consumers.

The projected change in industry value ranges from a loss of INPV of $136 to a loss of $179 million. TSL 2 potentially could result in up to a nine-percent loss in INPV for the furnace industry and up to a 15-percent loss in INPV for the boiler industry. However, DOE anticipates that manufacturers of non-weatherized gas furnaces would still be able to differentiate their premium products and retain profitability margins.

After carefully considering the results of the analysis, comments on the NOPR, and the benefits versus burdens, the Secretary concluded that at TSL 2, the benefits of energy savings and emissions impacts would be outweighed by the reduction in industry value for manufacturers and the safety concerns related to potential venting failure due to condensation with non-weatherized gas furnaces at 81 percent AFUE. Consequently, the Secretary has concluded that TSL 2 is not economically justified.

Next, DOE considered TSL A. Primary energy savings at this level is projected to be 0.25 quad of energy through 2038, which DOE considers significant. Discounted at seven percent, the energy savings through 2038 is calculated to be 0.06 quads. For the Nation as a whole, TSL A would likely result in a net savings of $0.69 billion in NPV, discounted at seven percent. The emissions reductions are projected at 7.8 Mt of CO_2, 9.2 kt of NO_X, and 1.8 kt of SO_2. Total generating capacity in 2030 under TSL A would likely increase by 0.5 GW due to the projected switching from gas furnaces to electric heating equipment.

At TSL A, purchasers of non-weatherized gas furnaces would save, on average, an estimated $2 over the life of the product and purchasers of gas-fired boilers would save, on average, an estimated $208. DOE's analysis indicates that no households purchasing non-weatherized gas furnaces would experience an increase in LCC at TSL A, including southern households. The calculated mean payback periods are less than the average equipment lifetime for all product classes at TSL A. For example, the mean payback period for non-weatherized gas furnaces at TSL A is calculated to be 1.7 years.

The projected change in industry value ranges from a loss of INPV of $48 million to a loss of $74 million. TSL A potentially could result in up to a four-percent loss in INPV for the furnace industry and up to a five-percent loss in INPV for the boiler industry. Furthermore, DOE anticipates that manufacturers of non-weatherized gas furnaces would still be able to differentiate their premium products and retain profitability margins.

TSL A includes an 83-percent AFUE standard level for oil-fired boilers. DOE notes that the joint stakeholder recommendation for boilers suggested an 84-percent AFUE standard level (in combination with a temperature reset design requirement) for oil-fired boilers, which is estimated to result in greater energy savings than the 83-percent level proposed in the NOPR and included in TSL A. DOE concluded that the 84-percent AFUE for oil-fired boilers was inconsistent with the other standard levels included in TSL A. TSL A was derived from TSL 2, which was described in the NOPR. As discussed in the NOPR, TSL 2 represents the set of efficiency levels, which yield the maximum NPV, and an 83-percent AFUE for oil boilers is consistent with this grouping of standard levels for analysis. 71 FR 59203.

After carefully considering the analysis, comments on the NOPR, and the benefits and burdens, the Secretary concludes that this standard saves a significant amount of energy and is technologically feasible and economically justified. DOE also believes the efficiency levels contained in TSL A do not pose a safety or health risk to consumers. Therefore, DOE is adopting the energy conservation standards for residential furnaces and boilers at TSL A.

VII. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

This regulatory action has been determined to be a ''significant regulatory action'' under section 3(f)(1) of Executive Order 12866, ''Regulatory Planning and Review.'' 58 FR 51735 (October 4, 1993). The Executive Order requires that each agency identify in writing the specific market failure or other specific problem that it intends to address that warrant new agency action, as well as assess the significance of that problem, to enable assessment of whether any new regulation is warranted. Executive Order 12866, § 1(b)(1).

In the context of furnaces and boilers, problems are expected to arise due to: (1) Lack of consumer information and/or information processing capability about energy efficiency opportunities; (2) misplaced incentives, which separate responsibility for buying new appliances and for paying their operating costs; (3) transactions costs, which prevent access to capital to finance energy efficiency investment; and (4) imperfect competition, which may prevent energy efficient appliances from reaching the market place. Furthermore, for renters in particular, there are split incentives for more energy efficient equipment. The owner of the home (landlord) may not invest in efficient equipment because the

landlord does not pay the energy bill, and the renter does not want to invest so as not to risk losing the capital investment if the renter moves. Furthermore, imperfect competition may prevent many efficient technologies from reaching the market. In this case, individual manufacturers may be limited by capital rationing or more concerned with competing under existing market conditions, than with offering a full range of energy efficient products to consumers.

Today's action also required a regulatory impact analysis (RIA) and, under the Executive Order, was subject to review by the Office of Information and Regulatory Affairs (OIRA) in OMB. DOE presented to OIRA for review the draft final rule and other documents prepared for this rulemaking, including the RIA, and has included these documents in the rulemaking record. They are available for public review in the Resource Room of the Building Technologies Program at 950 L'Enfant Plaza Drive, SW., Washington, DC 20024, (202) 586–9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

The RIA calculates the effects of feasible policy alternatives to residential furnace and boiler standards, and provides a quantitative comparison of the impacts of the alternatives. DOE evaluated each alternative in terms of its ability to achieve significant energy savings at reasonable costs, and compared it to the effectiveness of the proposed rule. DOE analyzed these alternatives using a series of regulatory scenarios as input to the NES/Shipments Model for furnaces and boilers, which it modified to allow inputs for these measures. 71 FR 59253–59255. The complete RIA, ''Regulatory Impact Analysis for Proposed Energy Conservation Standards for Residential Furnaces and Boilers,'' is contained in the TSD prepared for today's rule. The RIA consists of: (1) A statement of the problem addressed by this regulation, and the mandate for government action; (2) a description and analysis of the feasible policy alternatives to this regulation; (3) a quantitative comparison of the impacts of the alternatives; and (4) the national economic impacts of the proposed standards.

As explained in the NOPR, DOE determined that, with the exception of regional performance standards, which DOE has determined it lacks authority to adopt, none of the alternatives it examined would save as much energy or have an NPV as high as the proposed standards. 71 FR 59253. The same conclusions apply to the standards in this final rule. In addition, several of the alternatives would require new enabling legislation, since authority to carry out those alternatives does not presently exist. Additional detail on the regulatory alternatives is found in the RIA report in the final rule TSD.

B. Review Under the Regulatory Flexibility Act

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

Small businesses, as defined by the Small Business Administration (SBA) for both furnace manufacturers and boiler manufacturers, are manufacturing enterprises with 750 employees or fewer. Prior to issuing the proposed rule in this rulemaking, DOE interviewed five such small businesses affected by the rulemaking.

As explained in the NOPR, DOE reviewed the proposed rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. 71 FR 59255–59256. On the basis of this review, DOE certified that the proposed rule, if promulgated, would ''have no significant economic impact on a substantial number of small entities.'' 71 FR 59256. Therefore, DOE did not prepare an initial regulatory flexibility analysis for the proposed rule. DOE transmitted its certification and a supporting statement of factual basis to the Chief Counsel for Advocacy of the SBA for review.

DOE received no comments on the certification in response to the NOPR, and reaffirms the certification. Therefore, DOE has not prepared a final regulatory flexibility analysis for this rule.

C. Review Under the Paperwork Reduction Act

DOE stated in the NOPR that this rulemaking would impose no new information and recordkeeping requirements, and that, therefore, OMB clearance is not required under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). 71 FR 59256. DOE received no comments on this in response to the NOPR, and, as with the proposed rule, today's rule imposes no information and recordkeeping requirements. Therefore, DOE has taken no further action in this rulemaking with respect to the Paperwork Reduction Act.

D. Review Under the National Environmental Policy Act

DOE prepared an environmental assessment of the impacts of today's standards (DOE/EA–1530), which it published as a separate report within the TSD for this rule. DOE found the environmental effects associated with various standard efficiency levels for residential furnaces and boilers to be not significant, and therefore it is issuing a Finding of No Significant Impact (FONSI) pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), the regulations of the Council on Environmental Quality (40 CFR parts 1500–1508), and DOE's regulations for compliance with the National Environmental Policy Act (10 CFR part 1021). The FONSI is available in the docket for this rulemaking.

E. Review Under Executive Order 13132

DOE reviewed this rule pursuant to Executive Order 13132, ''Federalism,'' 64 FR 43255 (August 4, 1999), which imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. In accordance with DOE's statement of policy describing the intergovernmental consultation process it will follow in the development of regulations that have federalism implications, 65 FR 13735 (March 14, 2000), DOE examined the proposed rule and determined that the rule would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. 71 FR 59256. DOE received no comments on this issue in response to the NOPR, and its conclusions on this issue are the same for the final rule as they were for the proposed rule. Therefore DOE is taking

no further action in today's final rule with respect to Executive Order 13132.

F. Review Under Executive Order 12988

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

G. Review Under the Unfunded Mandates Reform Act of 1995

As described in the NOPR, Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) (UMRA) imposes requirements on Federal agencies when their regulatory actions will have certain types of impacts on State, local, and Tribal governments and the private sector. 71 FR 59256–59257. DOE concluded that, because the proposed rule would contain neither an intergovernmental mandate nor a mandate that would likely result in expenditures in the residential furnace and boiler industry of $100 million or more in any year, the requirements of UMRA do not apply to the rule. 71 FR 59257. DOE received no comments concerning the UMRA in response to the NOPR, and its conclusions on this issue are the same for the final rule as they were for the proposed rule. Therefore, DOE is taking no further action in today's final rule with respect to the UMRA.

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

DOE determined that, for this rulemaking, it need not prepare a Family Policymaking Assessment under section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105–277). 71 FR 59257. DOE received no comments concerning section 654 in response to the NOPR, and, therefore, is taking no further action in today's final rule with respect to this provision.

I. Review Under Executive Order 12630

DOE determined, under Executive Order 12630, ''Governmental Actions and Interference with Constitutionally Protected Property Rights,'' 53 FR 8859 (March 18, 1988), that today's rule would not result in any takings which might require compensation under the Fifth Amendment to the United States Constitution. 71 FR 59257. DOE received no comments concerning Executive Order 12630 in response to the NOPR, and, therefore, is taking no further action in today's final rule with respect to this Executive Order.

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

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

K. Review Under Executive Order 13211

Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,'' 66 FR 28355 (May 22, 2001) requires Federal agencies to prepare and submit to the Office of Information and Regulatory Affairs of the OMB a Statement of Energy Effects for any significant energy action. DOE determined that the proposed rule was not a ''significant energy action'' within the meaning of Executive Order 13211. 71 FR 59257. Accordingly, it did not prepare a Statement of Energy Effects on the proposed rule. DOE received no comments on this issue in response to the NOPR. As with the proposed rule, DOE has concluded that today's final rule is not a significant energy action within the meaning of Executive Order 13211, and has not prepared a Statement of Energy Effects on the rule.

L. Review Under the Information Quality Bulletin for Peer Review

On December 16, 2004, OMB, in consultation with the Office of Science and Technology Policy (OSTP), issued its Final Information Quality Bulletin for Peer Review (the Bulletin). 70 FR 2664, January 14, 2005. The Bulletin establishes that certain scientific information shall be peer reviewed by qualified specialists before it is disseminated by the Federal government, including influential scientific information related to agency regulatory actions. The purpose of the Bulletin is to enhance the quality and credibility of the Government's scientific information.

DOE's Office of Energy Efficiency and Renewable Energy, Building Technologies Program, held formal in-progress peer reviews covering the analyses (e.g., screening/engineering analysis, LCC analysis, MIA, and utility impact analysis) used in conducting the energy efficiency standards development process on June 28–29, 2005. The in-progress review is a rigorous, formal, and documented evaluation process using objective criteria and qualified and independent reviewers to make a judgment of the technical/scientific/business merit, the actual or anticipated results, and the productivity and management effectiveness of programs and/or projects. The Building Technologies Program staff is preparing a peer review report which, upon completion, will be disseminated on the Office of Energy Efficiency and Renewable Energy's Web site and included in the administrative record for this rulemaking.

M. Review Under Executive Order 12898

DOE considers environmental justice under Executive Order 12898, ''Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.'' 59 FR 7629 (February 16, 1994). The Executive Order requires Federal agencies to assess whether a proposed Federal action causes any disproportionately high and adverse human health or environmental effects on low-income or minority populations. DOE evaluated the socioeconomic effects of standards on low-income households and found

that they are similar to the impacts on the rest of the population.

N. Congressional Notification

As required by 5 U.S.C. 801, DOE will submit to Congress a report regarding the issuance of today's final rule prior to the effective date set forth at the outset of this notice. The report will state that it has been determined that the rule is a ''major rule'' as defined by 5 U.S.C. 804(2). DOE also will submit the supporting analyses to the Comptroller General in the U.S. Government Accountability Office (GAO) and make them available to each House of Congress.

VIII. Approval of the Office of the Secretary

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

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Energy conservation, Household appliances.

Issued in Washington, DC, on November 8, 2007.

Alexander A. Karsner,

Assistant Secretary, Energy Efficiency and Renewable Energy.

■ For the reasons set forth in the preamble, part 430 of Title 10, Code of Federal Regulations, is amended to read as set forth below.

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

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

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

■ 2. Section 430.32 is amended by revising the section heading and paragraph (e) to read as follows:

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

* * * * *

(e) *Furnaces.* (1) Non-weatherized and weatherized gas furnaces, mobile home gas furnaces, oil-fired furnaces, and gas- and oil-fired boilers, manufactured before November 19, 2015 and all other types of furnaces, shall have an efficiency no less than:

Product class	AFUE [1] (percent)	Effective date
(i) Furnaces (excluding classes noted below) (percent)	78	01/01/92
(ii) Mobile Home Furnaces	75	09/01/90
(iii) Small furnaces (other than furnaces designed solely for installation in mobile homes) having an input rate of less than 45,000 Btu/hr:		
(A) Weatherized (outdoor)	78	01/01/92
(B) Non-weatherized (indoor)	78	01/01/92
(iv) Boilers (excluding gas steam) (percent)	80	01/01/92
(v) Gas steam boilers (percent)	75	01/01/92

[1] Annual Fuel Utilization Efficiency, as determined in § 430.22(n)(2) of this part.

(2) Non-weatherized and weatherized gas furnaces, mobile home gas furnaces, oil-fired furnaces, and gas- and oil-fired boilers, manufactured on or after November 19, 2015, shall have an efficiency no less than:

Product class	AFUE [1] (percent)
(i) Non-weatherized gas furnaces	80
(ii) Weatherized gas furnaces	81
(iii) Mobile home gas furnaces	80
(iv) Oil-fired furnaces	82
(v) Gas hot-water boilers	82
(vi) Oil-fired hot-water boilers	83

[1] Annual Fuel Utilization Efficiency, as determined in § 430.22(n)(2) of this part.

* * * * *

Appendix

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

Department of Justice

Antitrust Division, Main Justice Building, 950 Pennsylvania Avenue, N.W., Washington, DC 20530–0001, (202) 514–2401/(202) 616–2645 (Fax), E-mail: *antitrust@usdoj.gov,* Web site: *http://www.usdoj.gov/atr.*

January 16, 2007.

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

Dear Deputy General Counsel Belmar:

I am responding to your November 14, 2006 letters seeking the views of the Attorney General about the potential impact on competition of proposed energy efficiency standards relating to (1) liquid-immersed and medium-voltage, dry-type distribution transformers (''distribution transformers''), and (2) residential furnaces and boilers (''furnaces and boilers''). The Energy Policy and Conservation Act (''EPCA'') authorizes the Department of Energy (''DOE'') to establish energy conservation standards for a number of appliances where DOE determines that those standards would be technologically feasible, economically justified, and result in significant energy savings.

Your requests were submitted pursuant to Section 325(o)(2)(B)(I) of the Energy Policy and Conservation Act, 42 U.S.C. 6291, 6295 (''EPCA''), which states that, before the Secretary of Energy may prescribe a new or amended energy conservation standard, the Secretary shall ask the Attorney General to make a determination of ''the impact of any lessening of competition * * * that is likely to result from the imposition of the standard.'' The Attorney General's responsibility for responding to requests from other departments about the effect of a program on competition has been delegated to the Assistant Attorney General for the Antitrust Division in 28 CFR 0.40(g). In conducting its analysis the Antitrust Division examines whether a standard may lessen competition, for example, by placing certain manufacturers of a product at an unjustified competitive disadvantage compared to other manufacturers, or by inducing avoidable inefficiencies in production or distribution of particular products. In addition to harming consumers directly through higher prices, these effects could undercut the ultimate goals of the legislation.

Your requests included the Notices of Proposed Rulemaking (''NOPR'') that were published in the **Federal Register** and transcripts of public hearings relating to the proposed standards. The NOPR relating to distribution transformers proposed Trial Standard Level 2 and explained why DOE had decided not to propose higher trial standard levels. The NOPR relating to furnaces and boilers proposed the following standards: 80% annual fuel utilization efficiency (''AFUE'') for non-weatherized gas furnaces and mobile home gas furnaces; 82% AFUE for oil-fired furnaces; 83% AFUE for weatherized gas furnaces and oil-fired boilers; and 84% AFUE for gas boilers. Our review regarding distribution transformers and furnaces and boilers has focused upon the standards DOE has proposed adopting; we have not determined the impact on competition of more stringent standards than those set forth in the NOPRs.

In addition to the NOPRs and transcripts, your staff provided us comments that had

been submitted to DOE regarding the proposed standards. (We understand that the docket has not closed with respect to furnaces and that more comments may be forthcoming.) We have reviewed these materials and additionally conducted interviews with members of the industries.

Based on this inquiry, the Division is concerned that the distribution transformer Trial Standard Level 2 may adversely affect competition with respect to distribution transformers used in industries, such as underground coal mining, where physical conditions limit the size of equipment that can be effectively utilized. We understand manufacturers would not be able to satisfy the proposed standard without increasing the size (or decreasing the power) of each class of distribution transformer. Firms facing space constraints would incur significantly increased costs due to enlarging the required installation space (which, for example, could involve removal of solid rock around coal seams in underground mines) or reconfiguring the size and number of each class of distribution transformers at each site. The resulting cost increases could constitute production inefficiencies that could make certain products less competitive. For example, the rule could, by raising the costs of certain coal mines, adversely affect production decisions at those mines and potentially result in increased use of less efficient energy alternatives. We urge the DOE to consider these concerns carefully in its analysis, and to consider creating an exception for distribution transformers used in industries with space constraints.

The Division is also concerned that the standards for weatherized gas furnaces and gas boilers could adversely affect competition. We understand that manufacturers would have difficulty designing products that safely meet the proposed standards. For weatherized gas furnaces, meeting the standard would likely result in increased condensation, potentially resulting in significant deterioration that would jeopardize the safety of the product, and, for weatherized gas-fired water boilers, meeting the standard would make effective carbon dioxide venting more difficult. Any resulting costs incurred to solve these issues could adversely affect the competitiveness of these products in relation to electric heat pumps and water heaters. We urge the DOE to carefully consider its proposed standards in light of these concerns.

Aside from the discussion above, the Division does not otherwise believe the proposed standards would adversely impact competition.

Yours sincerely,

J. Bruce McDonald,

Acting Assistant Attorney General.

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