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Energy Conservation Program for Consumer Products: Energy Conservation Standards for Electric Cooking Products (Electric Cooktops, Electric Self-Cleaning-Ovens, and Microwave Ovens); Final Rule

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

10 CFR Part 430

[Docket Number EE–RM–S–97–700]

RIN 1904–AA84

Energy Conservation Program for Consumer Products; Energy Conservation Standards for Electric Cooking Products (Electric Cooktops, Electric Self-Cleaning-Ovens, and Microwave Ovens)

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy (DOE).

ACTION: Final rule.

SUMMARY: The Energy Policy and Conservation Act, as amended, prescribes energy conservation standards for certain major household appliances and requires the Department of Energy (DOE or Department) to administer an energy conservation program for these products. The National Appliance Energy Conservation Act amendments require DOE to consider amending the energy conservation standards for cooking products. DOE today promulgates this final rule to address the energy conservation standard for electric cooking products (including microwave products) and substitute the term ''cooking products'' for the current, obsolete term ''kitchen ranges and ovens.'' DOE is not addressing at this time gas cooking products because it has not completed its analysis of the relevant issues.

DOE has determined that there would be no significant conservation of energy for electric cooktops, electric self-cleaning ovens and microwave ovens, and standards would not be economically justified. Therefore, the Department will not add new standards for these products. The Department, however, is amending its regulations to substitute the name ''kitchen ranges and ovens'' with ''cooking products'.

EFFECTIVE DATE: This rule is effective October 8, 1998.

ADDRESSES: A copy of the Technical Support Document (TSD) for these products may be read at the DOE Freedom of Information Reading Room, U.S. Department of Energy, Forrestal Building, room 1E–190, 1000 Independence Avenue, S.W., Washington, D.C. 20585, (202) 586–3142, between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. Copies of the TSD may be obtained from: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Forrestal Building, Mail Station EE–43, 1000 Independence Avenue, S.W., Washington, D.C. 20585. (202) 586–9127.

FOR FURTHER INFORMATION CONTACT: Kathi Epping, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, EE–43, 1000 Independence Avenue, S.W., Washington, D.C. 20585–0121, (202) 586–7425, or Eugene Margolis, Esq., U.S. Department of Energy, Office of General Counsel, GC–72, 1000 Independence Avenue, S.W., Washington, D.C. 20585, (202) 586–9507.

SUPPLEMENTARY INFORMATION:

I. Introduction

a. Authority

Part B of Title III of the Energy Policy and Conservation Act (EPCA), P.L. 94–163, as amended by the National Energy Conservation Policy Act (NECPA), P.L. 95–619, by the National Appliance Energy Conservation Act (NAECA), P.L. 100–12, by the National Appliance Energy Conservation Amendments of 1988 (NAECA 1988), P.L. 100–357, and the Energy Policy Act of 1992 (EPAct), P.L. 102–486[1] created the Energy Conservation Program for Consumer Products other than Automobiles. The consumer products subject to this program are called ''covered products.'' The covered products specified by statute include kitchen ranges and ovens. EPCA, § 322, 42 U.S.C. 6292.

For kitchen ranges and ovens, EPCA prescribed an initial Federal energy conservation standard effective in 1990 and specified that the Department shall publish a final rule no later than January 1, 1992, to determine if the 1990 standards should be amended. EPCA, § 325(h), 42 U.S.C. 6295(h). Any new or amended standard is required to be designed so as to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. EPCA, § 325(o)(2)(A), 42 U.S.C. 6295(o)(2)(A). The Secretary may not prescribe any amended standard which increases the maximum allowable energy use or decreases the minimum required energy efficiency of a covered product. EPCA, § 325(o)(1), 42 U.S.C. 6295(o)(1).

Section 325(o)(2)(B)(i) provides that DOE, in determining whether a standard is economically justified, must determine whether the benefits of the standard exceed its burdens, based, to the greatest extent practicable, on a weighing of the following seven factors:

(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, 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 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.

[1] The Energy Policy and Conservation Act, as amended by the National Energy Conservation Policy Act, the National Appliance Energy Conservation Act, the National Appliance Energy Conservation Amendments of 1988, and the Energy Policy Act of 1992, is referred to in this notice as the ''EPCA.'' Part B of Title III is codified at 42 U.S.C. 6291 et seq.

In addition, section 325(o)(2)(B)(iii) establishes a rebuttable presumption of economic justification in instances where the Secretary determines that ''the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy savings during the first year that the consumer will receive as a result of the standard, as calculated under the applicable test procedure.''

The Department analyzes the merits of efficiency improvements for each class of product independently. The Department applies the same criteria to determine the technological feasibility and economic justification of each product class, regardless of fuel type.

b. Background

The current standard (effective January 1, 1990) states that kitchen ranges and ovens with an electrical supply cord shall not be equipped with a constant burning pilot light.

In 1990, DOE published an advance notice of proposed rulemaking with regard to standards for nine covered products, including electric kitchen ranges and ovens. 55 FR 39624 (September 28, 1990) (hereinafter referred to as the September 1990 advance notice). The September 1990 advance notice presented the product classes that DOE planned to analyze and provided a detailed discussion of the analytical methodology and analytical models that the Department expected to use.

On March 4, 1994, DOE published a notice of proposed rulemaking (NOPR) concerning eight products, including the kitchen ranges and ovens. 59 FR 10464 (March 4, 1994) (hereinafter referred to as the Proposed Rule.) The Department proposed that the annual energy use of kitchen ranges and ovens shall be the sum of the annual energy use of any of the following components incorporated into the kitchen range and oven and shall not exceed the allowable sum of energy usages for those components listed in Table 1–1. These proposed standards were estimated to save 5.9 quads.

TABLE 1–1.—PROPOSED STANDARDS LEVELS FOR KITCHEN RANGES AND OVENS

Kitchen range and oven component	Annual energy use, effective as of September 10, 2001
1. Electric ovens, self-cleaning	267 kWh.
2. Electric ovens, non-self-cleaning.	218 kWh.
3. Gas ovens, self-cleaning	1.64 MMBtu.
4. Gas ovens, non-self-cleaning.	1.14 MMBtu.
5. Microwave ovens	233 kWh.
6. Electric cooktop, coil element.	260 kWh.
7. Electric cooktop, smooth element.	294 kWh.
8. Gas cooktop	1.71 MMBtu.

DOE received over 8,000 comments during the comment period on the 1994 Proposed Rule and from participants at the public hearings held in Washington, DC on April 5–7, 1994 and June 7–8, 1994. 59 comments dealt specifically with kitchen ovens, cooktops, and microwave ovens.

After reviewing the comments on the proposed standards for kitchen cooktops, conventional ovens, and microwave ovens, the Department concluded that a number of significant issues were raised which required additional analysis. In 1995, the Department revised the analyses regarding kitchen cooktops, ovens, and microwave ovens to account for the comments and data received during the public comment period. (This revised analysis became the basis for the 1996 Draft Report.)

A moratorium was placed on publication of proposed or final rules for appliance efficiency standards as part of the FY 1996 appropriations legislation. Pub. L. 104–134. That moratorium expired on September 30, 1996.

In 1995 and 1996, the Department conducted a review of its process for developing appliance energy efficiency standards. This review resulted in the publication of a final rule, entitled ''Procedures for Consideration of New or Revised Energy Conservation Standards for Consumer Products'' (hereinafter referred to as the Process Rule). 61 FR 36973 (July 15, 1996). Although the new procedures in the Process Rule do not apply to this rulemaking (61 FR at 36980) DOE has employed an approach consistent with the new procedures in completing work on this rule. In keeping with the new process, and based on comments received in response to the Proposed Rule, DOE distributed for comment a Draft Report on the Potential Impact of Alternative Energy Efficiency Levels for Residential Cooking Products (hereinafter referred to as Draft Report). The Draft Report contained DOE's revised analysis, begun in 1995, examining five alternative efficiency levels. The revised analysis drastically reduced the amount of energy which could be saved at each efficiency level. The Draft Report was distributed to a mailing list that included all of the commenters on the proposed rule on kitchen cooktops, ovens, and microwave ovens on May 5, 1996. (EE–RM–S–97–700 No. 1 and No. 2.) The letter invited comment on the Draft Report by no later than July 1, 1996. During June and July 1996, DOE received three comments on the Draft Report and related issues.

The analysis in the Draft Report indicates that establishing new or revised standards for microwave ovens is not economically justified because the payback period exceeds the life of the product and would produce increased life-cycle costs and a negative net present value. The analysis in the Draft Report and the comments received prompted further examination of gas cooktops, gas ovens, and electric non-self-cleaning ovens. DOE prepared an analysis to supplement the Draft Report that focuses exclusively on the possible elimination of standing pilot lights for gas products and improving non-self-cleaning conventional electric ovens by venting and insulating them like self-cleaning electric ovens. The supplemental analysis used the latest available data from AHAM regarding the trends over time of shares of sales of non-self-cleaning conventional ovens and gas products with pilot lights. It also used the latest utility price forecasts from the Annual Energy Outlook of the Energy Information Administration, AEO 97, and the Gas Research Institute, GRI 97.

In a **Federal Register** Notice of limited reopening of the record and opportunity for public comment (63 FR 9975) dated February 27, 1998, the Department reopened the comment period for cooking products for 30 days. This notice announced the availability of the supplemental analysis and gave indication of the prescriptive standard the Department was inclined to promulgate in the final rule. The notice also indicated the Department's intent to change the name of this rulemaking from ''kitchen ranges and ovens'' to ''cooking products.'' This change was made because the term ''kitchen ranges and ovens'' does not accurately describe the products considered which include conventional ranges, cooktops and ovens and microwave ovens.

Due to a request by the American Gas Association (AGA) for additional time,

this notice was followed by another notice reopening the comment period through April 28, 1998. The Department received 31 comments in response to these notices. Based on the comments to the Reopening Notice that identified significant issues surrounding gas cooking products, DOE decided to sever the electric cooking products from the gas cooking products in this rulemaking.

II. Discussion of Electric Cooking Products Comments

This section addresses comments to the 1994 Proposed Rule, the 1996 Draft Report, the Supplemental Analysis, and the 1998 reopening notice.[2] This section only addresses comments relating to electric cooking products and does not discuss gas cooking products.

a. Classes

Microwave Ovens

D. Wilson (Frigidaire, Transcript, Apr. 7 at 268) commented that heating elements are a utility to Frigidaire's customers and therefore require an additional product class for microwave ovens. Les Harris (Sharp Electronics Corporation, Transcript, Apr. 7 at 285–288) commented that there should be separate product classes for the convection and browner type microwave ovens based on their specific utility, as well as additional product classes for different cavity sizes. Jack Weizeorick (AHAM, Transcript, Apr. 7 at 258–260) also argued for two product classes: conventional microwave ovens with and without browning elements. He based this argument on the test procedure which he says does not measure the energy that the browning element absorbs from the microwaves. Mr. Weizeorick also argued for a third product class to include combination microwave/convection ovens.

Amana Refrigeration, Inc. (No. 347 at 6) urged DOE to define a specific product class for convection/microwave ovens because of the browning utility which causes a loss of about four percentage points of efficiency. Frigidaire Company (No. 544 at 2) submitted that microwave ovens with browning elements need a separate product class because its data shows the browner versions are consistently lower in efficiency by 2.0 percent.

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 5–7) argued that DOE's approach of a single class microwave oven is too simplistic because there are certain design constraints in the various type products that have a significant effect on their design and efficiency. They commented that the following design differences in microwave ovens justify additional product classes: (a) (structurally) fixed ovens, (b) portable ovens, (c) heating elements in the oven which absorb microwave energy, (d) convection ovens where the heating elements are not located in the cooking cavity, and (e) volume efficiency relationships for portable ovens only. Consequently, AHAM recommended the adoption of five classes of microwave ovens, as follows:

1. Portable Microwave Only—Less than 0.8 ft^3 total cavity volume
2. Portable Microwave Only—0.8 to 1.19 ft^3 total cavity volume
3. Portable Microwave Only—1.2 ft^3 total cavity volume
4. Portable Microwave/Thermal
5. Built-in (Fixed)

Gregg Greulich (Whirlpool, No. 599 at 5) agreed with these classes, and Tim Brooks (Whirlpool, EE–RM–S–97–700 No. 6 at 2) reiterated in his 1996 comments the need for separate microwave oven classes in future rulemakings. O.P. Clay (Sharp, No. 521 at 2), relying on data supplied to DOE, supported at least three product classes: small cavity size, large cavity size, and convection/microwave ovens. C.M. Walsh (Thermador, No. 622 at 1) recommended that microwave ovens with a usable volume greater than 1.75 cubic feet be put into a separate category that is excluded from the standard.

Les Harris (Sharp Electronics Corporation, Transcript, Apr. 7 at 287–288) requested exclusion of the microwave standard for convection and browner type microwave ovens because of the small number that are sold and because they provide a specific utility different from the standard microwave oven.

The Department believes more efficiency/cost data is needed to separate the ovens into separate product classes. However, because DOE is not promulgating standards for microwave ovens in this rule (see section III. e.), the Department does not believe it is necessary to examine this issue at this time.

Commercial-type Products for Residential Use

L. Durden (Viking Range Corp, Transcript, Apr. 7 at 180, 189, 196, 197 and No. 866 at 1) requested a separate energy classification for commercial-type home cooking products. He argued that the replacement alternative for these products would be purely commercial products which consume large amounts of energy and are not safe for home use. A purely commercial range if placed next to cabinetry will not pass the heat requirements (will cause scorching and burning of the cabinetry). Mr. Durden stated that there is a precedent for separate product classes for through-the-door service refrigerators and larger-sized refrigerator freezers, and consequently, a similar consideration (separate energy class) should be considered for commercial-type home cooking products. G. Greulich (Whirlpool, Transcript, Apr. 7 at 219) suggested DOE have a more specific definition in regard to commercial-type versus standard products. AHAM (AHAM, No. 001 at 14–15) and R. Zipkin (Russell Range, Transcript, Jun. 7 at 323) recommended that DOE define a separate product class for high-capacity ranges.

C.B. Walsh (Thermador, No. 622 at 2–6) commented that the useful characteristics of the professional style range would have to be sacrificed in order for it to meet the best efficiency levels of a standard range. He commented that these appliances should be categorized as high capacity. He said the definition of a high capacity oven should be changed from a volume of 5 or more cubic feet to 4.5 or more cubic feet (to include a professional oven with the dimensions of 28 inches wide, 14 inches high, and 20 inches deep) and its bake burner energy minimum changed from 30,000 BTU/h to 22,500 BTU/h because efficiency improvements may make today's level of performance (at 30,000 BTU/h) possible with a burner rated at 25,000 BTU/h or less.

ACEEE (ACEEE, No. 557 at 23) commented that DOE should develop a separate product class for commercial products that are sold in limited quantities in the residential sector. Because the Department is not promulgating minimum energy efficiency standards for cooking products in today's rule, the Department believes this comment is not a concern at this time.

b. Design Options

Oven Door Window

The Department received several comments which argued there would be reduced utility and a decrease in efficiency with this design option. G. Greulich (Whirlpool, Transcript, Apr. 7

[2] Comments with unspecified docket numbers belong to docket number EE–RM–90–201. This docket contains the September 1990 advance notice and the 1994 Proposed Rule. Docket No. EE–RM–S–97–700 contains the 1996 Draft Report, comments to the 1996 Draft Report, comments to the 1998 reopening notice and the supplemental analysis. Comments from this docket are specified with Docket number EE–RM–S–97–700.

at 211–212) commented that more than half of its consumers prefer to purchase products with the window feature and those consumers say it is an important part of customer satisfaction from a utility standpoint. G. Greulich (Whirlpool, No. 391 at 7) and D. Karl Landstrom (Battelle, Transcript, Apr. 7 at 239–240 and Transcript, Jun. 7 at 292–294) commented that the 1994 proposed standard would adversely affect cooking utility and quality because of the number of times the consumer would open the door to check the food. H. Brooke Stauffer (AHAM, Transcript, Apr. 7 at 170–172, 177) argued that the elimination of the oven door window would not only reduce utility but also is probably prohibited by the NAECA Safe Harbor Provisions. AHAM (AHAM No. 001 at 6) said the Proposed Rule ''violates NAECA's 'safe harbor' prohibition against standards which result in significant adverse utility or feature impacts (Section 325 (o)(4)).''

Lyn Cook (Independent Home Economist, No. 749 at 1) conducted limited tests using 17 door openings with no window. She found the cooking results to be borderline to unacceptable in terms of cooking performance.

Arthur D. Little, Inc. (ADL, No. 001 at 22–24) commented that this option has a ''positive energy savings'' (from 12.49 to 14.35 percent for a standard oven) and a ''good payback.'' ADL also commented, however, this design option ''does change the utility of the oven, that is, consumers currently perceive a major benefit in the window option, and are willing to pay a premium for this feature.'' ADL reported 70 percent of all units shipped include a window.

W.W. Olson (Assoc Professor & Extension Housing Technology Specialist, No. 736 at 1) requested that the removal of the oven door window option be deleted from the proposed standard. She based her comment on the added burden this design would place on persons with limited strength or a painful grasp. In addition, the elimination of the oven window would burden people who use a wide range of wheeled assistive devices, frail people (early Alzheimers), and people with impaired sense of smell because the window would serve as an early visual warning of burning or a fire within the oven.

Margery Tippie (Redbook Magazine, No. 488 at 1) commented that all baked goods recipes state a range of baking times, e.g. ''bake 15 to 20 minutes, or until golden brown''. She said the consumers should ''begin checking for doneness at a minimum of 15 minutes baking time, and to proceed until the desired degree of doneness is achieved. An oven window helps in the process.'' She argued that without the window, there would be constant heat (energy) loss since the oven would be opened for frequent checking. Lydia Botham (Land O'Lakes, Inc., No. 623 at 1) commented that this design option (as well as reduced vent rate and improved door seals) may increase the energy efficiency of the oven, but more testing should be done to ensure consumers are not negatively impacted.

ACEEE (ACEEE, No. 557 at 23) commented that DOE should exclude this design option from the analysis, since it is just as likely to increase as decrease energy use.

P. Gordon (Marsco Manufacturing Co., No. 595 at 1) urged DOE to consider not eliminating the glass in oven doors as an option to gain energy efficiency. He commented that heat reflective glasses have been able to replace a very expensive borosilicate glass produced in Germany. Michael E. Hobbs (Marsco Manufacturing Co., No. 865 at 1) also urged DOE to reconsider this design option and to eliminate it. Senators Paul Simon, Carol Moseley-Braun and Barbara Boxer (U.S. Senate, No. 891 at 1, No. 892 at 1, and No. 907 at 1) also supported the argument to eliminate the oven door window design option.

DOE agrees with the various commenters that the removal of the oven door window may cause the users of the ovens to open the doors more frequently and therefore, has the potential to result in increased energy usage. The opportunity exists to improve the oven door window in the future. A newer, proven oven window material is needed that has higher thermal insulation properties, can withstand high oven temperatures, and has the mechanical strength compatible with the other oven parts. Until such a technology is proven, DOE will eliminate this design option.

Reduction of Thermal Mass

G. Greulich (Whirlpool, Transcript, Apr. 7 at 217) commented that Consumer Reports showed a customer preference for the larger oven cavity and not the 30 percent smaller oven cavity which was assumed in the TSD. Also, utility may potentially be lost because consumers may not be able to cook multiple dishes in a smaller oven. In addition, Whirlpool stated this design option affects product durability, manufacturing stability, product resistance, and susceptibility to being crushed during transit. Arthur D. Little, Inc. (AHAM, No. 001 at 21–22) commented that this design option will improve the oven efficiency, but reductions in material thickness are very limited. These limitations are based on: the average porcelain thickness needed for adequate wall coverage and sheet metal thickness reduction limitations (due to the use of already thin materials.) The ADL analysis showed that a ½ to 1 lb reduction in oven cavity thermal mass will reduce oven energy consumption by 0.35 to 0.70 percent. ACEEE (ACEEE, No. 557 at 23) commented that DOE should exclude this design option in the analysis because the quality and life of the ovens may be harmed.

The Department agrees with all arguments against inclusion of this design option. Due to the issues of consumer product safety and structural integrity, DOE has eliminated reduced thermal mass as a design option. However, the opportunity exists to improve this technology in the future. Newer, less expensive materials or coatings may be developed in the future which maintain structural strength, reduce or maintain cost, but reduce thermal mass.

Forced Convection

For electric ovens, G. Greulich (Whirlpool, Transcript, Apr. 7 at 215–216) commented that this design option would result in considerable changes in consumer utility because many recipes are not easily converted (from natural convection). The timing is different and ''generational recipes'' which are handed down from one generation to the next would not cook the same way. M. Thompson (Whirlpool, No. 391 at 13) also submitted that industry aggregate efficiency for electric self-clean ovens is 2 percent. They reported the industry aggregate incremental costs of this design option are approximately 6 to 7 times higher than the DOE TSD cost with payback periods dramatically increased (from 6 to 302 years for electric standard ovens and from 8 to 363 years for electric self-clean ovens). Lyn Cook (Independent Home Economist, No. 749 at 2) commented that this option would require a revolution in consumer cooking methods because it would dramatically change the way oven cooking is done.

Arthur D. Little, Inc (AHAM, No. 001 at 7–11) commented that based on its evaluation of available data, information provided by manufacturers, and oven thermal analysis, this option does not meet consumer payback requirements and changes the utility of the oven. ADL concluded that the overall energy savings is less than 8 kWh/y as compared to DOE's estimates of 41 kWh/y and 33 kWh/y for self-cleaning

and standard ovens, respectively. The reported incremental price increase for this option is $81.95 which would result in payback periods of 141 and 106 years, respectively, for these ovens.

ACEEE (ACEEE, No. 557 at 23) commented that this option looks promising. ACEEE argued against the comment concerning ''old family recipes'' and said such recipes may need modification, but this problem could be solved by allowing consumers to turn off this feature for a single use at a time.

The Department disagrees with arguments that consumer utility is decreased. The consumer is given the option to turn the forced convection feature on or off. The consumer is therefore given the choice to be more energy efficient. The Department realizes that certain recipes may have to be modified if the design option is used, but the consumer would learn how to use it if desired. Secondly, the technology is already in the marketplace. DOE recognizes that full credit for energy efficiency is not realized because the oven test procedure measures energy use over short periods of time. Certain foods would take less time (energy) to cook with convection, e.g. approximately 3 hours to cook an average turkey with convection, compared to 5–6 hours without it. The Department also believes this reduced cooking time increases utility to the consumer.

Improved Door Seals

M. Thompson (Whirlpool, Transcript, Apr. 7 at 223–224) argued that a little bit of leakage is absolutely critical especially when baking to allow enough moisture release. Gregg Greulich (Whirlpool, No. 391 at 9) commented that this design option needs to be considered in conjunction with the electric standard Reduced Vent Rate design option to minimize the overall impact on cooking performance. Lyn Cook (Independent Home Economist, No. 749 at 2) also recommended that DOE consider the Improved Door Seal and Reduced Vent Rate options together because both have an influence on the natural convective air flow through the oven cavity. Lydia Botham (Land O'Lakes, No. 623 at 1) commented that this design option may increase the energy efficiency of the oven, but more testing should be done.

For standard electric ovens, Arthur D. Little, Inc (AHAM, No. 001 at 17–18) analyzed this design option and concluded that it will have a very minor impact on oven efficiency (from 12.15 to 12.39 percent) and a price premium that creates a payback in excess of 10 years. Additionally, the cooking performance of the oven may be affected. Tim Brooks (Whirlpool, EE–RM–S–97–700 No. 6 at 2) commented that improved door seals are not justified because of insignificant energy savings (0.2%) with excessive payback—less than $1 saved per year.

DOE agrees with the comments that sufficient air flow through the oven cavity is required to allow for proper heating and moisture conditions while cooking. This design option does not call for elimination of the air flow by improved seals; it merely states they can be improved ''without sealing the oven completely.'' Moreover, because this design option was not contained in any standard levels the Department found to be economically justified in today's rule, the Department does not consider it to be an issue in this rulemaking.

Bi-Radiant Oven

Tim Brooks (Whirlpool, EE–RM–S–97–700 No. 6 at 3) stated that the 50 percent improvement assumption is unsupported by facts. He also noted technical problems making this design option impractical. The Department finds in today's rule that this design option is not economically justified.

Reflective Surfaces

Gregg Greulich (Whirlpool, No. 391 at 10) said that this design option causes loss of consumer utility (oven cleaning) and is not financially justified. He also commented that industry aggregate incremental costs of this design option are approximately 12 to 13 times higher than the DOE TSD cost, resulting in a 152 year payback (Transcript, Jun. 7 at 339). Tim Brooks (Whirlpool, EE–RM–S–97–700 No. 6 at 3) stated that maintaining highly reflective oven walls is impractical.

C.B. Walsh (Thermador, No. 622 at 2) commented that he was not aware of a reflective material which will retain its reflectivity after repeated exposure to pyrolytic self-cleaning oven temperatures (850–950F). Lyn Cook (Independent Home Economist, No. 749 at 2) commented that such surfaces would quickly discolor, and their longevity would be restricted. She recommended DOE eliminate this design option. ACEEE (ACEEE, No. 557 at 23) commented that DOE should exclude this design option in the analysis because it would be impossible to keep the surfaces clean and shiny, particularly in self-cleaning ovens.

Arthur D. Little, Inc (AHAM, No. 001 at 11–17) analyzed this design option for electric ovens and concluded: (1) current oven utility is not maintainable using reflective surfaces (the characteristics of this reflected radiation are different than the normal radiation emitted by the current cavity); (2) only modest energy savings are possible (from 12.15 baseline efficiency to 12.73 efficiency); and (3) consumer payback is long (8.62 to 11.33 years).

Marcia Copeland (Betty Crocker, EE–RM–S–97–700 No. 5 at 1) disagreed with the statement in the Draft Report that reflective pans are assumed to have no maintenance cost and could easily be maintained by the consumer. Copeland stated that Betty Crocker's experience with consumer testing indicates this assumption is incorrect but did not provide supporting data. Tim Brooks (Whirlpool, EE–RM–S–97–700 No. 6 at 3) concurred and stated that the pans would become non-reflective in about one year.

DOE agrees with the lack of sophistication in the technology to maintain a clean, reflective oven surface or reflective cooktop pans, and therefore achieve an energy efficiency improvement, over the life of the products. Therefore, DOE has eliminated the improved reflective surfaces in ovens and reflective pans for cooktops as design options in this rule.

Oven Separator

Marcia Copeland (Betty Crocker, EE–RM–S–97–700 No. 5 at 1) stated that an oven separator would have low consumer acceptance and only adds to the cost of the appliance. She also stated that the existence of a German model has no relevance for American consumers but did not provide any reasoning for this statement. However, because the Oven Separator design option only was used for max tech and was not found to be economically justified, the Department does not believe this issue is a concern.

Added Insulation

DOE received comments which said there would be loss of consumer utility with this design option and that it is not cost effective. D. Horstman (Maytag, No. 490 at 3) commented that manufacturers would be forced to reduce the oven cavity size drastically to comply with the proposed standards. He said there would be less utility to the consumer and insufficient fuel cost savings to justify the cost premium. Likewise, Gregg Greulich (Whirlpool, No. 391 at 11) submitted that this design option will reduce consumer utility (oven size), and result in an excessive payback (increase from 5 to 8 years for standard electric ovens and increase from 11 to 35 years for self-cleaning electric ovens). Whirlpool said this design option would not be justified.

Arthur D. Little, Inc (AHAM, No. 001 at 19–21) commented that its analysis shows that although a 2-inch increase in insulation will have a large impact (1.4 percentage points on a 12.15 percent efficiency baseline) on the oven energy usage, it will have a negative impact on the utility of the oven and range appliances. Either the size of the overall cabinet must increase, or the oven cavity volume must be reduced. In addition AHAM's comments agreed that thicker insulation (up to 4 inches) can achieve a 1.4 percentage point increase in oven efficiency, but the implementation of this design may affect the utility of the appliance for the reasons stated above.

The arguments against this design option involve reduction of consumer utility due to decreased oven cavity volume, if the same oven footprint is maintained. The Department has eliminated this design option because it reduces consumer utility and results in an increase in the life-cycle cost with a negligible decrease in energy use.

Improved Insulation

Tom Hoff (Microtherm Inc., No. 605 at 2–4) commented that his company has a micro porous thermal insulation which has significantly higher thermal insulation capability than existing technology and can be used in oven and range applications.

Maytag (Maytag, EE–RM–S–97–700 No. 9 at 4) stated that insulating the non-self-cleaning oven in a manner similar to the self-cleaning oven does not improve efficiency in a cost justifiable manner. Maytag stated that the higher efficiency of the self-cleaning models is not due solely to the difference in insulation but is also due to the several panes of heat reflective glass in the door and the inner baffles.

AHAM (AHAM, EE–RM–S–97–700 No. 26 at 3) commented that there is nothing in DOE's analysis which contradicts the significant evidence from manufacturers that further insulation will result in negligible savings in energy. AHAM commented that in order to attain any possible real increase in efficiency, non-self cleaning products would have to undergo total door reconstruction (including door seal, heat insulating glass) at great, cost-prohibitive expense.

The Department did consider higher performing insulation (See Draft Report Table 1–9) but did not consider the Microtherm product specifically due to a lack of data, particularly material costs and possible installation or fabrication cost. The Department only considered the increased performance and cost of higher density fiberglass insulation in existing cavities and did not consider changes to any door glass or inner baffles, although improved door seals were considered separately.

Reduced Vent Size

Gregg Greulich (Whirlpool, No. 391 at 9) commented that this design option needs to be considered in conjunction with the design option for Improved Door Seal design to minimize the overall impact on cooking performance. Marcia K. Copeland (General Mills, Inc., No. 355 at 2) commented that reducing oven vent size will negatively impact high moisture foods such as pound cake, two-crust fruit pies, roasting, meat loaf, lasagna, and foods that need drying such as pastry, biscuits, and cookies. The reduced vent size may result in increased baking time, and consumers will be less satisfied with the results. Karen Johnson (Borden, No. 560 at 1) supported these comments. Lydia Botham (Land O'Lakes, No. 623 at 1) commented that this design option may increase the energy efficiency of the oven, but more testing should be done.

Maytag (Maytag, EE–RM–S–97–700 No. 9 at 4) stated that because vent size is designed to be at an optimum for cooking performance, any reduction in size will affect cooking performance. Gregg Greulich (Whirlpool, EE–RM–S–97–700 No. 33 at 2) stated that the venting Whirlpool uses in self-cleaning ovens is virtually identical to the venting in its non-self-cleaning models. Whirlpool's testing shows that reducing the venting will only serve to degrade cooking performance and will not save energy.

AHAM (AHAM, EE–RM–S–97–700 No. 26 at 3) commented that DOE erroneously assumed that a reduction in the vent opening of a non-self-cleaning oven to the same size as a self-clean oven would result in energy savings. AHAM commented that vent openings are not automatically larger in non-self-cleaning ovens. AHAM stated that the size of the vent opening is determined by several factors, only one of which is the cleaning type. AHAM commented that if a smaller vent opening were effectively required for all models, the product performance would be degraded on some models by reducing the moisture loss.

Oven venting is necessary for the cooking process, but reducing the vent rate inherently reduces the energy lost in the cooking process and therefore, increases the overall efficiency of the oven. The Department assumed that self-cleaning ovens have smaller vents than non-self-cleaning ovens due to safety concerns regarding air flow during the high temperature cleaning cycle. Since the venting systems on self-cleaning ovens provide satisfactory cooking performance, it was assumed that these reduced vents could satisfactorily be applied to non-self-cleaning ovens and yield an efficiency improvement. However, this assumption is refuted by the Whirlpool comment that there is no difference in venting in its products and the AHAM comment that vent openings are not automatically larger in non-self-cleaning ovens. Thus, the Department has probably overstated any energy savings from this design option. In making today's determination DOE is not considering any energy savings from this design option.

Improved Contact Conductance

Arthur D. Little, Inc (AHAM, No. 001 at 24–27) reported the results of its analysis and testing on this design option for electric cooktops. Its results showed that the major mechanism for heat transfer was physical contact between the pot and coil, not contact pressure. The DOE test procedure uses an aluminum block which may be flatter than an actual cooking pot. ADL stated it found minimal real world efficiency improvements possible. The Department agrees that the heat transfer method is a function of physical contact and that this contact is influenced by the flatness of the object on the cooktop.

Improved Efficiency of the Magnetron Power Supply/Transformer

Charles Samuels (AHAM, Transcript, Apr. 7 at 51) argued that the transformer improvements were based on faulty communications between DOE's contractors and industry; consequently DOE has over-estimated the cost and energy improvement potential and not taken into account the problems with product size and weight that would be caused by more efficient transformers, even if technologically feasible.

D. Susak (Advance Transformer Company, Transcript, Apr. 7 at 272) commented that efficiency increases to 96 percent are not attainable at any price, much less at $5 as stated in the TSD. Mr. Susak reported results from some testing that resulted in a transformer efficiency of 91.4 percent with an additional cost of $6.45 per unit and a payback period greater than six years. This improvement was from only one of its current designs and should not be expected for all designs. Gregg Greulich (Whirlpool, No. 599 at 3) agreed with the Advance Transformer study and said that Whirlpool's own study corroborates it. He said this design option should be dropped. Jack Weizeorick, AHAM (April 7, rebuttal at

341–344) commented that the TSD reference ''(56)'' to C. Huene (TSD, Vol 2, App E, p 1–49) was incorrect. Mr. Huene was contacted, and he stated he never said that a 95 percent efficient transformer was available at a cost of $5.

O.P. Clay (Sharp, No. 521 at 2) commented that DOE's provided cost estimates of $7.90 for the purpose of increasing the efficiency of microwave ovens from 54 to 62.5 percent cannot be achieved. Data was supplied that showed a 1 percent improvement would cost $4.05, and achieving an additional 2.5 percent would cost $9.00. Sharp estimated the three design options proposed by DOE would cost at least $13.05 and only increase the efficiency 3.5 percent. Sharp urged that DOE not include microwave ovens in the rulemaking based on these estimates.

Robert Lagoussie, International Microwave Power Institute (April 7, at 309–310) commented that a technical paper by Dr. C. R. Buffler on an improved power supply was misinterpreted in the TSD. Mr. Lagoussie commented that the improvement was technically but not economically feasible in 1978, and it would be even less economically feasible today. D. Wilson (Frigidaire, Transcript, Apr. 7 at 262–263) commented that Dr. Buffler reported an efficiency number based on theory that was not meant to be a practical solution. The commenter reported that it will be difficult to improve the present efficiency levels of 45 to 50 percent dramatically unless there are technological breakthroughs.

Clayton Bond (Toshiba Corporation, Transcript, Apr. 7 at 317–318) commented that his company had met with the other three magnetron manufacturers in Japan (there are none in the U.S.), and their response to the proposed standard is that the efficiency of the magnetron can be increased marginally (1 percent, or from 71 to 72 percent), but the cost of even this marginal improvement would be cost prohibitive. This one percent increase in efficiency would result in a cost increase of more than double the current price of the tube in this country. Other concerns were that it would take three years to develop; it would require new tooling, jigs, and expensive materials, and this improved design would be sold only in the U.S. market which is one-third of the world market. Likewise, Gregg Greulich (Whirlpool, No. 599 at 3) commented that magnetrons produced today are 71% efficient with a maximum realistic efficiency of 72%. He argued that this design option should be dropped since the magnetrons are as efficient as possible already.

Dennis Wilson, Frigidaire (April 7, rebuttal at 345) commented that an increased efficiency microwave oven would require an increase in a transformer size and additional costs. Frigidaire's written comments (No.544 at 3) further argued that the company would be at an economic disadvantage in the European marketplace because this increased size would make the higher efficiency microwave oven incompatible with the common chassis used for both the domestic and export markets.

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 10) commented that the high efficiency transformer would be larger and heavier than the transformer used today and would result in an increase in the overall size of microwave ovens which would result in increased shipping costs since fewer could be shipped in a standard sized truck or container.

E. Toomey (Goldstar, No. 503 at 1) commented that her company is currently using a 95% efficient magnetron which ''leaves no room for improvement.'' At present, she said her company's ovens are already rated at close to 60% efficiency. ACEEE (ACEEE, No. 557 at 24) urged DOE to include the effects of the adoption of European power supply standards on U.S. microwave manufacturers.

DOE has analyzed the data which was submitted during the comment period and found the data to be contradictory in part. The comments summarized above indicate technological barriers to improving the efficiency of microwave ovens above the baseline value of 54 percent. However, AHAM data (AHAM, No. 001 at B–1) reports efficiency/cavity volume and efficiency/oven type which show many units above 54 percent efficiency and a significant number above 57 percent, thus indicating the technology exists to improve the efficiency of the ovens. Moreover, because this design option was not contained in any standard levels the Department found to be economically justified in today's rule, the Department does not consider it to be an issue in this rulemaking.

Modified Waveguide

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 11) commented that only a small efficiency improvement may be available on some microwave ovens by reducing the length or improving the finish on the waveguides. Many of the ovens produced in 1993 already have these new features. Gregg Greulich (Whirlpool, No. 599 at 3) agreed with this comment and said that this design option should be dropped. He also said that it is possible to increase the coupling between the magnetron and the cavity for a specific load in such a way that the efficiency would improve for that specific load. However, there were several significant disadvantages to this tight coupling which he supplied in his written comments. D. Wilson (Frigidaire, No. 544 at 4) commented that this design option would require the redesign and retooling of the waveguide since the waveguide itself is an integral part of the cavity design, and a separate part would be necessary in order to reduce the material costs. Cost estimates were provided in the written comments. The Department believes these comments are well founded. Therefore, this design option was eliminated.

Microwave Oven Fan Efficiency

Les Harris (Sharp Electronics Corporation, Transcript, Apr. 7 at 282–284) commented that the efficiency increase and associated cost increase with the fan in the TSD are in error. Various options are listed and agreement with the TSD is possible (at 0.8 percent increase), but the cost increase is $7 to $8.22, not $1.05 as stated in the TSD. This cost would significantly extend the payback period. Also, the improvement previously stated requires an electronically commuted DC motor, which has been theoretically proven, but not proven in practice.

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 11) commented that manufacturers' data indicates that most fans use between 15 and 32 watts of power, but some use a high of 75 watts. AHAM supplied data which shows an increased efficiency fan, which uses 15.2 watts over the ''standard'' fan which uses approximately 21 watts, at an additional cost of $2.20. If an electronically commuted DC motor were used, the power would be reduced to 7.7 watts at an additional cost of $8.25.

D. Wilson (Frigidaire, No. 544 at 4) commented that a more efficient fan motor could be manufactured without a capital investment but would require engineering and testing to qualify the component. The revised motor is assumed to be directly interchangeable with the current motor and not require a tooling investment. Cost estimates were provided in the written comments.

Gregg Greulich (Whirlpool, No. 599 at 3) commented that fans use about 25 watts and an efficiency improvement of 10% amounts to 2.5 watts. He stated this improvement could possibly double the cost of the fan which increases the payback period, while providing minimal energy savings. He

recommended deleting this design option.

The Department incorporated this data in the Draft Report analysis which showed a decreased efficiency improvement at increased cost.

c. Other Comments

Significance of Energy Savings

H. Brooke Stauffer (AHAM, Transcript, Apr. 7 at 169, 170) commented that AHAM does not believe a performance standard is justified because the amount of energy saved is insignificant. AHAM argued that the energy savings are exaggerated and the costs understated. AHAM said this position was based on tests conducted and data which suggests the costs reported in the TSD are one-third to one-fourth the actual manufacturer's cost to implement various design options. M. Thompson (Whirlpool, Transcript, Apr. 7 at 205, 206) gave annual cost savings for various design options and argued that their collective savings were small.

AHAM (AHAM, No. 001 at 6) further commented that because the energy used by ranges is minor, the proposed standards do not meet the threshold NAECA criterion that an amended standard must result in ''significant conservation of energy'' under Section 325 (o)(3)(B). AHAM argued that the total projected energy savings from proposed range performance standards are so low that the standard's benefits will not exceed its burdens as required under Section 325 (o)(2)(B)(i)(III).

While the term ''significant'' is not defined in EPCA, the U.S. Court of Appeals for the District of Columbia Circuit concluded that Congress intended the word ''significant'' to mean ''non-trivial.'' *Natural Resources Defense Council* v. *Herrington*. 768 F.2d 1355, 1373 (D.C.Cir. 1985). Thus, for this rulemaking, DOE concludes that at each trial standard level the estimated energy savings is non-trivial and therefore significant.

Life Cycle Costs

D. Karl Landstrom (Battelle, Transcript, Apr. 7 at 233–234) commented that the life cycle cost data should be updated by DOE to use current DOE Energy Information Administration estimates of future cost projections rather than the 1991 estimated projections.

Gregg Greulich (Whirlpool, No. 391 at 5) commented that if all of DOE's first seven design options were to be incorporated into a new standard self-clean electric range, the total annual cost savings would be $6.47. He pointed out that in 1979 (when the FTC first considered labeling ranges), a total annual operating cost savings difference of $7.00 would have been considered significant by consumers. The $6.47 figure translates into $3.33 in 1979 dollars, less than half of what the FTC deemed to be a significant cost savings to consumers.

Whirlpool (No. 391 at 6) also commented that DOE standards could affect eight different Whirlpool product categories. The cost of compliance in each product category will likely be millions to many tens of millions of dollars. Whirlpool argued that the cumulative impact of adding ranges, ovens, and cooktops, when coupled with the ''diminutive energy savings,'' makes energy standards for this product category unjustifiable.

The Department has recalculated life-cycle costs using the latest Annual Energy Outlook (AEO) energy prices available at the time of the analysis. The Draft Report used AEO 95 energy prices, and the supplemental analysis used AEO 97 energy prices. In addition, the Gas Research Institute (GRI) 97 prices were used for a basis of comparison in the Supplemental Analysis.

Test Procedures

There were many comments on the test procedures, including annual energy consumption. These comments, however, were discussed and resolved in the Test Procedure Final Rule for Kitchen Ranges, Cooktops, Ovens, and Microwave Ovens. 62 FR 51976 (October 3, 1997).

Economic hardship

Joann Prater (MCD Corporation, Transcript, Apr. 7 at 276–277) commented that MCD Corporation would probably go out of business if the new microwave ruling is enacted for the following reasons: MCD Corporation is a small, single-line product company which recently invested $5M in tooling for a new, more efficient oven which is scheduled to enter the market this year. This new oven, however, does not meet the new efficiency standard proposed in the NOPR. The company would not be able to capture its investment during the shorter period its new product would be on the market, and MCD could not retool for another new oven to be manufactured by the effective date of the new standards. She also commented that several assumptions in the TSD are incorrect. She maintained that the cost to retool is understated because the TSD did not include the additional costs to redesign features such as the power supply, the fan, the modified waveguide, an improved magnetron, and new reflective surfaces. The TSD accounts for only the wave guide. The oral testimony was also supported by written comments (MCD Corporation, No. 742 at 1–20).

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 1) commented that the proposed standards for microwave ovens would ''eliminate the last remaining U.S. production and may concentrate U.S. sales in the hands of only one or two companies.'' J. Geary (Peerless-Premier Appliance Co., No. 352 at 1) commented about the adverse economic impact and the potential lessening of competition that the proposed standards would have on his company. He commented that DOE and the Attorney General had not adequately evaluated the impact of the standards on small manufacturers.

D. Horstman (Maytag, No. 490 at 3) commented that the proposed standards, if enacted, would force Maytag to spend millions of dollars at its plants with considerable competitive disadvantage compared to its primary competitors. He said Maytag may have to discontinue lower volume product lines and thus, further reduce competition in the marketplace.

D. Wilson (Frigidaire, No. 544 at 5) commented that the economic impact on the Dalton Microwave Operations would be significant if it needed to redesign its products to meet the proposed DOE requirements. He added that because only a few U.S. companies continue to manufacture this product, the addition of more economic burden will likely cause the remaining smaller manufacturers to close down, allowing the importers to completely take over the market.

Because the Department found in today's rule that standards for microwave ovens are not economically justified, today's rule will not result in any economic hardship.

Microwave Noise at Higher Efficiency

Robert Lagoussie, International Microwave Power Institute (April 7, at 310–313), R.D. Parlow (National Telecommunications and Information Administration, No. 689 at 1), Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 9–10) commented that a microwave oven produces electronic noise outside the normal frequency spectrum of 2,400 to 2,500 MHZ. There can be considerable electronic noise in the 2 to 3 GHz range which affects other devices (broadcast/cellular phone), and more noise is generated as the efficiency of the microwave increases. The International Special Committee on Electromagnetic Interference is considering a new noise

standard this year which would reduce the magnetron noise level requirement from 85 to 99 decibels currently to a new standard of 30 to 40 decibels. Amana Refrigeration, Inc. (No. 347 at 6) commented that the FCC has indicated that future requirements for noise interference will be tightened substantially. Amana said that design changes employed to achieve reduced noise will reduce the unit's efficiency.

The National Telecommunications and Information Administration, submitted comments on behalf of U.S. microwave manufacturers, expressing concern that the Department's interest in increasing microwave oven efficiency may be counterproductive to efforts being made to control radio noise. Increased microwave magnetron efficiency could raise radio noise levels, thereby, increasing the potential for interference (National Telecommunications and Information Administration, No. 689 at 1). The Department finds in today's rule that this design option is not economically justified; therefore, this rule will not cause increased noise.

Manufacturer Impact

In the Proposed Rule, DOE conducted a manufacturer impact analysis using the LBL Manufacturer Impact Model (LBL–MIM) as described in the TSD accompanying the 1994 Proposed Rule. Many comments were received regarding this analysis. In the revised analysis which supported the Draft Report, the Department used a computer model that simulates a hypothetical company to assess the likely impacts of standards on manufacturers and to determine the effects of standards on the industry at large. This model, the Manufacturer Analysis Model (MAM), is described in the TSD. Appendix C provides a broad array of outputs, including shipments, price, revenue, net income, and short- and long-run returns on equity. The ''Output Table'' in Appendix C lists values for all these outputs for the base case and for each of the five standard levels analyzed. It also gives a range for each of these estimates. The base case represents the forecasts of outputs with a range of energy efficiencies which are expected if there are no new or amended standards. A ''Sensitivity Chart'' (TSD, Appendix C) shows how returns on equity would be affected by a change in any one of the nine control variables of the model. The Manufacturer Analysis Model consists of 13 modules. The module which estimates the impact of standards on total industry net present value is version 1.2 of the Government Regulatory Impact Model (GRIM). The GRIM was dated March 1, 1993 and was developed by the Arthur D. Little Consulting Company (ADL) under contract to AHAM, the Gas Appliance Manufacturers Association (GAMA), and the Air-Conditioning and Refrigeration Institute (ARI). (See TSD, Appendix C for more details.) The results of this analysis are reported in section III. c. of today's rule. However, these results were not utilized in coming to the conclusions reported in section III. e. All trial standard levels in today's rule were rejected based on consumer economics. Therefore, a revised manufacturer impact analysis was not necessary.

Rebound Effect

ACEEE (ACEEE, No. 557 at 3) commented that it did not understand DOE's estimate of 10% rebound effect for cooking, because this rebound effect implies that households purchasing efficient ranges and ovens would cook more.

A ten percent rebound effect was not used in the analysis. A rebound effect of less than one percent was used.

Microwave Ovens Not Covered Under NAECA

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 2) argued that nothing in the statutory language of NAECA required or indicated that microwave ovens should fall within the definition of ''kitchen ranges and ovens'' in Section 322(a)(10) as opposed to other covered products.

The Department has previously determined that microwave ovens fall within the definition of ''kitchen ranges and ovens.'' 43 FR 20108 (May 10, 1978).

Baseline Values Incorrect in TSD

Jack Weizeorick and Charles Samuels (AHAM, No. 001 at 7–9) commented that the microwave oven baseline value for shipment weighted average efficiency of 54.5 percent used in the TSD for the Proposed Rule is based on AHAM data of microwave ovens shipped in 1989. More recent shipment data shows a new, higher value of 55.8 percent. ACEEE (ACEEE, No. 557 at 23) commented that DOE should redo its analysis after it reduces the average baseline consumption of ovens and cooktops to be in line with recent data by utilities and GRI. The Department agreed and incorporated the 55.8 percent number into the Draft Report analysis.

Consumer Education Programs

AHAM (No. 001 at 16) stated that two reports indicated significant variations in energy use among consumers preparing identical meals (50 and 60 percent differences respectively). AHAM recommend that DOE establish consumer education programs as a national priority for saving energy, in lieu of mandatory product performance standards. G. Greulich (Whirlpool, Transcript, Apr. 7 at 220) also commented that more emphasis should be placed on consumer education rather than engineering redesign of the ranges. R. Markum (Emerson Electric Co., No. 366 at 5) commented that much more potential energy savings exist through consumer education on the proper methods to achieve maximum cooking efficiency rather than through mandatory efficiency standards. Lyn Cook (Independent Home Economist, No. 749 at 2) commented that informing the consumer on how to make optimal use of energy efficient cooking methods is key to reducing the total amount of energy used. She quoted 18 points from ACEEE's Consumer Guide to Home Energy Savings which demonstrate how significant energy variances can be eliminated. Mark Krebs (Laclede Gas, EE–RM–S–97–700 No. 18 at 2) commented that the goals of energy efficiency and conservation are more likely to be achieved through facilitating consumer education rather than to simply dictate or restrict choices of technology.

The Department is required by statute to promulgate energy efficiency standards for cooking products if economically justified and technically feasible. EPCA, § 325, 42 U.S.C. § 6295. The Department's ENERGY STAR® program helps to educate consumers on the purchase of more energy efficient appliances. The program is increasing continually the list of products the program covers. One of the criteria the program uses to determine which products it should add to the program is an evaluation of whether there is a wide range of energy efficiencies among the products in the marketplace. Because there are not a wide range of efficiencies for cooking products, they have not been added to the Energy Star program thus far.

d. Other Comments Regarding the Draft Report and Supplemental Analysis

Marcia Copeland (Betty Crocker, EE–RM–S–97–700 No. 5 at 1–3) stated that the Draft Report did not address the implication of the changes to the proposed rule on consumers. She also requested DOE provide a glossary of terms.

DOE does analyze the effects of its rulemakings on consumers. For example, the Department abolished the

design option that eliminated the oven door window because of the adverse impact it would have on consumer utility. Because today's rule does not impose additional efficiency requirements on cooking products, the Department concludes that today's rule will not impact consumers.

The first time the Department uses an acronym, the Department spells it out, for example, ''Technical Support Document (TSD)''; then the Department uses the acronym (e.g. TSD) throughout the rest of the document. The Department, however, agrees a glossary is a good suggestion, and the Department will provide a glossary in the TSD.

Electric Non-Self-Cleaning Ovens

In the reopening notice of February 27, 1998, DOE indicated a likelihood of not establishing standards for electric non-self-cleaning ovens. Many commenters supported no standards for electric non-self-cleaning ovens. Whirlpool (Whirlpool, EE–RM–S–97–700 No. 33 at 2) stated that no improved venting or insulation for electric non-self-cleaning ovens would meet all of DOE's minimum economic and utility requirements or its energy savings requirements under NAECA. Whirlpool supported the Department's decision not to establish performance standards for any electric cooking products. Whirlpool (Whirlpool, EE–RM–S–97–700 No. 6 at 1) stated that the cost of compliance testing would be greater than the potential energy savings of the design options. Maytag (Maytag, EE–RM–S–97–700 No. 9 at 4) supported DOE's conclusions regarding venting and insulating improvements on electric non-self-cleaning electric ranges.

AHAM (AHAM, EE–RM–S–97–700 No. 26 at 2) supported DOE's conclusion that no standards are appropriate for microwave ovens or other electric cooking products. AHAM (AHAM, EE–RM–S–97–700 No. 26 at 3) also cited cumulative regulatory burden placed on the manufacturers (due to the refrigerator, room air conditioner, and clothes washer rules) as another reason why standards for cooking products are inappropriate.

Steve Nadel (ACEEE, EE–RM–S–97–700 No. 32 at 2) supported no new standard for electric non-self-cleaning ovens. However, ACEEE disagreed with the rationale that the Department cannot be certain that all products if vented and insulated like self-cleaning counterparts will meet a specific performance standard because DOE can never be sure that a specific design option will always achieve a specific performance level. DOE could perform additional testing, but given the modest savings of a standard, the burden of performance testing, and the fact that the rulemaking is already years behind, public interest is best served by finalizing a ''no standard'' standard for electric products.

Mark Krebs (Laclede Gas, EE–RM–S–97–700 No. 18 at 1) questioned how DOE could state that the record for electric cooking products is complete if performance data on electric ovens does not exist. In the reopening notice of February 27, 1998, however, the Department stated that DOE believed the record was complete for electric cooktops, electric self-cleaning ovens, and microwave ovens. The Department did not state the record was complete for electric non-self-cleaning ovens. The Department issued the February 1998 notice in order to complete the record.

The American Gas Association (AGA, EE–RM–S–97–700 No. 37 at 11–12) commented that the Department has not shown adequate justification for not issuing standards for electric cooking products. AGA commented that the analysis shows a performance standard for electric non-self-cleaning ovens is technologically feasible, economically justified, and will save significant energy. AGA stated that DOE's argument that no performance or usage data exists for these products (therefore it is unknown if they could meet a performance standard with improved insulation & venting) would imply that DOE would not pursue standards for any NAECA products where data did not already exist. The National Propane Gas Association (NPGA, EE–RM–S–97–700 No. 31 at 2) concurred with AGA's comments.

As discussed under ''design options,'' the Department has received information from manufacturers indicating that their self-cleaning and non-self-cleaning ovens typically already use the same venting, and the Department has probably overstated the energy savings. The Department also believes that it has shown adequate justification (see Section ''III. e. Conclusion'') for rejecting standards for electric cooking products.

Separating the Rule

Many commenters requested the Department split off certain products from this rule and finalize the rule for those products immediately. AHAM (AHAM, EE–RM–S–97–700 No. 26 at 2) commented that the electric range and oven and microwave oven portion of this rulemaking should be finalized immediately. AHAM stated that failure to finalize this rule has created uncertainty among manufacturers, component suppliers, and other parties and adversely affects investment and redesign decisions. Amana (Amana, EE–RM–S–97–700 No. 38 at 1) emphasized the importance of finalizing the electric range and microwave oven portions of the rule as soon as possible and separately, if necessary, from the gas cooking products rule. Amana cited the adverse effects the delay has caused on planning and investment. Whirlpool (Whirlpool, EE–RM–S–97–700 No. 33 at 4) stated that it has been waiting eight years for a final rule, which has not allowed them to be completely free to dedicate resources to innovative consumer features, without setting them forth. Consequently, Whirlpool urged DOE to issue a separate rule for electric cooking products immediately.

Sharp (Sharp, EE–RM–S–97–700 No. 35 at 1) fully supported DOE's conclusion that establishing new or revised energy conservation standards for microwave ovens are not technologically feasible or economically justified. Sharp requested that DOE separate microwave ovens from the other consumer products identified in the notice and issue, without delay, a final determination that DOE will not establish any energy conservation standards for microwave ovens. Sharp commented that such a final pronouncement by DOE will remove the lingering uncertainty that has hindered the microwave oven industry.

Due to requests that the rule be split in order to issue a final rule for electric cooking products without further delay, the Department has severed the electric cooking products from the gas cooking products in this rule.

Energy Rates

Commenters recommended that the Department should use the latest energy price forecasts and the Consumer Marginal Energy Rates (CMER) as recommended by the Advisory Committee on Appliance Energy Efficiency Standards (ACAES). Sharp (Sharp, EE–RM–S–97–700 No. 35 at 2) commented that if consumer marginal energy rates were used in the calculations for microwave ovens, it would greatly increase the payback period, which already extends beyond the economically acceptable timeframe. AGA (AGA, EE–RM–S–97–700 No. 37 at 9) also commented that DOE should use the latest AEO price projections and the energy cost recommendations of the ACAES. The National Propane Gas Association (NPGA, EE–RM–S–97–700 No. 31 at 2) concurred with AGA's comments. Edison Electric Institute (EEI, EE–RM–S–97–700 No. 21 at 1) commented that the analysis should be changed to show the results of

calculations over a range of marginal energy prices, which would lead to more accurate ranges of life-cycle-costs, rather than using ''average'' prices. EEI stated that the avoided energy cost rates using AEO 98 are lower than the rates used in the DOE analysis. EEI also commented that discount factors for this type of consumer appliance are probably too low. In addition, EEI commented that if the peak demand savings are assuming 100% coincidence with utility peak demands, 100% diversity, and 100% load factors, then the values are too high and should be adjusted downward to reflect actual coincidence, diversity, and load factors. AHAM (AHAM, EE–RM–S–97–700 No. 26 at 2) also commented that AEO 98 and CMER should be used. AHAM stated that these lower electricity rates would result in even longer paybacks for any possible standard level.

The Department is committed to certain procedures under the Process Rule. 61 FR 36973 (July 15, 1996). These procedures, however, do not apply entirely to certain rules already underway, 61 FR at 36980, including the cooking products rulemaking. The Supplemental Analysis, conducted in 1997, did use the most current energy price forecasts available at that time. In addition, the Advisory Committee had not yet made its recommendations to the Department regarding CMER at the time the Supplemental Analysis was conducted. Furthermore, using these lower energy rates would not increase the likelihood that standards for electric cooking products would be economically justified because lower energy prices would only increase the payback period and decrease the life-cycle-cost savings. Consequently, the Department did not expend the resources to reanalyze the data using these new energy rates. Regarding peak demand savings, the Department agrees with EEI and did not assume 100 percent diversity, coincidence, or load factors. See Appendix E of the General Methodology in the TSD for a more complete explanation.

EEI questioned whether an energy efficiency standard should discuss emissions and environmental impacts. EEI commented that the Draft Report downplays the reductions in sulfur dioxide and nitrogen oxide emissions from power plants, on an overall and per kWh basis, and it does not appear that the report shows a decline in emissions for the years 2001–2030. EEI also stated that the impact of restructured electricity markets could have a significant impact on emissions, as customers choose their preference of generation sources. The Department agrees that forecast emission rates for NO_X, SO_2, and CO_2 do fall over time. Emission rates may be affected by restructuring, but given the absence of clear indications of this effect, it was not incorporated into the analysis.

III. Analysis of Electric Cooking Products Standards

Revised standards for cooking products shall be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. These and related statutory criteria are addressed below.

a. Efficiency Levels Analyzed

The Department examined a range of standard levels for cooking products. Table 4–1 presents the five efficiency levels that had been selected for analysis for the five classes of electric cooking products. Level 5 corresponds to the highest efficiency level, max tech, considered in the engineering analysis. The final TSD contains the information analyzed in the Draft Report and the supplemental analysis.

TABLE 4–1.—ANNUAL ENERGY USE FOR STANDARD LEVELS ANALYZED IN THE PROPOSED RULE FOR KITCHEN RANGES, OVENS AND MICROWAVE OVENS

Product class	Standard level					
	Baseline	1	2	3	4	5
Electric ovens, self-cleaning (kWh)	303.7	303.7	303.7	303.7	220.0	213.7
Electric ovens, non-self-cleaning (kWh)	274.9	263.2	251.8	248.0	169.6	162.4
Microwave ovens (kWh)	143.2	143.2	143.2	143.2	143.2	132.4
Electric cooking top, coil element (kWh)	234.7	234.7	225.2	225.2	222.9	222.9
Electric cooking top, smooth element (kWh)	233.4	233.4	233.4	233.4	233.4	206.4

For analytical purposes the Department segmented the above classes into three groups: conventional ovens, conventional cooking tops, and microwave ovens. Rather than presenting the results for all classes of cooking products in today's notice, the Department selected a class of cooking products as being representative, or typical, of each group of the product, and DOE is presenting the results only for those representative classes. The results for the other classes can be found in the TSD in the same sections as those referenced for the representative class. The results and conclusions for each group are presented separately below.

1. Efficiency Levels Analyzed for Conventional Ovens

The Department selected non-self-cleaning electric ovens as being the representative class of conventional ovens. For non-self-cleaning electric ovens, trial standard level 1 accomplishes energy efficiency improvement from the baseline by reduced venting; level 2 includes improved insulation; level 3 includes improved seals; level 4 provides for a biradiant oven; level 5 includes reduced conduction losses, forced convection, and an oven separator.

For efficiency levels 1–3 of conventional ovens, the calculations are based on the supplemental analysis, using AEO 97 energy price forecasts. Efficiency levels 4–5 of conventional ovens are based on the Draft Report analysis, which used AEO 95 energy price forecasts. They were not reanalyzed in the Supplemental analysis.

2. Efficiency Levels Analyzed for Conventional Cooking Tops

The Department selected electric-coil cooking tops as being representative of conventional cooking tops. For electric-coil cooking tops, trial standard level 1 remains at the baseline while levels 2 and 3 accomplish energy efficiency improvements from the baseline by incorporating improved heating element contact conductance; levels 4 and 5 add reflective surfaces.

Conventional electric cooktops were not addressed in the Supplemental Analysis. Values pertaining to cooktops referenced in today's rule are based on

the Draft Report, which used AEO 95 energy price forecasts.

3. Efficiency Levels Analyzed for Microwave Ovens

The Department considers all microwave ovens to comprise one class. For microwave ovens, trial standard levels 1 through 4 remain at the baseline, while level 5 incorporates an efficient power supply, an efficient fan, an efficient magnetron, and a reflective surface. All values referenced are from the Draft Report, which used AEO 95 energy price forecasts.

b. Significance of Energy Savings

Under section 325(o)(3)(B) of EPCA, the Department is prohibited from adopting a standard for a product if that standard would not result in ''significant'' energy savings. The Department forecasted energy consumption by the use of the Lawrence Berkeley Laboratory—Residential Energy Model (LBL–REM). See Appendix B of the TSD. To estimate the energy savings by the year 2030 due to revised standards, the energy consumption of new cooking products under the base case is compared to the energy consumption of those sold under the candidate standard levels. For the candidate energy conservation standards, the analysis projects that over the period 2001–2030, the following energy savings would result for all classes of the product. See Tables 3.3 and Supplemental Table 3.16b in the TSD.

1. Conventional Ovens

Level 1—0.05 Quad [3]
Level 2—0.10 Quad [3]
Level 3—0.03 Quad [3]
Level 4—1.68 Quad [4]
Level 5—1.68 Quad [4]

2. Conventional Cooking Tops

Level 1—0 Quad
Level 2—0.05 Quad
Level 3—0.05 Quad
Level 4—0.10 Quad
Level 5—0.45 Quad

3. Microwave Ovens.

Level 1—0 Quad
Level 2—0 Quad
Level 3—0 Quad
Level 4—0 Quad
Level 5—0.33 Quad

While the term ''significant'' is not defined in EPCA, the U.S. Court of Appeals for the District of Columbia Circuit concluded that Congress intended the word ''significant'' to mean ''non-trivial.'' *Natural Resources Defense Council* v. *Herrington*. 768 F.2d 1355, 1373 (D.C.Cir. 1985). Thus, for this rulemaking, DOE concludes that each standard level results in significant energy savings.

c. Economic Justification

Section 325(o)(2)(A) of EPCA provides seven factors to be evaluated, to the greatest extent practicable, in determining whether a conservation standard is economically justified.

1. Economic Impact on Manufacturers and Consumers

The engineering analysis identified improvements in efficiency along with the associated costs to manufacturers for each efficiency level for each class of product. For each design option, these associated costs constitute the increased per-unit cost to manufacturers to achieve the indicated energy efficiency levels. Manufacturer, wholesaler, and retailer markups will result in a consumer purchase price higher than the manufacturer cost.

To assess the likely impacts of standards on manufacturers and to determine the effects of standards on different-sized firms, the Department used a computer model that simulates hypothetical firms in the industry under consideration. This model, the Manufacturer Analysis Model (MAM), is explained in the TSD. (See TSD, Appendix C.) The cost of a compliance testing and certification program is an additional impact on the manufacturer. The Department's analysis, however, did not assess the impact of this program on the manufacturers.

For consumers, measures of economic impact are the changes in purchase price, annual energy expense, and installation costs. The purchase price, installation cost, and cumulative annual energy expense, i.e., life-cycle cost, of each standard level are presented in Chapter 3 of the TSD. Under section 325 of the EPCA, the life-cycle cost analysis is a separate factor to be considered in determining economic justification.

Conventional Ovens. The per-unit increased cost to manufacturers to meet efficiency level 1 for electric non-self-cleaning ovens is $1.63; to meet level 2, the manufacturers' cost increase is $4.84; level 3 is $8.53; level 4 is $71.03, and level 5 is $125.94. *See* Technical Support Document, Table 1.11.

At those levels of efficiency, the consumer price increase, for electric non-self-cleaning ovens at level 1 is $3.5; to meet level 2, the cost increase is $11; level 3 is $29; level 4 is $179, and level 5 is $314. For electric non-self-cleaning ovens, the per-unit reduction in annual cost of operation, including energy expenses and any additional maintenance costs, at level 1 is $1[3]; standard level 2 is $2[3]; level 3 is $2[3]; level 4 is $8[4], and level 5 is $8[4]. *See* Technical Support Document, Table 4.4 and Supplemental Table 4.4.

The Lawrence Berkeley Laboratory-Manufacturer Impact Model analyzes the effects of the trial standard levels on both the long run and short run returns on equity. Short run return on equity refer to the effect during approximately the first three years, and long run return on equity refers to the effects beyond three years. The results (analyzed in the Draft Report) for all classes of conventional ovens [5] show that revised standards would have some effect on a prototypical manufacturer's short-run return on equity with some decrease at the higher standard levels from the 10.53 percent in the base case. Standard levels 1 through 5 are projected to produce short-run returns on equity of 10.64 percent, 10.63 percent, 10.21 percent, 8.85 percent, and 5.14 percent, respectively. These standard levels have slight impacts on long-run return on equity. Standard levels 1 through 5 are projected to produce long-run return on equities of 10.51 percent, 10.51 percent, 10.35 percent, 10.33 percent, and 9.75 percent, respectively. *See* Technical Support Document, Tables 5.2 and 5.8.

Conventional Cooking Tops. The per-unit increased cost to manufacturers to meet the level 1 efficiency for electric-coil cooking tops is zero, since this class is at the baseline; to meet levels 2 and 3 the manufacturers' cost increase is $2.28, and to meet levels 4 and 5 the cost is $5.31. *See* Technical Support Document, Table 1.6.

At those levels of efficiency, the consumer price increase, for electric-coil cooking tops at level 1 is unchanged, since it is at the baseline; to meet levels 2 and 3 the cost increase is $5, and at levels 4 and 5 it is $12. *See* Technical Support Document, Table 4.1.

The per-unit reduction in annual cost of operation, including energy expenses and any increase in maintenance cost, for electric-coil cooking tops at level 1 is unchanged since it is at the baseline; standard levels 2 and 3 would reduce operational expenses by $1, and levels 4 and 5 would reduce operational expenses by $1. *See* Technical Support Document, Table 4.1.

The Lawrence Berkeley Laboratory-Manufacturer Impact Model results for

[3] Calculations are based on the supplemental analysis, using AEO 97 energy prices.

[4] Calculations are based Draft Report analysis, which used AEO 95 energy prices. They were not reanalyzed in the Supplemental analysis.

[5] These values, calculated in the Draft Report, were based on all classes of conventional ovens, including gas ovens.

all classes of conventional cooking tops show that revised standards would have slight impacts on a prototypical manufacturer's short-run return on equity [6] with some decrease at the higher standard levels from the 10.84 percent in the base case. Standard levels 1 through 5 are projected to produce short-run return on equities of 11.07 percent, 11.04 percent, 11.08 percent, 11.02 percent, and 9.24 percent, respectively. These standard levels have slight impacts on long-run return on equity, with some decreases at the higher standard levels. Standard levels 1 through 5 are projected to produce long-run returns on equity of 10.77 percent, 10.78 percent, 10.78 percent, 10.42 percent and 9.71 percent, respectively. *See* Technical Support Document, Tables 5.1 and 5.7.

Microwave Ovens. The per-unit increased cost to manufacturers to meet efficiency levels 1 through 4 for microwave ovens is zero since these levels are at the baseline; to meet level 5, the manufacturers' cost increase is $51.11. *See* Technical Support Document, Table 1.17.

At those levels of efficiency, the consumer price increase for microwave ovens at levels 1 through 4 is unchanged since they are at the baseline; to meet level 5, the cost increase is $66. *See* Technical Support Document, Table 4.8.

The per-unit reduction in annual cost of operation at levels 1 through 4 would not reduce annual operational expense since it is at the baseline. Standard level 5 would reduce operational expenses by $1. *See* Technical Support Document, Table 4.8.

The Lawrence Berkeley Laboratory-Manufacturer Impact Model results for microwave ovens show that revised standards would not affect a prototypical manufacturer's long nor short-run return on equity of 3.65 percent in the base case, except for max tech. Standard levels 1 through 5 are projected to produce short-run return on equities of 3.65 percent, 3.65 percent, 3.65 percent, 3.65 percent and 2.30 percent, respectively. Standard levels 1 through 5 are projected to produce long-run return on equities of 3.65 percent, 3.65 percent, 3.65 percent, 3.65 percent and 4.81 percent, respectively. *See* Technical Support Document, Tables 5.3 and 5.9.

2. Life-Cycle Cost and Net Present Value

One measure of the effect of proposed standards on consumers is the change in life-cycle costs, including recurring operating expenses, purchase price, and installation costs resulting from the new standards. The change in life-cycle cost is quantified by the difference in the life-cycle costs between the base case and candidate standard case for each of the product classes analyzed. The life-cycle cost is the sum of the purchase price and the cumulative operating expense, including installation and maintenance expenditures, discounted over the lifetime of the appliance. The life-cycle cost was calculated for the range of efficiencies analyzed in the ''Engineering Analysis'' section of the TSD, for each class, in the year standards are imposed, using real consumer discount rate of six percent.

Conventional Ovens. A life-cycle cost is calculated for a unit meeting each of the candidate standard levels. For the representative class, life-cycle costs for non-self-cleaning ovens at standard levels 1 and 2 are at or less than the baseline unit. Of the five candidate standard levels, units meeting level 2 have the lowest consumer life-cycle cost for electric non-self-cleaning ovens. *See* Technical Support Document, Table 4.4 and Supplemental Table 4.4.

For the representative class of electric ovens, standard level 1 would cause reductions in life-cycle costs for the average consumer of $6.1; [3] standard level 2 would reduce average life-cycle costs by $8.0; [3] standard level 3 would result in an increase of $6.6; [3] level 4 would result in an increase of $88.2; [4] while standard level 5 would result in an increase of $217.1.[4] *See* Technical Support Document, Table 4.18 and Supplemental Table 4.39.

The Department examined the effect of different discount rates (2, 6, and 15 percent) on the life-cycle cost curves. See Figure 4.4, Table 4.4 and Supplemental Table 4.4 in the TSD. Life-cycle cost sensitivity to changes in energy price and equipment price were analyzed. See Figure 4.12, Table 4.12, and Supplemental Table 4.35 in the TSD. This analysis shows that the life-cycle cost minimum using the lowest State energy price occurs at standard level 1 for electric non-self-cleaning ovens but remains at standard level 2 for all other energy prices analyzed.

The Department also calculated paybacks using the energy prices calculated by the Gas Research Institute (GRI). The life-cycle cost minimums resulting from the GRI projections remain unchanged from the analysis using the AEO price forecasts. The payback periods increase slightly for electric non-self-cleaning ovens using the GRI forecasts, but these paybacks remain well within the expected life of the product. Therefore, the GRI prices have no substantial impact on the outcome of the standard levels analyzed.

The net present value analysis, a measure of the net savings to society, indicates that for all classes of conventional electric ovens, standard levels 1–3 would produce a net present value of $0.03 billion [3] to consumers. The corresponding values for levels 4 and 5 result in a negative $2.53 billion and negative $6.23 billion, respectively.[4] *See* Technical Support Document, Table 3.6e and Supplemental Table 3.28b.

Conventional Cooking Tops. A life-cycle cost is calculated for a unit meeting each of the candidate standard levels. For the representative class, life-cycle costs at all standard levels, except at max tech, are less than the baseline unit for electric coil cooktops. Of the five candidate standard levels, units meeting levels 2 and 3 have the lowest consumer life-cycle cost for electric coil cooktops. It should be noted that for another class, electric smooth element cooking tops, units meeting the baseline have the lowest consumer life-cycle costs. *See* Technical Support Document, Tables 4.1 and 4.2.

For the representative class of electric-coil cooking tops, standard level 1 would cause no change in life-cycle costs for the average consumer since it is the same as the baseline; standard levels 2 and 3 would reduce average life-cycle costs by $3.2, and standard levels 4 and 5 would result in an increase in life-cycle cost of $1.8. *See* Technical Support Document, Table 4.15.

The Department examined the effect of different discount rates (2, 6, and 15 percent) on the life-cycle cost curves. If the discount rate is increased to 15 percent, the life-cycle cost minimum occurs at the baseline. See TSD Table 4.1. Life-cycle cost sensitivity to changes in energy price and equipment price were analyzed. See Figure 4.10 and Table 4.10 in the TSD. This analysis shows that the life-cycle cost minimum using the lowest State energy price drops to standard level 1 for electric coil cooktops but remains unchanged for all other energy prices analyzed. The life cycle cost minimum remains unchanged for the highest State energy price, except for the case including both the highest State energy price and the highest equipment price, the LCC minimum occurs at max tech. Consequently, high state energy prices have no effect on the standard levels analyzed unless equipment prices are also high.

The net present value analysis, a measure of the net savings to society, indicates that for all classes of

[6] These values, calculated in the Draft Report, were based on all classes of conventional cooktops, including gas cooktops.

conventional electric cooking tops, standard level 1 would produce a zero net present value; standard levels 2 and 3 would produce a net present value of $0.03 billion, while standard levels 4 and 5 would produce negative net present values of $0.09 billion and $3.10 billion, respectively. See Technical Support Document, Table 3.6b.

Microwave Ovens. A life-cycle cost is calculated for a unit meeting each of the candidate standard levels. Of the five candidate standard levels, units meeting the baseline had the lowest consumer life-cycle cost for microwave ovens. See Technical Support Document, Table 4.8. Standard levels 1 through 4 would cause no reductions in life-cycle costs for the average affected consumer, since they are the same as the baseline for microwave ovens. Standard level 5 would increase average life-cycle costs by $56.7. See Technical Support Document, Table 4.22.

The Department examined the effect of different discount rates (2, 6, and 15 percent) on the life-cycle cost curves and generally found little impact. Life-cycle cost sensitivity to changes in energy price and equipment price were analyzed. See Figure 4.14 and Tables 4.14 in the TSD. This analysis shows little impact.

The net present value analysis, a measure of the net savings to society, indicates that for microwave ovens, standard levels 1 through 4 would produce a zero net present value to consumers. The net present value for level 5 is a negative $4.67 billion. *See* Technical Support Document, Table 3.6g.

3. Energy Savings

EPCA requires DOE to consider the total projected energy savings that result from revised standards. The Department forecasted energy consumption through the use of the LBL–REM. (See Appendix B of the TSD for a detailed discussion of the LBL–REM.) See section III. b. in today's rule for the energy savings of all efficiency levels.

4. Lessening of Utility or Performance of Products

In establishing classes of products and design options, the Department tried to eliminate from consideration any design option that would result in degradation of utility or performance. Thus, a separate class with a different efficiency standard was created for a product where the record indicated that the product included a utility or performance-related feature that affected energy efficiency. Five separate classes were analyzed; see Table 4–1 in today's rule. In this way, the Department attempted to minimize the impact of amended standards on the utility and performance of conventional ovens, conventional cooking tops, and microwave ovens.

5. Impact of Lessening of Competition

The Energy Policy and Conservation Act directs the Department to consider the impact of any lessening of competition that is likely to result from the standards, as determined by the Attorney General.

In a letter dated September 16, 1994, the Department of Justice (DOJ) expressed concern about the effects the standards proposed in the 1994 Proposed Rule might have on industry. DOJ concluded that it is likely that competition in the manufacture and sale of commercial/professional-style or high-end ranges and ovens will be eliminated if the proposed standards are adopted. The Department of Justice also concluded that there is a possibility that the proposed standard could force one or more firms out of the manufacture of standard ranges thus lessening competition. (DOJ, No. 840 at 5.) The September 16, 1994, letter is printed at the end of today's rule.

The Department of Justice comments were based on the standards proposed in the 1994 Proposed Rule. Because today's rule is not promulgating new standards, there will not be significant adverse effects on industry.

6. Need of the Nation To Save Energy

Enhanced energy efficiency improves the Nation's energy security, strengthens the economy, and reduces the environmental impacts of energy production.

7. Other Factors

Decreasing future energy demand as a result of standards will decrease air pollution.

Conventional Ovens.[7] Standards would result in a decrease in nitrogen oxide (NO_X) emissions. For standard level 1, over the years 2000 to 2030, the total estimated NO_X reduction would be approximately 11,000 tons. For standard levels 2–5, the estimated reductions would be approximately 23,000 tons, 15,000 tons, 227,000 tons, and 227,000 tons, respectively.

The estimated decreased need to control SO_X over the years 2000 to 2030 would be 12,000 tons, 25,000 tons, 17,000 tons, and 250,000 tons for levels 1–5, respectively.

Another consequence of the standards would be the reduction of carbon dioxide (CO_2) emissions. For standard level 1, over the years 2000 to 2030, the total estimated CO_2 reduction would be approximately 6 million tons. For standard levels 2–5, the estimated reductions would be 13 million tons, 8 million tons, 126 million tons, and 126 million tons, respectively.

Conventional Cooking Tops.[8] Standards would results in a decrease in nitrogen oxide (NO_X) emissions. For standard level 1, over the years 2000 to 2030, the total estimated NO_X reduction would be zero. During this time period, there would be no reduction of NO_X emissions emitted by power plants. For standard levels 2–5, the reductions would be approximately 9,000 tons, 9,000 tons, 18,000 tons, and 80,000 tons, respectively.

The estimated decreased need to control SO_X over the years 2000 to 2030 would be 11,000 tons, 11,000 tons, 22,000 tons, and 99,000 tons for levels 2–5, respectively.

Another consequence of the standards would be the reduction of carbon dioxide (CO_2) emissions. For standard level 1, over the years 2000 to 2030, the total estimated CO_2 reduction would be zero because this standard level is at the baseline. During this time period, there would be no reduction of CO_2 emissions emitted by power plants in the United States. For standard levels 2–5, the reductions would be approximately 4 million tons, 4 million tons, 8 million tons, and 36 million tons, respectively.

Microwave Ovens: Standards would result in a decrease in nitrogen oxide (NO_X) emissions. For standard levels 1 through 4, over the years 2000 to 2030, the total estimated NO_X reduction would be zero. During this time period, those levels of efficiency improvement would cause no reduction of NO_X emissions from power plants in the

[7] The emissions calculated in the Draft Report Tables 7.6–7.10 were based on both gas and electric ovens. However, from the emissions reductions for standard levels 1 and 2 (for which gas ovens are at the baseline), the emissions reductions per quad can be approximated for electric ovens over the years 2000 to 2030. These approximations are 75 million tons CO_2 per quad, 135,000 tons NO_X per quad, and 150,000 tons SO_2 per quad. Decreases in SO_2 emissions will not occur because the Clean Air Act places a ceiling on SO_2 emissions that will be met under any regulatory regime. Therefore, these reductions should be interpreted as reduced costs to electricity generators for controlling SO_2.

[8] The emissions calculated in the Draft Report Tables 7.1–7.5 were based on both gas and electric cooktops. However, from the emissions reductions for standard level 2 (for which gas cooktops are at the baseline), the emissions reductions per quad can be approximated for electric cooktops over the years 2000 to 2030. These approximations are 80 million tons CO_2 per quad, 180,000 tons NO_X per quad, and 220,000 tons SO_2 per quad. Decreases in SO_2 emissions will not occur because the Clean Air Act places a ceiling on SO_2 emissions that will be met under any regulatory regime. Therefore, these reductions should be interpreted as reduced costs to electricity generators for controlling SO_2.

United States. For standard level 5, the reduction would be 48,000 tons. The highest peak annual reduction of these levels would be 0.08 percent. See Tables 7.11–7.15 in the TSD. Energy associated with these standards would also reduce the costs associated with SO_X compliance [9].

Another consequence of the standards would be the reduction of carbon dioxide (CO_2) emissions. For standard levels 1 through 4, over the years 2000 to 2030, the total estimated CO_2 reduction would be zero. During this time period, there would be no reduction of CO_2 emissions emitted by power plants in the United States. For standard level 5, the reduction would be 25 million tons. The highest peak annual reduction of these levels would be 0.06 percent.

d. Payback Period

If the increase in initial price of an appliance due to a conservation standard would repay itself to the consumer in energy savings in less than three years, then it is presumed that such standard is economically justified.[10] EPCA, § 325(o)(2)(B)(iii), 42 U.S.C. § 6295(o)(2)(B)(iii). This presumption of economic justification can be rebutted upon a proper showing. Failure to qualify for this presumption shall not be taken into consideration in determining whether a standard is economically justified. *Id.*

Conventional Ovens. Table 4–2 presents the payback periods [11] for the efficiency levels analyzed for the representative class of conventional ovens. For electric ovens, none of the trial standard levels satisfies the rebuttable presumption test, i.e., the additional price of purchasing a product will be less than three times the value of the energy savings that the consumer will receive during the first year. See Table 4.18 and Supplemental Table 4.43 in the TSD.

TABLE 4–2.—PAYBACK PERIODS OF DESIGN OPTIONS (YEARS) FOR NON-SELF-CLEANING CONVENTIONAL OVENS

Standard level	Payback period
1	[3] 4.0
2	[3] 6.5
3	[3] 14.5
4	[4] 22
5	[4] 36

Conventional Cooking Tops. Table 4–3 presents the payback periods for the efficiency levels analyzed for the representative class of conventional cooking tops. For electric cooktops, none of the trial standard levels satisfies the rebuttable presumption test, i.e., the additional price of purchasing a product will be less than three times the value of the energy savings that the consumer will receive during the first year. See Table 4.15 in the TSD.

TABLE 4–3.—PAYBACK PERIODS OF DESIGN OPTIONS (YEARS) FOR CONVENTIONAL COOKING TOPS

Standard level	Payback period
1	N/A
2	6.5
3	6.5
4	13
5	13

Microwave Ovens. Table 4–4 presents the payback period for the efficiency levels analyzed for microwave ovens. For microwave ovens, none of the trial standard levels satisfies the rebuttable presumption test, i.e., the additional price of purchasing a product will be less than three times the value of the energy savings that the consumer will receive during the first year. See Table 4.22 in the TSD.

TABLE 4–4.—PAYBACK PERIODS OF DESIGN OPTIONS (YEARS) FOR MICROWAVE OVENS

Standard level	Payback period
1	N/A
2	N/A
3	N/A
4	N/A
5	79

e. Conclusion

1. Product Name Change

The Department is changing the name of this product from ''kitchen ranges and ovens'' to ''cooking products.'' This change is made because the term ''kitchen ranges and ovens'' does not accurately describe the products considered which include microwave ovens, conventional ranges, cooktops, and ovens. To be consistent with this change, the Department is adding a regulatory definition of ''cooking products'' that is the same as the existing definition of ''kitchen ranges and ovens'' to Title 10 CFR Part 430.2.

2. Standards

Section 325(o)(2)(A) of the Act specifies that the Department must establish standards that ''achieve the maximum improvement in energy efficiency which the Secretary determines is technologically feasible and economically justified.'' EPCA, § 325(o)(2)(A). Technologically feasible design options are ''technologies which can be incorporated in commercial products or in working prototypes.'' 10 CFR Part 430, Appendix A to Subpart C, 4(a)(4)(i). A standard level is economically justified if the benefits exceed the burdens. EPCA, § 325(o)(2)(B)(i).

A maximum technologically feasible (max tech) design option was identified for each class of cooking products. The max tech levels were derived by adding energy-conserving engineering design options to the baseline units for each of the respective classes in order of decreasing consumer payback. A complete discussion of each max tech level, and the design options included in each, is found in the *Engineering Analysis* in the TSD, Chapter 1. Table 5–1 presents the Department's max tech performance levels for all classes of the subject products:

TABLE 5–1.—COOKING PRODUCTS MAXIMUM TECHNOLOGICALLY FEASIBLE LEVELS

Product class	Annual energy use
Electric oven, self-cleaning	213.7 kWh.
Electric oven, non-self-cleaning	162.4 kWh.
Microwave oven	132.4 kWh.
Electric cooktop, coil element	229.9 kWh.
Electric cooktop, smooth element	206.4 kWh.

[9] Decreases in SO_2 emissions will not occur because the Clean Air Act places a ceiling on SO_2 emissions that will be met under any regulatory regime. Therefore, these reductions should be interpreted as reduced costs to electricity generators for controlling SO_2. For microwave ovens at standard levels 1 through 4, over the years 2000 to 2030, the total estimated SO_2 reduction would be zero. For standard level 5, the need to control SO2 would be reduced by an estimated 53,000 tons.

[10] For this calculation, the Department calculated cost-of-operation based on the DOE test procedures. Therefore, the consumer is assumed to be an ''average'' consumer as defined by the DOE test procedures. Consumers who use the products less than the test procedure assumes will experience a longer payback while those who use them more than the test procedure assumes will have a shorter payback.

[11] These payback periods are weighted averages. They compare the portion of the projected distributions of designs in the base case that are less efficient than the standard level to the design at the standard level. Designs with energy consumption at or below the standard level are not affected by the standard and are excluded from the calculation of impacts.

Accordingly, DOE first considered the max tech level of efficiency, i.e., standard level 5.

Conventional Ovens[12]. Of the standard levels analyzed, level 5 will save the most energy (1.68 quads between 2000 and 2030). In order to meet this standard, the Department assumes that the representative class of conventional ovens will incorporate improved door seals, reduced venting, increased and improved insulation, forced convection, an oven separator, would be biradiant and have reduced conduction losses. However, the payback at this standard level of 36 years for the representative class exceeds the 19-year product life. At this standard level, all classes have increased life-cycle costs and negative net present value. The Department therefore concludes that the burdens of standard level 5 for conventional ovens outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 4. This standard level is projected to save 1.68 quads of energy. In order to meet this standard, the Department assumes that the representative class of conventional ovens will incorporate improved door seals, reduced venting, increased and improved insulation, and would be biradiant. However, for the representative class the payback at this standard level is 22 years. This standard level increases the life-cycle costs for both classes of electric ovens. In addition, this standard level results in a negative net present value for all classes of conventional ovens. The Department therefore concludes that the burdens of standard level 4 for conventional ovens outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 3. This standard level is projected to save 0.03 quad of energy. In order to meet this standard, the Department assumes that all conventional electric ovens incorporate improved door seals, reduced venting, and improved insulation. The payback at this standard level is 14 years. This standard level increases the life-cycle costs for the representative class of electric ovens. The Department therefore concludes that the burdens of standard level 3 for conventional ovens outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 2. In the Supplemental Analysis prepared in Fall 1997, standard level 2 was projected to save 0.1 quad of energy. In order to meet this standard, the Department assumes that the representative class of conventional ovens will incorporate reduced venting and improved insulation. However, the savings estimates the Department used were based on the assumption that efficiency gains could be achieved by reducing the vent rate and improving the type of insulation used. As discussed in section ''II. Discussion of Comments, reduced vent size'' the Department has determined that there may not be energy savings from reduced venting. Thus, in order to evaluate the energy savings and consumer impacts of improved insulation only, the Department has considered the incremental differences between trial standard level 1 (which consisted of reduced venting) and trial standard level 2 (which adds improved insulation). Thus, standard level 1 essentially becomes the baseline for this evaluation. Excluding the effects of reduced venting on standard level 2 lowers the energy savings from the reported 0.1 quad to approximately 0.05 quad, reduces the life-cycle cost savings from the reported $6 to approximately to $2, and increases the payback to from the reported 6.5 years to approximately 9 years (compared to the expected life of 19 years). Additionally, because currently ovens are not labeled or tested for energy consumption and therefore performance data on specific ovens does not exist, it is unknown whether all non-self-cleaning electric ovens would meet a specific performance standard by the addition of insulation alone. Consequently, there is a risk that in order to bring some electric non-self-cleaning ovens into compliance with a performance standard, manufacturers would need to use additional design options. The analysis found no other design options to be cost effective. The additional cost would be passed on to consumers. DOE could perform additional testing on electric non-self-cleaning ovens, but given the modest savings (.05 quad), the burden of performance and a certification program, as well as the adverse manufacturer and consumer impacts for ovens that might not achieve a performance standard by using insulation alone, DOE concluded that the burdens of standard level 2 outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 1. In the Supplemental Analysis prepared in Fall 1997, standard level 1 was projected to save 0.05 quad of energy. In order to meet this standard, the Department assumes that the representative class of conventional ovens will incorporate reduced venting. As discussed in the ''comments'' section, the Department has determined that there would likely not be any energy savings from standard level 1. Therefore, the Department rejects standard level 1.

Conventional Cooking Tops[13]. Of the standard levels analyzed, level 5 will save the most energy (0.45 quad between 2000 and 2030). In order to meet this standard, the Department assumes that the representative class of conventional cooking tops will have reflective surfaces and would have improved element contact conductance. At this standard level, all classes have increased life-cycle costs and negative net present value. The Department therefore concludes that the burdens of standard level 5 for conventional cooktops outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 4. This standard level is projected to save 0.1 quad of energy. In order to meet this standard, electric-coil cooking tops would have improved element contact conductance and reflective surfaces. However, this standards level results in a negative net present value and increased life-cycle costs for the representative class of conventional cooktops. The Department therefore concludes that the burdens of standard level 4 for conventional cooktops outweigh the benefits, and DOE rejects the standard level.

The next most stringent standard level is standard level 3. In order to meet this standard, electric-coil cooking tops would have improved element contact conductance. This standard level is projected to save the average consumer approximately $3 over the life of the product, using AEO 95 energy price forecasts. This standard level is projected to save 0.05 quad of energy; however, the Department has concerns as to whether this energy saving will be realized. Cooktops are somewhat unique in that they are completely controlled by the consumer. They are not thermostatically controlled, as are refrigerators, nor do they operate in a cyclical mode like a dishwasher. They are operated for an amount of time determined by the consumer to complete a cooking task. Given the small relative efficiency improvement of this design level, 4.3 percent, the

[12] Standard levels 1–3 were reanalyzed in the Supplemental Analysis (which used AEO 97 energy forecasts), and standard levels 4–5 were not reanalyzed and are based solely on the Draft Report, using AEO 95.

[13] Cooktops and microwave ovens were not reanalyzed in the Supplemental Analysis, therefore they are based solely on the Draft Report, using AEO 95 energy forecasts.

savings would only be realized if consumers reduced their cooking times by 4.3 percent. While this is theoretically possible, especially for cooking tasks that have a possible definite end point such as boiling water or melting butter which would occur 4.3 percent faster, it seems highly questionable that consumer behavior would change for the majority of cooking tasks to perform them in 4.3 percent less time. The savings do not occur unless this consumer behavior change takes place. Given the questionable nature of the energy savings, the Department believes that the burdens of a testing and certification program and the possible manufacturer impacts for cooktops that might not achieve a performance standard outweigh the benefits of the standard. The Department concludes that the burdens of standard level 3 for conventional cooktops outweigh the benefits, and DOE rejects the standard level.

Standard level 2 is identical to standard level 3 for electric cooktops, and standard level 1 is at the baseline. Consequently, the Department is not issuing a standard for conventional cooktops because the burdens outweigh the benefits for all standard levels analyzed.

Microwave Ovens [13]. Of the standard levels analyzed, level 5 will save the most energy (0.33 quad between 2000 and 2030). In order to meet this standard, the Department assumes that all microwave ovens will incorporate reflective surfaces and more efficient power supplies, fans, and magnetrons. However, the payback at this standard level of 79 years exceeds the 10-year product life. In addition this level produces increased life-cycle costs and a negative net present value. The Department therefore concludes that the burdens of standard level 5 for microwave ovens outweigh the benefits, and DOE rejects the standard level.

Standard levels 1 through 4 are at the baseline. The Department is not issuing a standard for microwave ovens because the burdens outweigh the benefits for all standard levels analyzed.

After carefully considering the analysis, the Department is not issuing a standard for electric cooking products because the Department believes the burdens outweigh the benefits for all standard levels and all classes of these products.

IV. Procedural Issues and Regulatory Review

a. Review Under the National Environmental Policy Act

In issuing the proposed rule, the Department prepared an Environmental Assessment (EA) (DOE/EA–0819) that was published within the Technical Support Document for the Proposed Rule. (DOE/EE–0009, November 1993.) The environmental effects associated with various standard levels were found to be not significant, and a Finding of No Significant Impact (FONSI) was published. 59 FR 15869 (April 5, 1994). Because the Department is not issuing now a new standard for these products, there are no environmental impacts associated with today's rule.

b. Review Under Executive Order 12866, ''Regulatory Planning and Review''

Today's rule has been determined not to be a ''significant regulatory action,'' as defined in section 3(f) of Executive Order 12866, ''Regulatory Planning and Review'' (58 FR 51735), and has not been reviewed by the Office of Management and Budget.

c. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act 081980 (Pub. L. 96–354), 5 U.S.C. 601 *et seq.*, requires an assessment of the impact of regulations on small businesses unless an agency certifies that the rule will not have a significant economic impact on a substantial number of small businesses and other small entities. Because the Department is not issuing a new standard, this final rule will not have significant economic impact on manufacturers of cooking products. DOE certifies that today's final rule will not have a significant economic impact on a substantial number of small entities.

d. Review Under the Paperwork Reduction Act

No new information or record keeping requirements are imposed by this rulemaking. Accordingly, no Office of Management and Budget clearance is required under the Paperwork Reduction Act. 44 U.S.C. 3501 *et seq.*

e. Review Under Executive Order 12988, ''Civil Justice Reform''

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 Executive 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. With regard to the review required by section 3(a), 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 reviewed today's final rule under the standards of section 3 of the Executive Order and determined that, to the extent permitted by law, the final regulations meet the relevant standards of Executive Order 12988.

f. ''Takings'' Assessment Review

It has been determined pursuant to Executive Order 12630, ''Governmental Actions and Interference with Constitutionally Protected Property Rights,'' 53 FR 8859 (March 18, 1988) that this regulation would not result in any takings which might require compensation under the Fifth Amendment to the United States Constitution.

g. Federalism Review

Executive Order 12612, ''Federalism,'' 52 FR 41685 (October 30, 1987) requires that regulations, rules, legislation, and any other policy actions be reviewed for any substantial direct effect on States, on the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among various levels of government. If there are sufficient, substantial direct effects, then Executive Order 12612 requires preparation of a federalism assessment to be used in all decisions involved in promulgating and implementing a regulation or a rule. The Department finds that this final rule will not have a substantial direct effect on State governments.

h. Review Under the Unfunded Mandates Reform Act

With respect to a proposed regulatory action that may result in the expenditure by state, local, and tribal governments, in the aggregate, or the private sector of $100 million or more in any one year, section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires a Federal agency to publish estimates of the resulting costs, benefits and other effects on the national economy. 2 U.S.C. 1532(a), (b). Under section 205 of UMRA, the Department is obligated to identify and consider a reasonable number of regulatory alternatives before promulgating a rule for which a written statement under section 202 is required. DOE is required to select from those alternatives the most cost-effective and least burdensome alternative that achieves the objectives of the rule unless DOE publishes an explanation for doing otherwise or the selection of such an alternative is inconsistent with law. This final rule does not impose a Federal mandate on State, local, or tribal governments or on the private sector.

i. Review Under the Small Business Regulatory Enforcement Fairness Act of 1996

Consistent with Subtitle E of the Small Business Regulatory Enforcement Fairness Act of 1996, 5 U.S.C. 801–808, DOE will submit to Congress a report regarding the issuance of today's final rule before the effective date set forth in the outset of this notice. The report will state that it has been determined that this rule is not a ''major rule'' as defined by 5 U.S.C. 804(a).

V. Department of Justice Views on the Proposed Rule.

September 16, 1994

Honorable Christine A. Ervin
Assistant Secretary for Energy Efficiency, and Renewable Energy, United States Department of Energy, Forrestal Building, 1000 Independence Ave., S.W., Washington, D.C. 20585

Dear Ms. Ervin:

By letter dated March 14, 1994, the Department of Energy (''DOE'') transmitted to the Attorney General a Notice of Proposed Rulemaking (59 FR 10464) addressing energy standards for eight classes of household appliances. Those classes are: room air conditioners, water heaters, direct heating equipment, mobile home furnaces, kitchen ranges and ovens, pool heaters, fluorescent lamp ballasts and television sets. Section 325 of the Energy Policy and Conservation Act, as amended in 1992 (42 U.S. C. 6295), (''the Act:) requires the Attorney General to determine the impact, if any, of any lessening of competition likely to result from the proposed standards. This letter contains the competitive impact determination of the Department of Justice. (''Department'')

Summary

The evidence available to the Department does not indicate that any significant lessening of competition is likely to result from the imposition of the proposed standards for mobile home furnaces and pool heaters contained in the Notice. For television sets, fluorescent lamp ballasts and professional-style or high-end kitchen ranges it is the Department's judgement based on the available evidence that significant anticompetitive effects are likely to occur. For electric water heaters the evidence indicates that a significant anticompetitive effect could take place if sufficient time is not permitted firms to develop, produce and market products complying with the new standard. For microwave ovens, oil-fired water heaters, room air conditioners, and direct heating equipment the evidence indicates that anticompetitive effects could result; the Department is unable on the basis of the available evidence to determine whether such effects are likely. Finally, the evidence indicates that the cumulative effects of these and other regulatory standards could be to lessen competition in certain markets for household appliances.

In preparing these comments the Department has considered the Notice, the Technical Support Document (TSD) prepared by Lawrence Berkeley Laboratory, written comments and oral comments collected by the department in the time allowed and without the benefit of compulsory process.

Discussion

Adoption of standards requiring greater energy efficiency in household appliances could affect competition in a number of ways. First, by raising the cost of appliances and reducing design and feature choices, standards may lower demand. If standards impose costs on manufacturers that can not be passed to consumers they can lower manufacturers' rates of return. Either one or both of these effects could cause manufacturers to exist the market with the effect of lessening competition and raising prices. Second, imposition of standards may lessen or discourage competition in the design and development of new product features or technologies; such competition benefits consumers and the economy.

The record in this proceeding raises many factual issues relating, among other things, to the technical feasibility of certain standards, their economic impact on manufacturers and consumers and consumer reaction to the changes in products that they might require. In numerous instances, industry representatives and technical consultants retained by them have challenged assumptions and conclusions in the Notice and TSD. The Department is not in a position to resolve many of these contested issues on the basis of the available record. Accordingly, in some instances, the Department is unable to reach a conclusion about the impact of the proposed standards on competition.

Fluorescent Lamp Ballasts

One technical issue that has been raised is whether the proposed standards for fluorescent lamp ballasts are attainable with currently available technology. Numerous ballast manufacturers assert that in many instances they are not. The Department concludes that the doubts raised about the technical feasibility of the standards are serious and affect a substantial number of ballast classes. Thus, if the proposed standards were adopted some or all manufacturers would likely have to cease the production of many products and competition in the sale of those products would cease or diminish.

Television Sets and Related Technologies

1. The weight of available evidence is that adoption of the proposed standard for television sets could force all or many manufacturers to revise their products to lessen the number and quality of their features. Many in the industry contend that the only way to produce products that will comply with the standard would be to reduce or eliminate features that consume electricity such as brighter pictures, remote control, picture-in-picture, improved sound and in-set program guides and other features presently being developed. Development and marketing of product improvements and new features has been an important factor driving competition in the market for television sets. Reducing or retarding the development of such features could substantially reduce demand for sets, retard development and refinement of technology, and reduce utility of the product.

Manufacturers might attempt to circumvent the proposed standard by letting features ''migrate''—incorporating them in units to be sold separately or packaged with television sets. It is claimed that disaggregating features in this manner will decrease overall television energy efficiency. There is evidence that it could also lessen competition because the development and marketing of features in such attached units could be costly and cumbersome, among other things encountering receivers that receive cable signals.

There is evidence that the proposed standard for television sets could affect competition in other markets. Representatives of the television industry assert that as the ''Information Highway'' develops television manufacturers intend to expand the capabilities of their products to include new features to enable them to serve as in-home devices for data transmission and communication. They argue that the TV receiver, already located in virtually every American home, could be a uniquely efficient vehicle for the introduction of new data-processing and communication devices. The Department does not make final judgement on this contention but does conclude that, given the apparent difficulties in the marketing of new features as part of attached units, the standard is likely to retard the development of technology and inhibit the ability of television manufacturers to compete with computer manufacturers and other in the development of new technologies and features for the Information Highway.

Professional-Style and Standard Ranges

The Notice proposes a single set of standards for gas ovens and cooking tops in household ranges. There is substantial evidence that one category of home range cannot be manufactured to meet these proposed standards without losing so much of its distinct characteristics that it is no longer marketable. Professional-style or high-end ranges are products designed to provide some of the performance characteristics of professional or restaurant ranges for home kitchens. Some of these characteristics which differentiate them from standard kitchen ranges, such as high performance burners and ovens, involve considerably more energy consumption than do standard ranges; the special uses and appeal of these products, and their premium in price, depends in good measure on these features. Representatives of the range industry assert that high-end ranges cannot be modified to comply with the proposed standards without giving up so much of the special features of the product that they are no longer marketable. The Department concludes that it is likely that competition in the manufacture and sale of these products will be eliminated if the proposed standards are adopted.

While not as strong as the evidence relating to professional style ranges there is evidence challenging the conclusions in the TSD that the proposed standards for standard gas and electric range ovens and cooking tops will not require significant retooling or redesign and will have not more than minimal impact on manufacturers' long run rates of return on equity. The Association of Home Appliance Manufacturers contends that the standard could have a destructive impact on the range industry. It and various range manufacturers claim that design options suggested in the TSD are not effective and that compliance would require substantial investment in redesign and retooling. The Association also insists that suppliers of equipment and technology necessary to comply may not be able to respond simultaneously and evenly to range manufacturers, a problem that could impose a competitive handicap on some range manufacturers.

A range manufacturer has commented that compliance with the standard cold seriously weaken it and its ability to compete. There is also evidence that the cumulative costs of compliance with this standard and with other and future appliance standards could induce or force ''full line'' appliance manufacturers to exit one or more of the markets that they serve. The range market is concentrated and, while there is conflicting evidence, the Department concludes that there is a possibility that this proposed standard could force one or more firms out of the manufacture of standard ranges thus lessening competition.

Microwave Ovens

The Notice and the TSD conclude that the proposed standard for microwave ovens will not involve any substantial redesign or retooling by manufacturers and will have little impact on their long run returns on equity. Representatives of the industry strongly challenge these conclusions. For example, a representative of MCD Corporation has testified that compliance with the standard would require that her company, a manufacturer of microwaves, make large investments in retooling, and would threaten its viability. The Association of Home Appliance Manufacturers contends that the standard will in all likelihood eliminate all U.S. Production of microwaves and concentrate U.S. sales in the hands of one or two companies. The Department is not in a position to resolve all of the contested technical and financial issues but concludes that this proposed standard could force some significant producers from this concentrated market and substantially lessen competition in it.

Room Air Conditioners

The Notice and TSD conclude that this proposed standard will not involve substantial redesign or retooling and, while it may produce some reductions in the short run, will have little or no effect on manufacturers' long run returns on equity. This conclusion has been challenged by firms in the industry. There is evidence that some of the design options suggested in the Notice are less effective and more costly than the TSD assumes and that manufacturers may, among other things, need to redesign the chassis of some classes to comply with the standard. Such redesigns could add to unit installation costs, make units larger and more cumbersome to install, and otherwise depress demand. There is evidence that at least one product, the five thousand BTU unit, may cease to be manufactured if the standard is adopted. There are also unresolved issues about such matters as the availability and efficacy of some design options suggested in the TSD. The Department is not able to resolve these issues but concludes that the standard could have a substantial negative impact on demand and rates of return, and cause one or more firms to cease the manufacture and sale of some of these products, thus lessening competition.

Direct Heating Equipment

Manufacturers of direct heating equipment contend that this standard will seriously depress demand for their product and likely force some, perhaps all, manufacturers out of this business. Among other things, they contend that the TSD substantially underestimates the added costs of manufacture, and also the added installation costs for venting and wiring, that will be required. They insist that consumer cost increases will seriously depress demand for their product and that their profit margins will suffer because it will be impossible to pass on much of the increased manufacturing costs to consumers. The Department cannot resolve many of these issues but concludes that there is a possibility that several of the five companies that account for most of the production of these products might exit the market if the standard is adopted thus substantially lessening competition.

Water Heaters

Manufacturers of oil-fired heaters content that the proposed standard for their product class would threaten the survival of the product, likely forcing all or most producers out of this business. Some claim that it may not be possible with presently available technology to design and manufacture a product that would comply. Manufacturers assert that the added costs of producing a product in compliance with the standard would, in any event, be considerably higher than the TSD indicates and that increases in price would very seriously depress consumer demand for this product. Five firms, two of them Canadian producers, account for most of the sales of this product in the U.S. The Department is not able to resolve all the questions raised regarding this standard; it concludes that there is at least a possibility that the standard might force one or more of these competitors to exist the U.S. market. Another firm has been taking steps to enter the oil-fired water heater market; adoption of the standard may deter it from doing so. The loss of one such firm could result in a substantial lessening of competition.

DOE's proposed standard for electric water heaters would, in effect, require that such products have an integral heat pump. DOE concedes that this would involve major changes and might cause one or more existing firms to cease the marketing of electric water heaters but believes that other firms such as air conditioner manufacturers may begin producing electric water heaters as a result of the standard. There are complex and unresolved issues as to what would happen to demand for electric water heaters if consumers were required to purchase heat pumps with them. It seems clear that the price of such units will be considerably higher than that of the electric resistance heaters that the standard would remove from the market, but the range of future prices, costs of installation and maintenance and degree of consumer acceptance of a product that has not been widely accepted until now are very difficult to predict. Heat pump water heaters may be useful and economically attractive to many consumers but serious issues have been raised in this proceeding as to whether certain kinds of consumers, such as households with relatively little demand for hot water, will derive a benefit from the product.

Even if the heat pump water heater is eventually widely accepted in the market the Department has concluded that it is likely that competition will be adversely affected for some period of time if adequate time is not permitted for the phasing in of the standard. Three millions units or more of electric resistance units are now sold annually in the U.S. Only a few thousand heat pump units are now produced annually in this country, by two firms. It could take a considerable time for other firms to design new product lines and being substantial ne production capacity on line. there is also evidence from those with experience with the product that heat pump water heaters require special maintenance and servicing. Considerable time may be required for firms to develop and train adequate distribution and service networks if they are to compete effectively. If adequate time for phasing in the standard is not allowed, for a considerable period of time there could be fewer companies competing effectively in the electric water heater business than there are now, and competition in this concentrated market could be substantially lessened.

Cumulative Effects of Regulation

Many of the manufacturers of appliances subject to the proposed standards manufacture several different types of appliance, each subject to those standards or to others authorized by the Act. As indicated above, there is evidence that compliance with some of these standards may require manufacturers to make considerable investments. It is anticipated that future standards for other appliances could require manufacturers to make similar investments. Full-line manufacturers such as General Electric, Whirlpool, Frigidaire, Amana and Maytag could thus be required to make changes in several product lines.

As the TSD recognizes, it is difficult for manufacturers to pass redesign and retooling costs on to consumers. And the impact of a single product redesign may fall more heavily on firms with small shares of the market since they must write off their costs against less sales volume. There is some evidence that firms, particularly the smaller ones, facing the prospect of repeated redesigns involving several different products, may be induced to cease manufacturing one or more of such product lines. Thus to a degree that we can not fully assess there is a possibility that the cumulative effect of these and future energy efficiency standards could be to lessen competition in one or more home appliance markets.

Sincerely yours,

Anne K. Bingaman,

Assistant Attorney General.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Energy Conservation, Household appliances.

Issued in Washington, D.C., on July 22, 1998.

Dan W. Reicher,

Assistant Secretary, Energy Efficiency and Renewable Energy

For the reasons set forth in the preamble Part 430 of Chapter II of Title 10, Code of Federal Regulations, is amended 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 430.2 of Subpart A is amended by removing the definitions for ''kitchen ranges and ovens'' and ''other kitchen ranges and ovens'' and adding, in alphabetical order, the definitions for ''cooking products'' and ''other cooking products'' to read as follows:

Subpart A—General Provisions

§ 430.2 Definitions.

* * * * *

Cooking products means consumer products that are used as the major household cooking appliances. They are designed to cook or heat different types of food by one or more of the following sources of heat: gas, electricity, or microwave energy. Each product may consist of a horizontal cooking top containing one or more surface units and/or one or more heating compartments. They must be one of the following classes: conventional ranges, conventional cooking tops, conventional ovens, microwave ovens, microwave/conventional ranges and other cooking products.

* * * * *

Other cooking products means any class of cooking products other than the conventional range, conventional cooking top, conventional oven, microwave oven, and microwave/conventional range classes.

* * * * *

3. Section 430.32 of Subpart C is amended by revising paragraph (j) to read as follows:

§ 430.32 Energy conservation standards and effective dates.

* * * * *

(j) Cooking Products. Gas cooking products with an electrical supply cord shall not be equipped with a constant burning pilot light. This standard is effective on January 1, 1990.

* * * * *

[FR Doc. 98–23886 Filed 9–4–98; 8:45 am]

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