

TABLE II.85.—DEHUMIDIFIERS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON A SEVEN-PERCENT DISCOUNT RATE

Candidate standard level	≤25.00		25.01–35.00		35.01–45.00		45.01–54.00		54.01–74.99		≥75.00		ALL
	EF	NPV @ 7% billion 2006\$	EF	NPV @ 7% billion 2006\$	EF	NPV @ 7% billion 2006\$	EF	NPV @ 7% billion 2006\$	EF	NPV @ 7% billion 2006\$	EF	NPV* @ 7% billion 2006\$	NPV @ 7% billion 2006\$
1	1.10	0.01	1.25	0.02	1.35	0.01	1.45	0.01	1.55	0.02	2.38	0.00	0.08
2	1.20	0.05	1.30	0.06	1.40	0.03	1.50	0.03	1.60	0.05	2.50	0.00	0.21
3	1.25	0.05	1.35	0.07	1.45	0.04	1.55	0.04	1.65	0.10	2.55	0.00	0.31
4	1.30	0.04	1.40	0.07	1.50	0.03	1.60	0.04	1.70	0.11	2.60	0.00	0.31
5	1.38	0.05	1.45	0.08	1.74	0.00	2.02	0.21	1.80	0.19	2.75	0.00	0.54

* NPV greater than zero but less than \$0.005 billion.

TABLE II.86.—DEHUMIDIFIERS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON A THREE-PERCENT DISCOUNT RATE

Candidate standard level	≤25.00		25.01–35.00		35.01–45.00		45.01–54.00		54.01–74.99		≥75.00		ALL
	EF	NPV @ 3% billion 2006\$	EF	NPV @ 3% billion 2006\$	EF	NPV @ 3% billion 2006\$	EF	NPV @ 3% billion 2006\$	EF	NPV @ 7% billion 2006\$	EF	NPV* @ 3% billion 2006\$	NPV @ 3% billion 2006\$
1	1.10	0.04	1.25	0.04	1.35	0.04	1.45	0.04	1.55	0.06	2.38	0.00	0.22
2	1.20	0.11	1.30	0.14	1.40	0.09	1.50	0.09	1.60	0.12	2.50	0.01	0.57
3	1.25	0.13	1.35	0.20	1.45	0.13	1.55	0.14	1.65	0.27	2.55	0.01	0.87
4	1.30	0.12	1.40	0.21	1.50	0.14	1.60	0.16	1.70	0.32	2.60	0.01	0.96
5	1.38	0.15	1.45	0.25	1.74	0.19	2.02	0.66	1.80	0.55	2.75	0.01	1.81

Tables II.87 and II.88 show the NPV analyzed for cooktops and ovens, results for the candidate standard levels respectively.

TABLE II.87.—COOKTOPS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON SEVEN-PERCENT AND THREE-PERCENT DISCOUNT RATES

Candidate standard level	Electric coil			Electric smooth			Gas		
	EF	NPV @ 7% billion 2006\$	NPV @ 3% billion 2006\$	EF	NPV @ 7% billion 2006\$	NPV @ 3% billion 2006\$	EF	NPV @ 7% billion 2006\$	NPV @ 3% billion 2006\$
1	0.769	0.05	0.18	0.753	-7.48	-14.28	0.399	0.29	0.67
2 .....	.....	.....	.....	.....	.....	.....	0.420	-0.65	-0.98

TABLE II.88.—OVENS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON SEVEN-PERCENT AND THREE-PERCENT DISCOUNT RATES

Candidate standard level	Elec standard			Elec self-clean			Gas standard			Gas self-clean		
	EF	NPV @ 7% billion 2006\$	NPV @ 3% billion 2006\$	EF	NPV @ 7% billion 2006\$	NPV @ 3% billion 2006\$	EF	NPV 2 @ 7% billion 2006\$	NPV @ 35 billion 2006\$	EF	NPV 2 @ 7% billion 2006\$	NPV 2 @ 3% billion 2006\$
1*	0.1113	0.06	0.17	0.1102	-0.28	-0.53	0.0536	0.10	0.24	0.0625	-0.01	0.18
2	0.1163	0.08	0.27	0.1123	-2.87	-5.41	0.0566	0.11	0.34	0.0627	-0.12	0.02
3	0.1181	0.03	0.19	.....	.....	.....	0.0572	0.11	0.34	0.0632	-0.14	-0.05
4	0.1206	-0.81	-1.39	.....	.....	.....	0.0593	-0.33	-0.45	.....	.....	.....
5	0.1209	-0.88	-1.52	.....	.....	.....	0.0596	-0.36	-0.50	.....	.....	.....
6 .....	.....	.....	.....	.....	.....	.....	0.0600	-0.42	-0.62	.....	.....	.....
1a* .....	.....	.....	.....	.....	.....	.....	0.0583	0.35	0.92	.....	.....	.....

* For gas standard ovens, candidate standard levels 1 and 1a correspond to designs that are utilized for the same purpose—eliminate the need for a standing pilot—but the technologies for each design are different. Candidate standard level 1 is a hot surface ignition device while candidate standard level 1a is a spark ignition device. Candidate standard level 1a is presented at the end of the table because candidate standard levels 2 through 6 are derived from candidate standard level 1.

Tables II.89 shows the NPV results for the candidate standard levels analyzed for microwave ovens.

TABLE II.89.—MICROWAVE OVENS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON SEVEN-PERCENT AND THREE-PERCENT DISCOUNT RATES

Candidate standard level	EF	NPV	
		7% Discount rate billion 2006\$	3% Discount rate billion 2006\$
1	0.586	- 1.40	- 2.48
2	0.588	- 3.52	- 6.51
3	0.597	- 6.58	- 12.28
4	0.602	- 10.35	- 19.40

Table II.90 shows the NPV results for the candidate standard levels analyzed for CCWs.

TABLE II.90.—COMMERCIAL CLOTHES WASHERS: CUMULATIVE NET PRESENT VALUE RESULTS BASED ON SEVEN-PERCENT AND THREE-PERCENT DISCOUNT RATES

Candidate standard level	MEF/WF	NPV	
		7% Discount rate billion 2006\$	3% Discount rate billion 2006\$
1	1.42/9.50	0.04	0.20
2	1.60/8.50	- 0.09	0.22
3	1.72/8.00	0.23	0.99
4	1.80/7.50	0.49	1.64
5	2.00/5.50	1.41	3.87
6	2.20/5.10	1.77	4.74

J. Life-Cycle Cost Subgroup Analysis

The LCC subgroup analysis evaluates impacts of standards on identifiable groups of customers, such as different population groups of consumers or different business types, which may be disproportionately affected by any national energy efficiency standard level. In the NOPR phase of this rulemaking, DOE will analyze the LCCs and PBP for customers that fall into such groups. The analysis will determine whether any particular group of consumers would be adversely affected by any of the trial standard levels.

Also, DOE plans to examine variations in energy prices and energy use that might affect the NPV of a standard for customer sub-populations. To the extent possible, DOE will obtain estimates of the variability of each input parameter and consider this variability in the calculation of customer impacts. Variations in energy use for a particular product depend on a number of factors, such as climate and type of user. DOE plans to perform sensitivity analyses to consider how differences in energy use will affect subgroups of customers.

DOE will determine the effect on customer subgroups using the LCC spreadsheet model. NWPC stated that the Monte Carlo approach, if implemented in the LCC and PBP analyses, can be used to conduct the subgroup analysis. NWPC stated that the Monte Carlo approach is suitable for identifying different subgroups, such as regional subgroups, that may be impacted differently by standards. (Public Meeting Transcript, No. 5 at p. 235) As described in section II.G on the LCC and PBP analyses, DOE used a Monte Carlo approach to conduct the LCC and PBP analyses. The spreadsheet model it used for the LCC analysis, which incorporates the use of Monte Carlo sampling, can be used with different data inputs. The standard LCC analysis includes various customer types that use the four appliance products. DOE can analyze the LCC for any subgroup, such as low-income consumers, by using the LCC spreadsheet model and sampling only that subgroup. Details of this model are explained in section II.G.

DOE received several comments as to which subgroups it should analyze. EEI suggested that DOE consider low-

income and senior subgroups. It stated that low-income consumers are more likely to use CCWs, and that seniors tend to use dishwashers and cooking products less frequently than the overall population. (EEE, No. 7 at p. 6) For CCWs, ALS stated that DOE should consider low-income consumers and senior citizens, especially if standards cause an increase in vending prices. ALS stated that the resulting increase in vending price would lead to less available disposable income for low-income and senior consumers to use commercial laundry. MLA expressed the same concerns, but only for low-income consumers. (Public Meeting Transcript, No. 5 at p. 237; MLA, No. 8 at p. 2)

GE and PG&E suggested that DOE consider regional subgroups. GE stated that regional subgroups for dishwashers and cooking products would be appropriate because the regional saturations for both sets of products vary significantly. (Public Meeting Transcript, No. 5 at pp. 240–241) PG&E stated that DOE should consider regional subgroups for dehumidifiers. (Public Meeting Transcript, No. 5 at p. 237) Lastly, the EPA thought it would be

prudent to consider subgroups that are not served by water and sewer service providers, but by wells and septic systems. EPA believes that these consumers use less water than the overall population. (Public Meeting Transcript, No. 5 at p. 234)

DOE intends to analyze the impacts of candidate standards on low-income and senior subgroups. DOE also will evaluate whether regional variations are significant enough to warrant an analysis of regional subgroups for dishwashers, dehumidifiers, and cooking products. In its analysis of dishwashers and CCWs, DOE will also consider evaluating those consumer subgroups not served by water and sewer. In its analysis of subgroups, DOE will be especially sensitive to purchase price increases ("first-cost" increases) to avoid negative impacts on identifiable population groups such as low-income households (in the case of residential products) or small businesses with low annual revenues (in the case of CCWs), which may not be able to afford a significant increase in product or equipment prices.

K. Manufacturer Impact Analysis

The purpose of the MIA is to identify the likely impacts of energy conservation standards on manufacturers. DOE has begun and will continue to conduct this analysis with input from manufacturers and other interested parties. DOE will subsequently apply a similar methodology to its evaluation of standards. During the MIA, DOE will consider financial impacts and a wide range of quantitative and qualitative industry impacts that might occur following the adoption of a standard. For example, if DOE adopts a particular standard level, it could require changes to manufacturing practices. DOE will identify and understand these impacts through interviews with manufacturers and other stakeholders during the NOPR stage of its analysis.

Recently, DOE announced changes to the MIA format through a report issued to Congress on January 31, 2006 (as required by section 141 of EPCACT 2005), entitled "Energy Conservation Standards Activities." Previously, DOE did not report any MIA results during the ANOPR phase of energy conservation standards rulemakings; however, under this new format, DOE has collected, evaluated, and reported some preliminary information and data in section II.K.6 of this ANOPR. For further information on the MIA process, the analysis, and the results, please refer to Chapter 12 of the TSD.

DOE conducts the MIA in three phases. In Phase I, DOE creates an industry profile to characterize the industry, and conducts a preliminary MIA to identify important issues that require consideration. Results of the Phase I analysis are presented in Chapter 12 of the TSD. In Phase II, DOE prepares an industry cash flow model and an interview questionnaire to guide subsequent discussions. In Phase III, DOE interviews manufacturers, and assesses the impacts of standards both quantitatively and qualitatively. It assesses industry and subgroup cash flow and net present value through use of the Government Regulatory Impact Model (GRIM). DOE then assesses impacts on competition, manufacturing capacity, employment, and regulatory burden based on manufacturer interview feedback and discussions. Results of the Phase II and Phase III analyses are presented in the NOPR TSD.

1. Sources of Information for the Manufacturer Impact Analysis

Many of the analyses described above provide important inputs to the MIA. Such inputs include manufacturing costs and prices from the engineering analysis, retail price forecasts, and shipments forecasts. DOE supplements this information with company financial data and other information gathered during interviews with manufacturers. As discussed below, this interview process plays a key role in the MIA because it allows interested parties to privately express their views on important issues. To preserve confidentiality, DOE aggregates these perspectives across manufacturers, creating a combined opinion or estimate for use in its analyses. This process enables DOE to incorporate sensitive information from manufacturers in the rulemaking process without specifying precisely which manufacturer provided a certain set of data.

DOE conducts detailed interviews with manufacturers to gain insight into the range of potential impacts of standards. During the interviews, DOE typically solicits both quantitative and qualitative information on the potential impacts of efficiency levels on sales, direct employment, capital assets, and industrial competitiveness. DOE prefers an interactive interview process, rather than a written response to a questionnaire, because it helps clarify responses and identify additional issues. Before each interview, DOE circulates a draft document showing its estimates of financial parameters based on publicly available information, such as filings with the SEC, articles in trade

publications, etc. DOE subsequently solicits comments and suggestions on these estimates during the interviews.

DOE asks interview participants to identify any confidential information that they have provided, either orally or in writing. DOE considers all information collected, as appropriate, in its decision-making process. However, DOE does not make confidential information available in the public record. DOE also asks participants to identify all information that they wish to have included in the public record, but that they do not want to have associated with their interview or company; DOE incorporates such information into the public record, but reports it without attribution.

Finally, DOE collates the completed interview questionnaires and prepares a summary of the major issues. For more detail on the methodology used in the MIA, refer to Chapter 12 of the TSD.

2. Industry Cash Flow Analysis

The industry cash flow analysis relies primarily on the GRIM, which helps identify the effects of various efficiency regulations and other regulations on manufacturers. The basic structure of the GRIM is a standard annual cash flow analysis that uses price and volume information as an input, builds on fundamental base cost information, and accepts a set of regulatory conditions as changes in costs and investments. DOE uses the GRIM to analyze the financial impacts of more stringent energy conservation standards on the industry.

The GRIM analysis uses several factors to determine annual cash flows from a new standard: (1) Annual expected revenues; (2) manufacturer costs including cost of goods sold; (3) depreciation; (4) research and development; (5) selling, general, and administrative expenses; (6) taxes; and (7) conversion capital expenditures. DOE compares the results against base case projections that involve no new standards. The financial impact of new standards is the difference between the two sets of discounted annual cash flows. For more information on the industry cash flow analysis, refer to Chapter 12 of the TSD.

3. Manufacturer Subgroup Analysis

Industry cost estimates are not adequate to assess differential impacts among subgroups of manufacturers. For example, small and niche manufacturers, or manufacturers whose cost structure differs significantly from the industry average, could experience a disproportionate impact due to standards changes. Because DOE cannot consider the impact on every firm

individually, the results of the industry characterization are typically used to group manufacturers exhibiting similar characteristics.

During MIA interviews, DOE discusses the potential subgroups and subgroup members it has identified for the analysis. DOE encourages the manufacturers to recommend subgroups or characteristics that are appropriate for the subgroup analysis. For more detail on the manufacturer subgroup analysis, refer to Chapter 12 of the TSD.

4. Competitive Impacts Assessment

Another factor which DOE must consider in standard setting is whether a new standard is likely to reduce industry competition, and the Attorney General must determine the impacts, if any, of reduced competition. DOE makes a determined effort to gather and report firm-specific financial information and impacts. In particular, the competitive impacts assessment focuses on the impacts of new energy efficiency standards on smaller manufacturers. DOE bases this assessment on manufacturing cost data and on information collected from interviews with manufacturers. Hence, manufacturer interviews also focus on gathering information to help assess asymmetrical cost increases to some manufacturers, increased proportions of fixed costs that could increase business risks, and potential barriers to market entry (*e.g.*, proprietary technologies).

5. Cumulative Regulatory Burden

DOE recognizes and seeks to mitigate the overlapping effects on manufacturers of new or revised DOE standards and other regulatory actions affecting the same equipment. Thus, DOE analyzes and considers the impact on manufacturers of multiple, product-specific regulatory actions.

Based on its own research and discussions with manufacturers, DOE has identified several regulations relevant to dishwasher, dehumidifier, cooking product, and CCW manufacturers, including existing or new standards, the phase-out of hydrochlorofluorocarbon refrigerants, the prohibition of phosphate-containing detergents in some jurisdictions, standards for other products made by dishwasher, dehumidifier, cooking product, and CCW manufacturers, including State standards, and foreign energy conservation standards. (Although foreign standards do not directly affect products entering the U.S., they do impact manufacturer operations, in that they represent additional business expenses for

manufacturers selling outside the U.S. market.)

DOE will study the potential impacts of these cumulative burdens in greater detail during the MIA conducted during the NOPR phase.

6. Preliminary Results for the Manufacturer Impact Analysis

DOE conducted a preliminary evaluation of the impact of potential new regulations for the products to be covered by this rulemaking on manufacturer financial performance, manufacturing capacity and employment levels, and product utility and innovation. A primary focus was to identify the cumulative burden that industry faces from the overlapping effect of new or recent energy conservation standards and/or other regulatory action affecting the same product or industry.

The primary sources of information for this analysis were telephone interviews with manufacturers of dishwashers, dehumidifiers, and CCWs carried out during the first quarter of FY 2007. To maintain confidentiality, DOE did not identify the individual manufacturers that disclosed information. Instead, the evaluation only reports aggregated information and does not disclose sensitive information or identify company-specific information. For the preliminary MIA, DOE conducted interviews with manufacturers primarily to identify key issues and gain insights into the qualitative impacts of energy conservation standards. For each product, DOE used an interview guide to gather responses from multiple manufacturers on several issues. All the interview guides covered the same general topic areas, but DOE adapted them, as appropriate, to address each product category. (Copies of the interview guides for CCW, dehumidifier, and dishwasher manufacturers are contained in Appendix B of the TSD.)

However, DOE did not interview cooking product manufacturers at this stage due to feedback from stakeholders such as AHAM and several cooking product manufacturers, suggesting that DOE limit its efforts to updating the extensive 1996 cooking product technical analysis; these stakeholders reasoned that such an update would properly represent prices, design options, and manufacturer issues for products covered by the present rulemaking. Thus, DOE updated the 1996 cooking products analysis and plans to interview manufacturers of cooking products during the NOPR stage

of this rulemaking to get feedback on its analysis and results.

During the course of the preliminary MIA, DOE interviewed manufacturers representing over 80 percent of domestic dishwasher sales, 66 percent of domestic dehumidifier sales, and practically 100 percent of CCW sales. DOE used these same interviews to review the engineering analysis cost and performance data contained in chapter 5 of the TSD. However, during the course of the MIA interviews, focus of the discussion was shifted from technology-related topics to business-related topics. DOE's objective was to become familiar with each company's particular market approach and financial structure, and its concerns and issues related to new efficiency standards. Most of the information received from these meetings is protected by non-disclosure agreements and resides with DOE's contractors. Before each visit, DOE provided company representatives with an interview guide that included the topics that DOE hoped to cover. The topics included:

- Key issues—the most important things to consider in setting new standards from the perspective of manufacturers;
- Product mix—effects of potential standard levels on a manufacturer's product mix;
- Profitability—insights into market forces which could affect a manufacturer's profitability;
- Conversion costs—estimates of costs required to meet new standards;
- Manufacturing capacity and employment levels—decisions to upgrade, remodel, or relocate existing facilities and resulting changes in employment patterns resulting from new energy efficiency standards;
- Market share and industry consolidation—changes to competitive dynamics of the marketplace and the possible consequences for consumers;
- Product utility and innovation—effect of standards on product utility and innovation; and
- Cumulative burden—assessment of the level and timing of investments manufacturers are expecting to incur as a result of other regulations.

Additionally, DOE often introduced, entertained, and discussed other topics during the course of the interviews, such as the impact of various design options on energy efficiency, how testing standards and usage patterns vary by market, and performance issues.

Perhaps the most important aspect of the preliminary MIA was the opportunity it created for DOE to identify key manufacturer issues early in the development of new standards.

During the interviews, DOE engaged the manufacturers in a discussion of their perception of the key issues in the rulemaking. DOE then added these key issues to the list of questions and topics explored during the interviews.

The concerns that rose to the level of key issues in the opinion of dishwasher manufacturers included: (1) The potential elimination of entry-level dishwashers from the market; (2) a possible reduction in dishwasher washing performance; (3) the increased likelihood of consumers hand washing and pre-rinsing dishes; and (4) the potential relocation of production facilities overseas.

The key issues expressed by dehumidifier manufacturers included: (1) The ability to pass cost increases on to consumers; (2) increased pressure from foreign competition; and (3) the ability to maintain Energy Star product offerings.

The key issues for CCW manufacturers included: (1) The risk of eliminating vertical-axis washers from the market; (2) reduced product shipments due to a move away from central laundry facilities to in-unit residential laundry and prolonging the life of existing equipment; (3) reduced cleaning performance of some energy-saving design options; (4) the possible relocation of production facilities outside the country; and (5) the potential for industry consolidation and/or the elimination of the low-volume manufacturer.

For more preliminary results for the MIA, such as other impacts on financial performance, impacts on product utility and performance, and additional details on the impacts of cumulative regulatory burden, refer to Chapter 12 of the TSD.

L. Utility Impact Analysis

The utility impact analysis estimates the effects on the utility industry of reduced energy consumption due to improved appliance efficiency. The analysis compares modeling results for the base case with results for each candidate standards case. For each of the four appliance products, the analysis will consist of forecasted differences between the base and standards cases for electricity generation, installed capacity, sales, and prices. For CCWs, as well as residential dishwashers and cooking products, the analysis also will examine differences in sales of natural gas.

To estimate these effects of proposed standards on the electric and gas utility industries, DOE intends to use a variant

of the EIA's NEMS.⁵⁶ EIA uses NEMS to produce its AEO. NEMS produces a widely recognized reference case forecast for the United States and is available in the public domain. DOE will use a variant known as NEMS-Building Technologies (BT) to provide key inputs to the analysis.

The use of NEMS for the utility impact analysis offers several advantages. As the official DOE energy forecasting model, NEMS relies on a set of premises that are transparent and have received wide exposure and commentary. NEMS allows an estimate of the interactions between the various energy supply and demand sectors and the economy as a whole. The utility impact analysis will determine the changes for electric utilities in installed capacity and in generation by fuel type produced by each candidate standard level, as well as changes in gas and electricity sales to the commercial sector (for CCWs) and the consumer sector (for residential dishwashers, dehumidifiers, and cooking products). (Because dehumidifiers neither operate on gas nor rely on water heated by gas, standards for this product do not affect gas sales.)

DOE plans to conduct the utility impact analysis as a variant of the NEMS used to produce the *AEO 2007*, applying the same basic set of premises. For example, the utility impact analysis uses the operating characteristics (e.g., energy conversion efficiency, emissions rates) of future electricity generating plants and the prospects for natural gas supply as specified in the *AEO* reference case.

DOE will also explore deviations from some of the *AEO 2007* reference case premises to represent alternative futures. Two alternative scenarios use the high- and low-economic-growth cases of *AEO 2007*. (The reference case corresponds to medium growth.) The high-economic-growth case uses higher projected growth rates for population, labor force, and labor productivity, resulting in lower predicted inflation and interest rates relative to the reference case. The opposite is true for the low-growth case. Starting in 2012, the high-growth case predicts growth in per capita gross domestic product of 3.4

⁵⁶For more information on NEMS, please refer to the U.S. Department of Energy, Energy Information Administration documentation. A useful summary is *National Energy Modeling System: An Overview 2003*, DOE/EIA-0581(2003), March 2003. DOE/EIA approves use of the name NEMS to describe only an official version of the model without any modification to code or data. Because this analysis entails some minor code modifications and the model is run under various policy scenarios that are variations on DOE/EIA assumptions, in this analysis, DOE refers to it by the name NEMS-BT.

percent per year, compared with 2.9 percent per year in the reference case and 2.2 percent per year in the low-growth case. As part of varying supply-side growth determinants in these cases, *AEO 2007* also varies the forecasted energy prices for all three economic growth cases. Different economic growth cases affect the rate of growth of electricity demand.

The electric utility industry analysis will consist of NEMS-BT forecasts for generation, installed capacity, sales, and prices. The gas utility industry analysis will consist of NEMS-BT forecasts of sales and prices. The NEMS-BT provides reference case load shapes for several end uses, including residential dishwashing and cooking, but does not provide load shapes⁵⁷ specifically for dehumidifiers and CCWs. Because most of the energy consumed by clothes washers is expended on water heating, DOE intends to use NEMS-BT's commercial water-heating load shapes to characterize CCWs. For dehumidifiers, because this end use is operated in a similar manner to air-conditioning equipment, DOE intends to use NEMS-BT residential space-cooling load shapes to characterize it. For electrical end uses, NEMS-BT uses predicted growth in demand for each end use to build up a projection of the total electrical system load growth for each region, which it uses in turn to predict the necessary additions to capacity. For both electrical and gas end uses, NEMS-BT accounts for the implementation of efficiency standards by decrementing the appropriate reference case load shape. DOE will determine the size of the decrement using data for the per-unit energy savings developed in the LCC and PBP analyses (see Chapter 8 of the TSD) and the forecast of shipments developed for the NIA (see Chapter 9 of the TSD). For more information on the utility impact analysis, refer to Chapter 13 of the TSD.

EEI commented that an accurate assessment of electric utility impacts requires an evaluation of the type of load of the appliance (i.e., whether the load is primarily during system peak demand or off-peak). (Public Meeting Transcript, No. 5 at p. 264) In response, we note that in 2001, EIA conducted a review of its end-use load shapes and updated them to better reflect actual end use behavior.⁵⁸ As a result, DOE has

⁵⁷The "load shape" defines how the product uses energy on an hourly basis over the course of the day.

⁵⁸*Alternative Sectoral Load Shapes for NEMS*, Department of Energy—Energy Information Administration, Washington, DC, August 2001.

confidence that the NEMS–BT provides a good representation of the type of loads exhibited by its end uses.

With regard to gas utility impacts, the AGA commented that NEMS–BT does not address these impacts in a meaningful way. AGA suggested that DOE should conduct a workshop on proposed modeling approaches to analyzing gas utility impacts. (AGA, No. 12 at p. 3) As noted above, NEMS–BT allows for the determination of changes in gas sales due to efficiency standards. Therefore, DOE's gas utility impact analysis goes no further than assessing the impact on gas sales.

Since the *AEO 2007* version of NEMS forecasts only to the year 2030, DOE would be required to extrapolate results for such forecasts to 2042. DOE conducts an extrapolation to 2042 to be consistent with the analysis period being used by DOE in the NIA. However, DOE has determined that it will not be feasible to extend the forecast period of NEMS–BT for the purposes of this analysis, in part because EIA does not have an approved method for extrapolation of many outputs beyond 2030. While it might seem reasonable in general to make simple linear extrapolations of results, in practice this is not advisable because outputs could be contradictory. For example, changes in the fuel mix implied by extrapolations of those outputs could be inconsistent with the extrapolation of marginal emissions factors. An analysis of various trends is not necessary and would involve a great deal of uncertainty. Therefore, for all extrapolations beyond 2030, DOE intends to use simple replications of year 2030 results. While these may seem unreasonable in some instances, in this way results are guaranteed to be consistent. As with the *AEO* reference case in general, the implicit premise is that the regulatory environment does not deviate from the current known situation during the extrapolation period. Only changes that have been announced with date-certain introduction are included in NEMS–BT.

Both EEI and SPU stated that DOE should factor impacts to water and wastewater utilities into the utility impact analysis. SPU claimed that, in some areas of the country, water is becoming a limited commodity and should be assessed in the context of a utility impact analysis. (EEI, No. 7 at p. 6; Public Meeting Transcript, No. 5 at p. 263) Although NEMS–BT provides estimates of changes in electrical utility infrastructure requirements as a

function of end-use energy savings, it does not currently have the capability of calculating similar results for water and wastewater utilities. The water utility sector is more complicated than either the electric utility or gas utility sectors, with a high degree of geographic variability produced by a large diversity of water resource availability, institutional history, and regulatory context. DOE currently does not have access to tools that analyze water utility impacts. There are activities being conducted or initiated by the USGS, EPA, and DOE to study water and wastewater issues. However, these activities have yet to provide the necessary sources of data or tools to enable a water utility impact analysis comparable to what can be done on electric and gas utilities using NEMS. Therefore, conducting a credible water and wastewater utility analysis is beyond DOE's existing analysis capabilities.

M. Employment Impact Analysis

The Process Rule includes employment impacts among the factors to be considered in selecting a proposed standard, and it provides guidance for consideration of the impact (both direct and indirect) of candidate standard levels on employment. The Process Rule states a general presumption against any candidate standard level that would directly cause plant closures or significant loss of domestic employment, unless specifically identified expected benefits of the standard would outweigh the adverse effects. See the Process Rule, 10 CFR Part 430, Subpart C, Appendix A, sections 4(d)(7)(ii) and (vi), and 5(e)(3)(i)(B).

DOE estimates the impacts of standards on employment for equipment manufacturers, relevant service industries, energy suppliers, and the economy in general. Both indirect and direct employment impacts are covered. Direct employment impacts would result if standards led to a change in the number of employees at the factories that produce the four appliance products and related supply and service firms. Direct impact estimates are covered in the MIA.

Indirect employment impacts are impacts on the national economy other than in the manufacturing sector being regulated. Indirect impacts may result both from expenditures shifting among goods (substitution effect) and changes in income that lead to a change in overall expenditure levels (income effect). DOE defines indirect employment impacts from standards as net jobs created or eliminated in the

general economy as a result of increased spending driven by the increased equipment prices and reduced spending on energy.

DOE expects new standards for the four appliance products to increase the total installed cost of equipment, which includes manufacturer selling price, sales taxes, distribution chain markups, and installation cost. DOE also expects the new standards to decrease energy consumption, and thus expenditures on energy. Over time, increased total installed cost is paid back through energy savings. The savings in energy expenditures may be spent on new commercial investment and other items.

Using an input/output model of the U.S. economy, this analysis seeks to estimate the effects on different sectors and the net impact on jobs. DOE will estimate national employment impacts for major sectors of the U.S. economy in the NOPR, using public and commercially available data sources and software. DOE will make all methods and documentation available for review in the TSD for the NOPR.

In overview, DOE developed Impact of Sector Energy Technologies (ImSET), a spreadsheet model of the U.S. economy that focuses on 188 sectors most relevant to industrial, commercial, and residential building energy use.⁵⁹ ImSET is a special-purpose version of the U.S. Benchmark National Input-Output (I–O) model, which has been designed to estimate the national employment and income effects of energy saving technologies that are deployed by DOE's Office of Energy Efficiency and Renewable Energy. In comparison with the previous versions of the model used in earlier rulemakings, this version allows for more complete and automated analysis of the essential features of energy efficiency investments in buildings, industry, transportation, and the electric power sectors. The ImSET software includes a computer-based I–O model with structural coefficients to characterize economic flows among the 188 sectors. ImSET's national economic I–O structure is based on the 1997 Benchmark U.S. table (Lawson, *et al.* 2002),⁶⁰ specially aggregated to 188 sectors.

Standards for the four appliance products may reduce energy

⁵⁹ Roop, J.M., M.J. Scott, and R.W. Schultz. 2005. *ImSET: Impact of Sector Energy Technologies*. PNNL–15273. Pacific Northwest National Laboratory, Richland, WA.

⁶⁰ Lawson, Ann M., Kurt S. Bersani, Mahnaz Fahim-Nader, and Jiemin Guo. 2002. "Benchmark Input-Output Accounts of the U. S. Economy, 1997," *Survey of Current Business*, December, pp. 19–117.

expenditures and increase equipment prices in the commercial sector. These expenditure changes are likely to reduce commercial and energy sector employment. At the same time, these equipment standards may increase commercial sector investment, and increase employment in other sectors of the economy. DOE designed the employment impact analysis to estimate the year-to-year net employment effect of these different expenditure flows.

Although DOE intends to use ImSET for its analysis of employment impacts, it welcomes input on other tools and factors it might consider. For more information on the employment impact analysis, refer to Chapter 14 of the TSD.

N. Environmental Assessment

The primary environmental effect of energy conservation standards for the four appliance products would be reduced power plant emissions resulting from reduced consumption of electricity. DOE will assess these environmental effects by using NEMS-BT to provide key inputs to its analysis. The environmental assessment produces results in a manner similar to those provided in the *AEO*. In addition to electrical power, the operation of three of the four appliance products—CCWs, dishwashers, and cooking products—also requires use of fossil fuels, and results in emissions of carbon dioxide (CO₂), nitrogen oxides (NO_x), and sulfur dioxide (SO₂) at the sites where the appliances are installed. Southern California Gas Company (SoCal Gas) and PG&E questioned how DOE will evaluate the emissions from gas-fired appliances. (Public Meeting Transcript, No. 5 at pp. 271–272) In response, we note that NEMS-BT provides no means for estimating such site emissions. Therefore, DOE will calculate, and the environmental assessment will include, separate estimates of the effect of the proposed standard on site emissions of CO₂, NO_x, and SO₂, based on simple emissions factors derived from the literature.⁶¹

The intent of the environmental assessment is to provide emissions results estimates and to properly quantify and consider the environmental effects of all new Federal rules. The portion of the environmental assessment that will be produced by NEMS-BT considers only three pollutants, SO₂, NO_x, and mercury, and one other emission (carbon). The only form of carbon the NEMS-BT model

tracks is CO₂. Therefore, the carbon discussed in this analysis is only in the form of CO₂. For each of the trial standard levels, DOE will calculate total undiscounted and discounted power plant emissions using NEMS-BT, and will use other methods to calculate site emissions.

Although DOE plans to consider only SO₂, NO_x, mercury, and CO₂ in its environmental assessment, there are other air pollutants which are of concern. Specifically, the Clean Air Act requires EPA to set National Ambient Air Quality Standards for the following six common air pollutants, also known as “criteria pollutants”: (1) Ozone, (2) particulate matter (PM), (3) carbon monoxide (CO), (4) nitrogen dioxide, (5) SO₂, and (6) lead.⁶² EPA recently added mercury to this list. But none of the “criteria pollutants” not considered in the environmental assessment (*i.e.*, ozone, PM, CO, and lead) are driven significantly by either electric utility power plants or fuel-fired appliances. Therefore, DOE does not intend on addressing them in the environmental assessment. In the case of ozone and PM, other pollutants are precursors to their formation, and atmospheric conditions are the driver behind their formation. Also, SO₂ and NO_x are the primary precursors to ozone and PM, respectively, and will already be addressed by the environmental assessment. In the case of CO, electric utilities and fuel-fired appliances are not significant sources. For electric power plants, almost all carbon emissions come out in the form of CO₂ as the combustion process is lean enough not to yield CO in significant amounts. For fuel-fired appliances, proper appliance maintenance, installation, and use can prevent dangerous levels of CO. A well-designed and properly functioning heating or cooking appliance should not produce toxic or lethal levels of CO, as, most often, CO poisoning occurs in the home as a result of malfunctioning appliances. Finally, with regard to lead, the ban on the use of leaded gasoline has resulted in a dramatic decrease in lead emissions since the mid-1970s. Today, industrial processes (not electric utilities), particularly primary and secondary lead smelters and battery manufacturers, are responsible for most of lead emissions and all violations of the lead air quality standards.

As to power plant emissions, DOE will conduct each environmental assessment performed as part of this

rulemaking as an incremental policy impact (*i.e.*, a standard for the product under evaluation) on the *AEO 2007* forecast, applying the same basic set of assumptions used in *AEO 2007*. For example, the emissions characteristics of an electricity generating plant will be exactly those used in *AEO 2007*. Also, forecasts conducted with NEMS-BT consider the supply-side and demand-side effects on the electric utility industry. Thus, DOE's analysis will account for any factors affecting the type of electricity generation and, in turn, the type and amount of airborne emissions generated by the utility industry.

The NEMS-BT model tracks carbon emissions with a specialized carbon emissions estimation subroutine, producing reasonably accurate results due to the broad coverage of all sectors and inclusion of interactive effects. Past experience with carbon results from NEMS suggests that emissions estimates are somewhat lower than emissions based on simple average factors. One of the reasons for this divergence is that NEMS tends to predict that conservation displaces generating capacity in future years. On the whole, NEMS-BT provides carbon emissions results of reasonable accuracy, at a level consistent with other Federal published results.

NEMS-BT also reports SO₂, NO_x, and mercury, which DOE has reported in past analyses. The Clean Air Act Amendments of 1990 set an SO₂ emissions cap on all power generation.⁶³ The attainment of this aggregate limit, however, is flexible among generators of emissions, due to the availability of emissions allowances and tradable permits. Although NEMS includes a module for SO₂ allowance trading and delivers a forecast of SO₂ allowance prices, accurate simulation of SO₂ trading implies that the effect of efficiency standards on physical emissions will be zero because emissions will always be at or near the ceiling. However, there may be an SO₂ benefit from energy conservation, in the form of a lower SO₂ allowance price. Since the impact of any one standard on the allowance price is likely small and highly uncertain, DOE does not plan to monetize any potential SO₂ benefit.

NEMS-BT also has an algorithm for estimating NO_x emissions from power generation. The impact of these emissions, however, will be affected by the Clean Air Interstate Rule (CAIR), which the EPA published on May 12, 2005. CAIR will permanently cap

⁶¹ U.S. Environmental Protection Agency. *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area Sources*. 1998. Available online at: <http://www.epa.gov/ttn/chieff/ap42.html>.

⁶² U.S. Environmental Protection Agency. *Six Common Air Pollutants*. Washington, DC. Available online at: <http://www.epa.gov/air/urbanair/>.

⁶³ See 40 CFR part 50. (See also U.S. Environmental Protection Agency Web site at: <http://www.epa.gov/air/caa/>).

emissions of NO_x in 28 eastern States and the District of Columbia. 70 FR 25162 (May 12, 2005). As with SO₂ emissions, a cap on NO_x emissions means that equipment efficiency standards may have no physical effect on these emissions. When NO_x emissions are subject to emissions caps, DOE's emissions reduction estimate corresponds to incremental changes in the prices of emissions allowances in cap-and-trade emissions markets rather than physical emissions reductions. Therefore, while the emissions cap may mean that physical emissions reductions will not result from standards, standards could produce an economic benefit in the form of lower prices for emissions allowance credits. However, as with SO₂ allowance prices, DOE does not plan to monetize this benefit because the impact on the NO_x allowance price from any single energy conservation standard is likely small and highly uncertain.

EEI stated that new rules pertaining to power plant SO₂ and NO_x emissions will limit the impact that standards can have on reducing these emissions. (EEI, No. 7 at p. 4) As noted above, NEMS-BT accounts for the most recent regulations pertaining to power plant SO₂ and NO_x emissions and expects that appliance efficiency standards will not have any physical effect on these emissions.

With regard to mercury emissions, NEMS has an algorithm for estimating these emissions from power generation. However, the impact on mercury emissions will be affected by the Clean Air Mercury Rule (CAMR), which the EPA published on May 18, 2005. 70 FR 28606. CAMR will permanently cap emissions of mercury for new and existing coal-fired plants in all States. As with SO₂ and NO_x emissions, a cap on mercury emissions means that appliance efficiency standards may have no physical effect on these emissions. When mercury emissions are subject to emissions caps, DOE's emissions reduction estimate corresponds to incremental changes in the prices of emissions allowances in cap-and-trade emissions markets rather than physical emissions reductions. Therefore, while the emissions cap may mean that physical emissions reductions will not result from standards, standards could produce an economic benefit in the form of lower prices for emissions allowance credits. However, as with SO₂ and NO_x allowance prices, DOE does not plan to monetize this benefit because the impact on the mercury allowance price from any single energy conservation standard is likely small and highly uncertain.

The Joint Comment stated that DOE should evaluate mercury and particulate emissions as part of the environmental assessment due to their impact on public health. (Joint Comment, No. 9 at p. 3) In response, as noted above, NEMS-BT accounts for the most recent regulations pertaining to power plant mercury emissions and expects that standards will not have any physical effect on the level of these emissions. With regard to particulates, these emissions are a special case because they arise not only from direct emissions, but also from complex atmospheric chemical reactions that result from NO_x and SO₂ emissions. Because of the highly complex and uncertain relationship between particulate emissions and particulate concentrations that impact air quality, DOE does not plan on reporting particulate emissions.

Potomac and SPU urged DOE to evaluate wastewater discharge impacts due to increased efficiency standards. (Public Meeting Transcript, No. 5 at p. 269) DOE plans to conduct a separate analysis of wastewater discharge impacts as part of the environmental assessment. DOE intends to derive a simple national aggregate estimate of wastewater discharge impacts from proposed energy conservation standards, based on estimates of consumer water savings. It will first provide a simple estimate of the fraction of water savings that result in decreased wastewater discharges. Then, by applying this discharge fraction to the water savings estimate, DOE can provide an approximate wastewater discharge savings estimate.

The results for the environmental assessment are similar to a complete NEMS run as published in the *AEO 2007*. These results include power sector emissions for SO₂, NO_x, and carbon in five-year forecasted increments extrapolated to 2042. The outcome of the analysis for each candidate standard level is reported as a deviation from the *AEO 2007* reference (base) case.

For more detail on the environmental assessment, refer to the environmental assessment report in the TSD.

O. Regulatory Impact Analysis

DOE will prepare a draft regulatory impact analysis in compliance with Executive Order 12866, "Regulatory Planning and Review," which will be subject to review by OMB's Office of Information and Regulatory Affairs (OIRA). 58 FR 51735 (October 4, 1993).

As part of the regulatory impact analysis, and as discussed in section II.K, "Manufacturer Impact Analysis,"

DOE will identify and seek to mitigate the overlapping effects on manufacturers of new or revised DOE standards and other regulatory actions affecting the same products. Through manufacturer interviews and literature searches, DOE will compile information on burdens from existing and impending regulations affecting the four appliance products covered under this rulemaking. DOE also seeks input from stakeholders about relevant regulations whose impacts it should consider.

The regulatory impact analysis also will address the potential for non-regulatory approaches to supplant or augment energy conservation standards to improve the efficiency of the four appliance products. One such potential non-regulatory program is tax credits. In assessing the potential impacts from tax credits, EEI suggested that DOE should evaluate the long-term effects on market transformation to more-efficient products from short-term (e.g., two-year) tax credits. (Public Meeting Transcript, No. 5 at p. 278) AHAM stated that recent Federal tax credits for dishwashers will have an effect on improving overall product efficiency and that DOE should consider such effect as part of analyzing the impact of tax credits. (Public Meeting Transcript, No. 5 at p. 277) In response, we noted that the NOPR will include a complete quantitative analysis of alternatives to the proposed energy conservation standards (including tax credits), and DOE will use the most recent information available to make its assessments. DOE will use the NES spreadsheet model (as discussed in section II.I, "National Impact Analysis") to calculate the NES and NPV for the alternatives to the proposed conservation standards. For more information on the regulatory impact analysis, refer to the regulatory impact analysis report in the TSD.

III. Candidate Energy Conservation Standard Levels

The Process Rule states that DOE will specify candidate standard levels in the ANOPR, but will not propose a particular standard. 10 CFR Part 430, Subpart C, Appendix A, section 4(c)(1)(i). Section II.I.4, "National Impact Analysis Results" identifies the candidate standard levels for each of the four appliance products. Tables III.1 through III.4 repeat the candidate standard levels for each of the four appliance products.

TABLE III.1.—STANDARD DISHWASHERS: CANDIDATE STANDARD LEVELS

Candidate standard level	Energy factor
1	0.46
2	0.58
3	0.62

TABLE III.1.—STANDARD DISHWASHERS: CANDIDATE STANDARD LEVELS—Continued

Candidate standard level	Energy factor
4	0.65
5	0.72
6	0.80

TABLE III.1.—STANDARD DISHWASHERS: CANDIDATE STANDARD LEVELS—Continued

Candidate standard level	Energy factor
7	1.11

TABLE III.2.—DEHUMIDIFIERS: CANDIDATE STANDARD LEVELS

Candidate standard level	≤25.00	25.01–35.00	35.01–45.00	45.01–54.00	54.01–74.99	≥75.00
	EF	EF	EF	EF	EF	EF
1	1.10	1.25	1.35	1.45	1.55	2.38
2	1.20	1.30	1.40	1.50	1.60	2.50
3	1.25	1.35	1.45	1.55	1.65	2.55
4	1.30	1.40	1.50	1.60	1.70	2.60
5	1.38	1.45	1.74	2.02	1.80	2.75

TABLE III.3.—COOKING PRODUCTS: CANDIDATE STANDARD LEVELS

Candidate standard level	Cooktops			Ovens				Microwave ovens
	Elec coil	Elec smooth	Gas	Elec stand-ard	Elec self-clean	Gas stand-ard	Gas self-clean	EF
	EF	EF	EF	EF	EF	EF	EF	
1*	0.769	0.752	0.399	0.1113	0.1102	0.0536	0.0625	0.586
2	0.420	0.1163	0.1123	0.0566	0.0627	0.588
3	0.1181	.....	0.0572	0.0632	0.597
4	0.1206	.....	0.0593	.....	0.602
5	0.1209	.....	0.0596	.....	.....
6	0.0600	.....	.....
1a*	0.0583	.....	.....

* For gas standard ovens, candidate standard levels 1 and 1a correspond to designs that are utilized for the same purpose—eliminate the need for a standing pilot—but the technologies for each design are different. Candidate standard level 1 is a hot surface ignition device while candidate standard level 1a is a spark ignition device. Candidate standard level 1a is presented at the end of the table because candidate standard levels 2 through 6 are derived from candidate standard level 1.

TABLE III.4.—COMMERCIAL CLOTHES WASHERS: CANDIDATE STANDARD LEVELS

Candidate standard level	Modified energy factor/water factor
1	1.42/9.50
2	1.60/8.50
3	1.72/8.00
4	1.80/7.50
5	2.00/5.50
6	2.20/5.10

DOE will review the public input it receives in response to this ANOPR and will update the analyses appropriately for each product class before issuing the NOPR. In addition, DOE will consider any comments it receives on the candidate standard levels set forth above for the four appliance products, and on whether alternative levels would satisfy EPCA criteria for DOE adoption of standards, for example:

- A moderate increase in the efficiency level at an earlier effective

date (e.g., an effective date two years after the publication of the final rule); or

- A larger increase in the efficiency level at a later effective date.

For the NOPR, DOE will develop trial standard levels (TSL) from the above candidate standard levels for each of the four appliance products. DOE will consider several criteria in developing the TSLs, including, but not limited to, which candidate standard level has the minimum LCC, maximum NPV, and maximum technologically feasible efficiency. From the list of TSLs developed, DOE will select one as its proposed standard for the NOPR, while explaining the other TSLs considered and the reasons for their elimination in deciding upon the level ultimately proposed.

For a given product consisting of several product classes (e.g., dehumidifiers and cooking products), DOE will develop each TSL so that it is comprised of candidate standard levels from each class that exhibit similar characteristics. For example, in the case of dehumidifiers, one of the TSLs will likely consist of the candidate standard

level from each of the six classes that has the minimum LCC.

DOE will also attempt to limit the number of TSLs considered for the NOPR by dropping from consideration candidate standard levels that do not exhibit significantly different economic and/or engineering characteristics from candidate standard levels already selected as a TSL. For example, in the case of dishwashers, the candidate standard level with the minimum LCC is candidate standard level 3 with an EF of 0.65. If the sole consideration for selecting TSLs was LCC, DOE would likely drop candidate standard level 4 with an EF of 0.68 as its LCC savings are lower and not significantly different than the value for candidate standard level 3.

DOE specifically seeks feedback on the criteria it should use for basing the selection of TSLs. This is identified as Issue 16 under “Issues on Which DOE Seeks Comment” in section IV.E of this ANOPR.

IV. Public Participation

A. Attendance at Public Meeting

The time, date, and location of the public meeting are set forth in the **DATES** and **ADDRESSES** sections at the beginning of this document. Anyone who wishes to attend the public meeting must notify Ms. Brenda Edwards-Jones at (202) 586-2945.

B. Procedure for Submitting Requests to Speak

Any person who has an interest in today's notice, or who is a representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the public meeting. Please hand-deliver requests to speak to the address shown under the heading "Hand Delivery/Courier" in the **ADDRESSES** section of this notice, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Requests also may be sent by mail, to the address shown under the heading "Postal Mail" in the **ADDRESSES** section of this notice, or by e-mail to Brenda.Edwards-Jones@ee.doe.gov.

Persons requesting to speak should briefly describe the nature of their interest in this rulemaking and provide a telephone number for contact. DOE asks each person selected to be heard to submit a copy of his or her statement at least two weeks before the public meeting, either by hand delivery, mail, or e-mail as described in the preceding paragraph. Please include an electronic copy of your statement, on a computer diskette or CD when delivery is by mail or hand delivery. Electronic copies must be in WordPerfect, Microsoft Word, Portable Document Format (PDF), or text in American Standard Code for Information Interchange (ASCII) file format. At its discretion, DOE may permit any person who cannot supply an advance copy of his or her statement to participate, if that person has made alternative arrangements with the Building Technologies Program. In such situations, the request to give an oral presentation should ask for alternative arrangements.

C. Conduct of Public Meeting

DOE will designate a DOE official to preside at the public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with 5 U.S.C. 553 and section 336 of EPCA. (42 U.S.C. 6306) A court reporter will be present to record the transcript of the proceedings. DOE reserves the right to schedule the order

of presentations and to establish the procedures governing the conduct of the public meeting. After the public meeting, interested parties may submit further comments on the proceedings and any other aspect of the rulemaking until the end of the comment period.

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

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

DOE will make the entire record of this proposed rulemaking, including the transcript from the public meeting, available for inspection at the U.S. Department of Energy, Forrestal Building, Room 1J-018 (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW, Washington, DC, (202) 586-9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding all aspects of this ANOPR before or after the public meeting, but no later than January 29, 2008. Please submit comments, data, and information electronically to the following e-mail address: home_appliance_rulemaking@ee.doe.gov. Submit electronic comments in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format and avoid the use of special characters or any form of encryption. Comments in electronic format should

be identified by the docket number EE-2006-STD-0127 and/or RIN 1904-AB49, and whenever possible carry the electronic signature of the author. Absent an electronic signature, comments submitted electronically must be followed and authenticated by submitting the signed original paper document. DOE will not accept any telefacsimiles (faxes).

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

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

E. Issues on Which the Department of Energy Seeks Comment

DOE is interested in receiving comments on all aspects of this ANOPR. DOE especially invites comments or data to improve DOE's analysis, including data or information that will respond to the following questions or concerns addressed in this ANOPR:

1. Microwave Oven Standby Power

For the NOPR, DOE is considering purchasing, testing, and analyzing microwave ovens to better understand the utility, cost, and cost implications of reducing standby power consumption. Addition of a standby power test to the existing test procedure would be necessary before standby power could be included in an efficiency standard. DOE is considering this approach for microwave ovens because data provided by AHAM suggests that there is an opportunity for significant energy

savings via the reduction of standby power levels. Therefore, DOE requests data and stakeholder feedback on how to conduct an analysis of standby power for microwave ovens. (See section I.D.4.b of this ANOPR for further details.)

2. Product Classes

In accordance with EPCA section 325(p)(1)(A), DOE identified the equipment classes covered under this rulemaking. (42 U.S.C. 6295(p)(1)(A)) Pursuant to EPCA section 325(p)(1)(B), DOE requests comments on these equipment classes and invites interested persons to submit written presentations of data, views, and arguments. (42 U.S.C. 6295(p)(1)(B)) (See section II.A.1 of this ANOPR for further details.)

3. Commercial Clothes Washer Horizontal-Axis Designs

The information available for CCWs suggests that an efficiency of 1.6 MEF and 8.5 WF will be based on horizontal-axis technology. As such, it appears that the incremental costs between 1.60 MEF/8.5 WF and 2.2 MEF/5.1 WF will be constant at the same value as those provided by AHAM for the level 2.0 MEF/5.5 WF. DOE particularly seeks comment on the validity of such an approach. DOE also seeks information about lower-cost alternatives to horizontal-axis designs for levels greater than 1.42 MEF/9.5 WF and lower than 2.0 MEF/5.5 WF. Additionally, DOE seeks information that would allow it to change the energy and water features of the 2.0 MEF/5.5 WF level to allow for manufacturer cost differentiation at the lower (and the higher) levels. Furthermore, DOE seeks comment on how to evaluate potential shifts from vertical-axis technologies to horizontal-axis. (See section II.C.4.d of this ANOPR for further details.)

4. Compact Dishwashers

DOE was unable to obtain incremental manufacturing cost information for compact dishwashers. Therefore, DOE did not analyze compact dishwashers for this ANOPR but expects to set standards for them. DOE requests feedback on how it can extend the results of the analysis for the standard class to compact dishwashers. (See section II.C.4 of this ANOPR for further details.)

5. Microwave Oven Design Options

For microwave ovens, the design options and efficiency levels that DOE analyzed are those identified in the previous rulemaking's analysis, with incremental manufacturing costs scaled by the PPI. DOE requests stakeholder

feedback on the approach of analyzing additional design options that would result in a lowering of the energy consumption of non-cooking features (e.g., standby power), even though the existing test procedure currently does not account for such usage in EF. (See section II.C.3 of this ANOPR for further details.)

6. Technologies Unable to be Analyzed and Exempted Product Classes

There are a number of technologies which DOE was unable to analyze for this ANOPR. Design options associated with these technologies for dehumidifiers, cooking products, and CCWs, while passing the screening analysis, were eliminated from further consideration prior to the ANOPR engineering analysis. In addition, certain product classes were exempted on a similar lack of efficiency data. DOE requests stakeholder input on (1) energy efficiency data for technologies and product classes for which such data does not exist; and (2) potential limitations of existing test procedures. The latter may include such issues as representative usage patterns, ambient conditions, and test equipment. (See sections II.A.1 and II.C.2 of this ANOPR for further details.)

7. Dishwasher Efficiency and its Impact on Cleaning Performance

DOE was not able to identify sources of data showing whether the amount of pre-washing is impacted by dishwasher efficiency. Therefore, DOE believes that, to date, hand-washing or pre-washing habits have not been affected by product efficiency. Because increased dishwasher energy efficiency may require future designs to utilize less water, DOE recognizes the possibility that more efficient dishwashers may degrade wash performance. Therefore, DOE seeks feedback on whether more efficient dishwasher designs will affect cleaning performance, leading to increased hand-washing or pre-washing and, if so, what increase in energy and water use can be expected. (See section II.D.1 of this ANOPR for further details.)

8. Dehumidifier Use

DOE identified several sources of data for estimating the annual use of dehumidifiers. However, DOE gave more weight to data that AHAM provided because they were developed based on the experience of manufacturers. It appears that AHAM's average estimate of 1,095 operating hours per year is the most representative of actual use. DOE requests feedback on whether 1,095 hours per year best represents the use of dehumidifiers.

(See section II.D.2 of this ANOPR for further details.)

9. Commercial Clothes Washer Per-Cycle Energy Consumption

DOE determined the per-cycle clothes drying energy use and the per-cycle machine energy use for CCWs from data in its 2000 TSD for residential clothes washers. DOE requests feedback on whether these per-cycle energy use characteristics for residential clothes washers are also representative of CCW energy use. (See section II.D.4 of this ANOPR for further details.)

10. Commercial Clothes Washer Consumer Prices

DOE identified two distribution channels for CCWs to establish their price to consumers. One channel involved distributors that typically sell to Laundromats, and the other channel involved route operators that typically sell or lease to multi-family building property owners. For purposes of developing the markups and consumer equipment prices for CCWs, DOE based its calculations solely on a distribution channel that involves distributors. DOE believed that the markups and the resulting consumer equipment prices determined for this distribution channel also would be representative of the prices paid by consumers acquiring their equipment from route operators. DOE requests feedback on its views regarding its development of consumer prices for CCWs. (See section II.E.1 of this ANOPR for further details.)

11. Repair and Maintenance Costs

Primarily because it did not receive any specific data on the impacts that standards might have on repair and maintenance costs, DOE did not include any changes in repair and maintenance costs due to standards for any of the four appliance products. DOE requests feedback on its understanding of repair and maintenance costs. (See section II.G.2.b of this ANOPR for further details.)

12. Efficiency Distributions in the Base Case

To accurately estimate the percentage of consumers that would be affected by a particular energy conservation standard level, DOE took into account the distribution of product efficiencies currently in the marketplace. In other words, DOE conducted its LCC and PBP analyses by considering the full breadth of product efficiencies that consumers purchase under the base case (i.e., the case without new energy efficiency standards) to account for those consumers who already purchase more

efficient products. DOE developed base case efficiency distributions for each of the four appliance products based on a combination of data sources and estimates. DOE requests feedback on the data sources and estimates it used for developing its base case product efficiency distributions. (See section II.G.2.d of this ANOPR for further details.)

13. Commercial Clothes Washer Shipments Forecasts

Based on historical data, CCW shipments dropped significantly between 1998 and 2005. Because DOE tied forecasted shipments to the growth in new multi-family construction, DOE forecasted a continued increase in clothes washer shipments over the analysis period (*i.e.*, 2012–2042). However, due to the dramatic drop in shipments seen in the historical data, DOE is uncertain as to whether shipments will continue to increase and requests feedback on the bases for its shipments forecasts for CCWs. (See section II.H.1 of this ANOPR for further details.)

14. Base-Case and Standards-Case Forecasted Efficiencies

Because key inputs to the calculation of the NES and NPV are dependent on the estimated efficiencies under the base case (without standards) and the standards case (with standards), forecasted efficiencies are of great importance to the analysis. DOE forecasted base-case and standards-case efficiencies, believing they remained frozen throughout the analysis period (*i.e.*, 2012–2042). DOE used a “roll-up” scenario to establish the shipment-weighted efficiency for the year that standards are estimated to become effective (*i.e.*, 2012). Under a roll-up scenario, DOE believed that product efficiencies in the base case that did not meet the standard level under consideration would roll up to meet the new standard level. DOE requests feedback on its methodologies for both forecasting efficiencies and estimating the impact that standards have on product efficiencies. (See section II.I.2 of this ANOPR for further details.)

15. Dehumidifier Cost and Efficiency Relationships

DOE defined total installed cost and efficiency relationships for a subset of the six dehumidifier product classes. For purposes of conducting its NIA, DOE applied the cost-efficiency data that were developed for these product classes to those classes for which DOE was unable to develop cost-efficiency relationships due to lack of data.

Specifically, DOE applied the costs developed for the combined 0–35.00 pints/day class to the two individual classes that comprised the combined class—25.00 pints/day and less and 25.01–35.00 pints/day. Further, DOE applied the costs developed for the 35.01–45.00 pints/day and 54.01–74.99 pints/day product classes to the 45.01–54.00 pints/day and 75.00 pints/day and greater product classes, respectively. In its application of total installed costs to those product classes where no cost data were developed, DOE did not interpolate or extrapolate the cost data to account for product efficiency differences between the classes. For example, DOE utilized the exact same total installed costs that were developed for the baseline and standard levels for the 35.01–45.00 pints/day product class to characterize the baseline and standard level total installed costs for the 45.01–54.00 pints/day product class. DOE requests feedback on its approach for characterizing the total installed costs for those dehumidifier product classes in which it was not able to develop cost-efficiency relationships. (See section II.I.3 of this ANOPR for further details.)

16. Trial Standard Levels

For the NOPR, DOE will develop trial standard levels (TSL) from the candidate standard levels for each of the four appliance products. DOE will consider several criteria in developing the TSLs, including, but not limited to, which candidate standard level has the minimum LCC, maximum NPV, and maximum technologically feasible efficiency. From the list of TSLs developed, DOE will select one as its proposed standard for the NOPR. DOE requests feedback on the criteria it should use for basing the selection of TSLs. (See section III of this ANOPR for further details.)

V. Regulatory Review and Procedural Requirements

DOE submitted this ANOPR for review to OMB under Executive Order 12866, “Regulatory Planning and Review.” 58 FR 51735 (October 4, 1993). If DOE later proposes energy conservation standards for any of the four appliance products, and if the proposed rule constitutes a significant regulatory action, DOE would prepare and submit to OMB for review the assessment of costs and benefits required by section 6(a)(3) of the Executive Order. The Executive Order requires agencies to identify the specific market failure or other specific problem that it intends to address that warrants new agency action, as well as assess the

significance of that problem, to enable assessment of whether any new regulation is warranted. (Executive Order 12866, section 1(b)(1)). DOE presumes that a perfectly functioning market would result in efficiency levels that maximize benefits to all affected persons. Consequently, without a market failure or other specific problem, a regulation would not be expected to result in net benefits to consumers and the nation. However, DOE also notes that whether it establishes standards for these products is determined by the statutory criteria expressed in EPCA. Even in the absence of a market failure or other specific problem, DOE nonetheless may be required to establish standards under existing law.

DOE’s preliminary analysis for dishwashers, dehumidifiers, some gas cooking products, and commercial clothes washers explicitly accounts for the percentage of consumers that already purchase more efficient equipment and takes these consumers into account when determining the national energy savings associated with various candidate standard levels. The preliminary analysis suggests that accounting for the market value of energy savings alone (*i.e.*, excluding any possible “externality” benefits such as those noted below) would produce enough benefits to yield net benefits across a wide array of products and circumstances. With the exception of electric and some gas cooking products, these results quantify the percentage of consumers that do purchase more efficient products. DOE requests additional data (including the percentage of consumers purchasing more efficient cooking products and the extent to which consumers of all product types will continue to purchase more efficient equipment), for testing the existence and extent of these consumer actions.

DOE believes that there is a lack of consumer information and/or information processing capability about energy efficiency opportunities in the home appliance market. If this is in fact the case, DOE would expect the energy efficiency for home appliances to be randomly distributed across key variables such as energy prices and usage levels. Although, with the exception of cooking products, DOE has already identified the percentage of consumers that already purchase more efficient products, DOE does not correlate the consumer’s usage pattern and energy price with the efficiency of the purchased product. Therefore, DOE seeks data on the efficiency levels of existing home appliances in use by how often it is utilized (*e.g.*, how many times

or hours the product is used) and its associated energy price (and/or geographic region of the country). DOE plans to use these data to test the extent to which purchasers of this equipment behave as if they are unaware of the costs associated with their energy consumption. Also, DOE seeks comment on additional knowledge of the Federal Energy Star program, and the program's potential as a resource for increasing knowledge of the availability and benefits of energy efficient appliances in the home appliance consumer market.

A related issue is the problem of asymmetric information (one party to a transaction has more and better information than the other) and/or high transactions costs (costs of gathering information and effecting exchanges of goods and services). In the case of appliances, in many instances the party responsible for the appliance purchase may not be the one who pays the cost to operate it. For example, home builders in large-scale developments often make decisions about appliances without input from home buyers, nor do they offer options to upgrade them. Also, apartment owners normally make decisions about appliances, but it may be the renters who pay the utility bills. If there were no transactions costs, it would be in the home builders' and apartment owners' interest to install appliances the buyers and renters would choose on their own. For example, a renter who knowingly faces higher utility bills from low-efficiency appliances would be willing to pay less in rent, and the apartment owner would indirectly bear the higher utility cost. However, this information is not costless, and it may not be in the interest of the renter to take the time to develop it, or, in the case of the landlord who installs a high-efficiency appliance, to convey that information to the renter.

To the extent that asymmetric information and/or high transactions

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

Of course, there are likely to be certain "external" benefits resulting from the improved efficiency of units that are not captured by the users of such equipment. These include both environmental and energy security-related externalities that are not already reflected in energy prices, such as reduced emissions of greenhouse gases and reduced use of natural gas and oil for electricity generation. DOE invites comments on the weight that should be given to these factors in DOE's determination of the maximum efficiency level at which the total benefits are likely to exceed the total costs resulting from a DOE standard.

As previously stated, DOE generally seeks data that might enable it to conduct tests of market failure for products under consideration for standard-setting. For example, given adequate data, there are ways to test for the extent of market failure for commercial clothes washers. One would expect the owners of commercial

clothes washers who also pay for their energy and water consumption to purchase machines that exhibit higher energy efficiency and lower water usage compared to machines whose owners do not pay for the energy and water usage, other things equal. To test for this form of market failure, DOE needs data on energy efficiency and water consumption of such units and whether the owner of the equipment is also the operator. DOE is also interested in other potential tests of market failure and data that would enable such tests.

In addition, various other analyses and procedures may apply to such future rulemaking action, including those required by the National Environmental Policy Act (Pub. L. 91-190, 42 U.S.C. 4321 *et seq.*); the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4); the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*); the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*); and certain Executive Orders.

The draft of today's action and any other documents submitted to OMB for review are part of the rulemaking record and are available for public review at the U.S. Department of Energy, Forrestal Building, Room 1J-018, (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW., Washington, DC, (202) 586-9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of today's ANOPR.

Issued in Washington, DC, on September 17, 2007.

Alexander A. Karsner,

Assistant Secretary, Energy Efficiency and Renewable Energy.

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