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# Revisions to the ENERGY STAR® Criteria for Clothes Washers

## Introduction

On January 1, 2007, the Federal standard for clothes washers will increase from the current minimum Modified Energy Factor (MEF) of 1.04 to a new minimum MEF of 1.26<sup>1</sup>. In light of this new standard, the Department of Energy (the Department) determined it is necessary to examine changing the ENERGY STAR criteria for clothes washers to maintain significant energy savings for ENERGY STAR qualified clothes washers over those only meeting the Federal standard. By eliminating the most inefficient models, the 2007 Federal standard change will automatically decrease the differentiation between ENERGY STAR qualified and non-qualified models. In addition, as shown later in this paper, the market has already surpassed a market share for ENERGY STAR qualified products of 25 percent. The Department wants to determine if higher energy efficiency criteria would provide greater national energy savings, while maintaining the relevance of the ENERGY STAR label for the public. The proposed criteria change also allowed the Department to consider the inclusion of a water factor requirement in the ENERGY STAR criteria to guarantee water efficiency as well as energy efficiency for all qualified products. A water factor requirement allows the quantification of water savings and an appropriate level would maintain the support of utility and regional efficiency partners.

The Department conducted a public process seeking input on the proposed criteria change. This included releasing preliminary analysis on the clothes washer market, hosting a clothes washer stakeholder meeting in Washington, DC, on August 31, 2004, and providing interested parties the opportunity to comment in writing on the various options open to the Department as it moves forward with the criteria change. A synopsis of the comments received can be found in Appendix A of this analysis.

Based on the analysis and comments provided to date, the Department proposes new ENERGY STAR clothes washer criteria of a minimum MEF of 1.72 and a maximum water factor of 8.0 to take effect on January 1, 2007. These criteria will apply to both residential and residential-style commercial clothes washers. This paper will highlight the analysis and reasoning the Department relied upon to reach this conclusion.

## Background

The ENERGY STAR label denotes to the consumer that the product provides significant energy savings over other non-ENERGY STAR products. The process of establishing new ENERGY STAR criteria is designed to protect the value of the ENERGY STAR brand and ensure its continued relevance in the marketplace. In order to achieve this aim, any successful ENERGY STAR criteria change must consider and balance a varied set of objectives, including the assurance that the established criteria:

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<sup>1</sup> MEF is an efficiency metric that accounts for projected dryer usage based on remaining moisture content (RMC). In order to derive the MEF, a new test procedure outlined in Appendix J1 to Subpart B of Part 430 in Title 10 of the Code of Federal Regulations (CFR) is used. The new test procedure, called the Appendix J1 test procedure, replaced the old Appendix J test procedure. The higher the MEF, the more efficient the model.

- provide meaningful differentiation between ENERGY STAR qualified products and those that just meet the Federal standard;
- will result in significant energy savings, both for consumers and the Nation as a whole;
- are cost-effective for consumers;
- provide ample consumer choice, both in terms of number of models and a wide range of manufacturers;
- do not compromise functionality or performance of the labeled product; and
- do not rely on proprietary technologies of one or a small set of manufacturers.

This analysis is all the more important as the Department is being asked to consider the integration of a water factor into the ENERGY STAR criteria. The Department strongly supports the overall goal of reducing water use nationwide; however, it must ensure that any such support be balanced by the need to protect the overall ENERGY STAR objectives outlined above.

## Market Overview

The Department presented an analysis at the August stakeholder meeting that provided a snapshot of the current state of the market for ENERGY STAR qualified products. Additional data provided by stakeholders for the Department to use in subsequent analyses is also included.

Table One illustrates the average MEF has risen substantially since the new test procedure took effect in 2001<sup>2</sup>. The slight dip in the average MEF in 2004 was due to the introduction of several new models at the minimum ENERGY STAR level, but the average MEF increased dramatically in the last six months of 2004. More importantly, Table One reveals a significant increase in the number of models available to consumers at relatively high MEF levels, thus supporting the conclusion that a significant increase in MEF levels can be achieved, while protecting consumer choice.

**Table One: Average MEF Levels for ENERGY STAR Qualified Clothes Washers by Year**

<i>Date</i>	<i>Average MEF</i>	<i>Number of Qualified Products Above Average</i>
January 1, 2001	1.65	23
January 1, 2002	1.65	33
January 1, 2003	1.70	38
January 1, 2004	1.74	45
June 30, 2004	1.73	77
January 8, 2005	1.78	85

According to the latest national retail sales data (2004 quarter three), ENERGY STAR qualified clothes washers now account for more than 30 percent of all clothes washer sales. Qualified clothes washers are available in both horizontal axis (front loading in most cases) and vertical axis (top loading) configurations. Virtually all front-load models and top-load models without agitators are ENERGY STAR qualified. As of January 2005, there are 172 ENERGY STAR qualified clothes

<sup>2</sup> On January 1, 2001, the ENERGY STAR criteria began using MEF as defined in the Appendix J1 test procedure.

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washers manufactured by 20 different manufacturers out of 464 total available models in the marketplace and every leading manufacturer has several qualified models.

This analysis reveals that it is possible to change the ENERGY STAR criteria and preserve consumer choice. The specific new level is a function of the analysis on market share and the number of manufacturers able to provide technologies at the new qualification levels.

ENERGY STAR typically strives to set efficiency criteria representing the top 25 percent of products in the market. The current minimum ENERGY STAR MEF of 1.42 was set in order to capture approximately 25 percent of all available models. This level is 36.5 percent more energy efficient than the current Federal standard of 1.04. As Table Two demonstrates, to achieve both of these aims in the new criteria, ENERGY STAR would need to raise the minimum MEF to 1.72. This MEF would include 60 percent of all models currently qualified and 22 percent of all models currently manufactured. Table Two shows how the current qualified clothes washers fall under a range of MEF levels.

**Table Two: ENERGY STAR and Federal Performance Levels – MEF Level Only**

<b>Modified Energy Factor (MEF) Range</b>	<b>Number of Current Qualified Products Available (as of January 8, 2005)</b>
1.42 – 1.54	45
1.55 – 1.59	3
1.60 – 1.64	3
1.65 – 1.71	17
1.72 – 1.74	11
1.75 – 1.79	9
1.80 – 1.99	51
2.00 and greater	33

## Water Factor Analysis

Stakeholder comments overwhelmingly supported the introduction of a water factor into the ENERGY STAR Criteria<sup>3</sup>. Some initial stakeholder input suggested that by simply raising the MEF, water issues would generally be addressed, thereby obviating the need for inclusion of a water factor. However, the regression analysis conducted by the Department for the previous analysis<sup>4</sup> demonstrated while water factor *tends* to decrease with higher MEF values, the correlation is not very strong and there are many

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<sup>3</sup> Water factor is defined as gallons per cycle per cubic foot. Therefore, a lower water factor indicates less water used per cycle and higher water efficiency. For example, a clothes washer with a volume of 3.0 cubic feet that uses 27 gallons per cycle has a water factor of 9.0. If two machines have the same water factor, the larger unit will use more water. The Federal standard and Appendix J1 test procedure both assume an annual washer usage of 392 cycles per year. Each whole number drop in the maximum water factor saves approximately 1,200 gallons of water per year per unit. The most efficient model in terms of Modified Energy Factor has an MEF of 2.79 and a water factor of 6.01. The top model with a water factor less than 5.5 has an MEF of 2.2.

<sup>4</sup> Located at

[http://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/clotheswash/2ESCWCriteriaAnalysisFinal.pdf](http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/clotheswash/2ESCWCriteriaAnalysisFinal.pdf)

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exceptions. Therefore, raising the minimum MEF level to reduce water usage would not be an effective approach and a separate water factor requirement is needed to guarantee water efficiency among all ENERGY STAR qualified products.

Given this, most water and energy utilities encouraged the Department to adopt a restrictive water factor requirement. Manufacturers generally agreed a preliminary water factor level was needed at this time, but they urged a less stringent level in order to monitor any performance issues with top-loading clothes washer with agitators. The primary concern manufacturers cited with adopting a stringent water factor level is certain levels could reduce the amount of water used in the rinse cycle to the point at which hygiene issues could arise.

The analysis conducted and feedback received by the Department revealed a water factor either below 8.0 or above 9.5 would eliminate any concerns about hygiene. At a maximum water factor of 9.5, it is possible to produce an ENERGY STAR qualified traditional agitator style top-load model that fills the tub twice (once for the wash cycle and once for the rinse cycle), which is the traditional washing method<sup>5</sup>. At a maximum water factor of 8.0, it is impossible to fill the tub twice, thus limiting the qualified models to either front loader technologies or advanced (e.g., agitator-less) top loader models, neither of which have been shown to produce any hygiene issues due to insufficient rinse water.

However, at any water factor level between 8.0 and 9.5, some stakeholders believe manufacturers may try to stretch the traditional top-load technologies and issues involving gray water, rinseability, and hygiene questions may arise. As noted before, ENERGY STAR cannot establish criteria at any level that may lead to compromises in cleaning capability or hygiene of any model bearing the label. Thus, any water factor level between 8.0 and 9.5 is unacceptable to the Department.

## **Other Market Issues**

Two manufacturers suggested splitting the criteria so there is one level for front-load models and one level for top-load models. The Department chooses not to split product criteria as qualified products will be available at a wide-range of price points in both front-load and top-load configurations, so a two-tiered system is not necessary.

Given the potential for ENERGY STAR qualified washers to use significant amounts of water even among models with a high MEF, the Department decided the criteria should be set to include a maximum water factor of 8.0. By doing so, the Department believes the new ENERGY STAR criteria will:

- ensure clothes washer energy savings in addition to dryer savings;
- offer consumers higher operating cost savings;

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<sup>5</sup> Under the old Appendix J test procedure, it was virtually impossible to meet the ENERGY STAR criteria without using substantially less water than a non-qualified model since approximately 90% of the energy used by a clothes washer is used to heat the water. With the new Appendix J1 test procedure, the inclusion of dryer energy makes it possible for an ENERGY STAR qualified clothes washer to use almost as much energy and water as a non-qualified model as long as the remaining moisture content in the clothes is very low. Models achieve low remaining moisture contents through the use of very high spin speeds. These models save substantial energy through shorter drying times, but the savings are only realized when the dryer energy is included.

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- secure stronger support from energy and water utilities who will help influence consumer purchasing decisions;
  - reward manufacturer partners who have made efforts to improve water and energy efficiency; and
  - respond to increasing market interest in water efficiency.

Another concern raised during discussions was raising the minimum MEF and setting a low maximum water factor would result in an unacceptable limit on consumer choice. At a minimum MEF of 1.72 and a maximum water factor of 8.0, there would still be models available at most price points. Currently, the least expensive ENERGY STAR qualified washer has a Manufacturer's Suggested Retail Price (MSRP) of \$430. With the new level, the least expensive qualified model would have an MSRP of \$600. Based on the market effects of past Federal standard and ENERGY STAR criteria changes, manufacturers will develop new, less expensive, models to meet the new efficiency levels by 2007. However, as is the current case, there will still be a price premium for ENERGY STAR qualified clothes washers due to the extra technology and materials necessary.

Finally, some stakeholders commented that 85 percent of consumers prefer top-load washers as evidence for the need to include a top-load option as part of the ENERGY STAR program. Data submitted by the Association of Home Appliance Manufacturers (AHAM) supports the claim that 80-85 percent of all models sold are top-loaders with agitators (the traditional wash system used in top-load washers), 10-20 percent of all sales are front-loaders, and less than 5 percent of sales are top-loaders without agitators<sup>6</sup>.

Although the percentage of top-load purchases is still very high, the market share has declined in the past seven years since an ENERGY STAR criterion for clothes washers was introduced. The initial sales data collected in 1997 showed a market share for ENERGY STAR qualified clothes washers of 0.2 percent. (At that time, all qualified models were front-loader technologies.) As noted above, the current market share of front loaders is between 10 and 20 percent nationally, and much higher in regions with active energy efficiency programs. For example, New Hampshire, Vermont and Connecticut all have ENERGY STAR qualified clothes washer market share rates of more than 50 percent and Minnesota, Oregon, Massachusetts, and Wisconsin all have ENERGY STAR qualified clothes washer market penetration rates of more than 45 percent. It is possible the difference is made up solely based on sales of ENERGY STAR qualified top-load washers, but it seems to suggest consumers can and will embrace new washer technologies with strong consumer education efforts as familiarity grows. For that reason, the Department is not convinced the program needs to separate categories based on prescriptive design approaches.

Table Three shows the number of top-load models that would remain in the program with a higher MEF. At an MEF of 1.72, only five current top loader models would qualify for the ENERGY STAR designation. Of these models, two contain an agitator and thus would not be able to qualify for the ENERGY STAR designation with an 8.0 water factor. Three top load models would qualify<sup>7</sup>.

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<sup>6</sup> The top-loaders without agitators are the Whirlpool and Kenmore Calypso, the Maytag Neptune TL, the GE Harmony, and the Staber. The least expensive of these models is the Calypso with a suggested retail price of \$850

<sup>7</sup> The Ecosmart has a water factor of 8.45 while the Intuitive has a water factor of 12.86. Among the other top-load models, the Calypso has an MEF of 1.69 and a water factor of 8.11. The Maytag TL has an MEF of 1.74 and a water factor of 7.82. The Staber has an MEF of 1.74 and a water factor of 6.28. The Fisher and Paykel Ecosmart with an agitator has an MEF of 1.91 and a water factor of 8.45. Finally, the new GE Harmony has an MEF of 1.98 and a water factor of 7.08.

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**Table Three: Number of Qualified Top-Load Products by Configuration at Various MEF Levels**

Modified Energy Factor	Total Top-Load Models Available	Top-Load Models with Agitator Available	Top-Load Models without Agitator Available
1.42	43	36	7
1.60	8	2	6
1.72	5	2	3
1.80	3	2	1
2.00	0	0	0

While only three top loaders without agitators would remain in the program at this time, past experiences with ENERGY STAR leads the Department to conclude manufacturers will continue to apply their considerable capacity for innovation to produce more models that will qualify in the almost two years between the announcement of this criteria and the effective date of January 1, 2007.

## Energy and Water Savings Analysis

As noted earlier, one of the key considerations for establishing ENERGY STAR criteria is ensuring energy savings are significant on both a per unit and nationwide basis. For the water savings analysis, a baseline water usage of 16,026 gallons of water was used. This usage is based on the maximum water consumption of a currently available product meeting the 2007 Federal standard minimum MEF of 1.26 in the ENERGY STAR clothes washer database<sup>8</sup>. Maximum water consumption numbers were used for both the baseline and the ENERGY STAR product usages, since model weighted consumption numbers are not available for either. Although there will be many non-qualified products that do not use 16,026 gallons of water per year, there will also be many ENERGY STAR qualified products that have water consumption levels far below the maximum water factor.

The baseline electricity use of 460 kWh/year was identified by the maximum energy usage of a product meeting the 2007 federal standard. Both the electric and water savings compared the baseline levels to a product at the listed MEF and water factor levels as opposed to including all products above those levels. The last two columns show where the current and 2007 Consortium for Energy Efficiency (CEE) tiers fall.

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<sup>8</sup> D&R International, model used has a water factor of 11.85 and a tub capacity of 3.45 cubic feet.

**Table Four: Number of Qualified Products and Potential Savings based on Various Levels of Modified Energy Factor and Water Factor**

Minimum Modified Energy Factor (MEF)	Maximum Water Factor	Qualified Products Available (as of January 8, 2005)	Average Volume (cubic feet)	Number of Original Equipment Manufacturers	Approximate Savings Compared to Federal Standard <sup>9</sup>		CEE Tier (Current)	CEE Tier (2007)
					Electric (kWh/year)	Water (gallons per year)		
1.42	9.5	135	2.7	17	40	5,971	Tier 1	
1.60	9.5	119	2.7	16	210	5,971		
1.60	8.5	101	2.7	16	210	7,030	Tier 2	
1.60	7.5	84	2.7	14	210	8,088		
1.60	6.5	75	2.8	13	210	8,892		
1.72	9.5	99	2.7	16	235	5,971		
1.72	8.5	91	2.8	16	235	6,696		
1.72	8.0	82	2.8	15	235	7,245		
1.72	7.5	78	2.8	14	235	7,794		
1.72	6.5	70	2.8	13	235	8,892		
1.80	9.5	81	2.8	14	266	5,599		
1.80	8.5	81	2.8	14	266	6,696		
1.80	7.5	73	2.8	13	266	7,794	Tier 3A	Tier 1
1.80	6.5	66	2.8	12	266	8,892		
1.80	5.5	54	2.9	9	266	9,774	Tier 3B	
2.00	6.0	29	2.8	6	280	9,440		Tier 2
2.00	5.5	27	2.9	5	284	9,774		
2.20	4.5	2	3.0	1	282	10,734		Tier 3

Tables Five and Six show the potential national energy savings of raising the minimum MEF to 1.72 and assumes an ENERGY STAR market penetration of 15 percent<sup>10</sup>. Table Five combines the average electric savings for the 41.2 percent of households that have electric water heating with the savings from machine energy usage for the 58.8 percent of households that have gas water heating to produce a national “average” electricity savings for electricity. Table Six shows the additional gas water heating savings that would be produced by the 58.8 percent of households that have gas water heating.

<sup>9</sup> D&R International.

<sup>10</sup> The 15% market penetration is considered a baseline or worst-case scenario since the AHAM shipment data shows that already 10-20% of clothes washer shipments are front-load models, most of which would qualify.

Full year 2003 shipments of 8.15 million units were used to estimate total clothes washer sales. The baseline kWh/year was determined based on a model meeting the 2007 Federal minimum MEF of 1.26. The ENERGY STAR kWh/year assumes a model at the minimum MEF level of 1.72.

**Table Five: Electric Savings - MEF of 1.72 and 15% ENERGY STAR Market Penetration**

<b>ENERGY STAR Shipments (15% penetration)</b>	<b>NAECA (kWh/year)</b>	<b>ENERGY STAR (kWh/year)</b>	<b>Savings per Unit (kWh/year)</b>	<b>National Aggregate (MWh/year)</b>
1,221,870	217	65	152	185,724

**Table Six: Gas Savings - MEF of 1.72 and 15% ENERGY STAR Market Penetration**

<b>ENERGY STAR Shipments (15% penetration)</b>	<b>Baseline (therms/year)</b>	<b>ENERGY STAR (therms/year)</b>	<b>Savings per Unit (therms/year)</b>	<b>National Aggregate (therms/year)</b>
1,221,870	15	7	8	9,774,960

Finally, Table Seven shows the annual water savings assuming the inclusion of a maximum water factor of 8.0 as part of the ENERGY STAR clothes washer criteria. The scenario assumes a 15 percent market penetration, an average capacity of 2.8 cubic feet and a baseline energy use of 16,026 gallons per year.

**Table Seven: Water Savings - Maximum Water Factor of 8.0 and 15% ENERGY STAR Market Penetration**

<b>ENERGY STAR Shipments (15% penetration)</b>	<b>Baseline water use (gallons per year)</b>	<b>ENERGY STAR water use (gallons per year)</b>	<b>Savings/Unit, (gallons per year)</b>	<b>National Aggregate (gallons per year)</b>
1,221,870	16,026	8,781	7,245	8.9 billion

Using these average savings levels, the Department projects the average per unit energy and water savings would be approximately \$45 per year<sup>11</sup> and the payback period would be approximately 6.5 years, which is under the average life expectancy of a clothes washer (eleven years).

## Summary

Since the inclusion of clothes washers into the ENERGY STAR program, the Department of Energy has worked with industry stakeholders to ensure the criteria continues to offer consumers significant energy savings, while helping to encourage new energy-efficient technologies into the appliance market place. This was achieved in 2004 when ENERGY STAR increased the criteria to 1.42 MEF, causing many models with the highest water and energy usage to no longer qualify, while maintaining a very healthy nationwide market share. With the Federal standard changing again on January 1, 2007, it is therefore necessary for the minimum ENERGY STAR criteria to be changed in order to maintain

<sup>11</sup> Utility savings are based on the weighted average savings of an ENERGY STAR qualified clothes washer as compared to a product just meeting the 2007 federal standard. It is assumed that 58.8% of households use gas water heating and 42.4% use electric water heating. The weighted savings per model are 152 kWh/year, 8 therms per year and 7,245 gallons per year. The national utility rates of 8.6 cents per kWh, 91 cents per therm, and 0.4158 cents per gallon were used for a total savings of \$45 per year. A price premium of \$300 is assumed based on the difference in price between the least expensive ENERGY STAR qualified clothes washer (\$600) and the least expensive non-qualified washer (\$300).



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savings versus the new Federal standard. As mentioned earlier, without a change in the ENERGY STAR criteria, the ENERGY STAR criteria will cover many more than the top 25 percent of available models, thus losing any meaningful differentiation between ENERGY STAR qualified products and those just meeting the Federal standard.

A minimum MEF of 1.72 sets the ENERGY STAR criteria at the same percentage difference (36.5 percent) above the 2007 Federal standard as the current ENERGY STAR criteria is above the current Federal standard. A minimum MEF of 1.72 allows the inclusion of both front-load and next generation top-load washers.

Setting a maximum water factor level of 8.0 will eliminate any qualified clothes washer not having any associated water savings as compared to the baseline non-qualified washer. Water savings have become one of the key considerations in cost savings, product marketing, and consumer interest in ENERGY STAR qualified washers, and the Department considers it an essential element of efficiency for this product category. Qualified washers, at an 8.0 water factor, using the most water would be 40 percent more efficient in terms of water use than non-qualified washers. Therefore, including a water factor requirement will ensure all ENERGY STAR qualified washers will save both energy and water. While some stakeholders suggested a water factor of 9.5, a water factor of 8.0 eliminates all inefficient models and allows the ENERGY STAR program to focus resources on the most energy and water efficient clothes washer technologies. In addition, a maximum water factor of 8.0 is necessary for the ENERGY STAR program to continue to receive the support of utilities and market transformation groups, who provide incentives and marketing for ENERGY STAR qualified clothes washers. Setting a higher maximum water factor risks losing that valuable support.

The Department understands industry concern about performance issues involving top-load washers with agitators attempting to meet a restrictive water factor. Also, the Department realizes setting a maximum water factor of 8.0 most likely will prevent any top-load washers with agitators from qualifying, but will allow top-load washers without agitators to still qualify. Given the number of washer models that already qualify for the proposed criteria and the potential innovations in washer technology, setting a maximum water factor of 8.0 will allow partners to focus efforts on the most efficient technologies, while virtually eliminating any possible performance degradation issues.

The Department thanks all partners and stakeholders for their participation in this criteria-setting process and for their valuable and thorough comments. If partners or stakeholders have additional comments or suggestions concerning this ENERGY STAR criteria revision, please submit them to Richard Karney at [Richard.Karney@EE.DOE.GOV](mailto:Richard.Karney@EE.DOE.GOV).

This analysis is based on an examination of currently available models and makes no attempt to predict technological advancements between now and 2007 when the Federal standard is increased. Manufacturers have known of the 2007 Federal standard since January 2001 and will have nearly two years to meet any new ENERGY STAR criteria.

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## Appendix A: Summary of Stakeholder Comments

Following the August 31<sup>st</sup> stakeholder meeting, all interested parties were allowed to respond with comments. Twenty stakeholders submitted comments on both potential MEF levels and on the inclusion of water factor as part of the ENERGY STAR criteria. The comments are all available on the ENERGY STAR product development page at

[http://www.energystar.gov/index.cfm?c=revisions.clotheswash\\_spec](http://www.energystar.gov/index.cfm?c=revisions.clotheswash_spec). The section below gives a broad overview of the main comments broken out by stakeholder type.

### Manufacturers

**AHAM** did not have an official position on either a proposed MEF or a proposed water factor level. AHAM did recommend that the Department thoroughly examine such issues as product utility, performance, and hygiene before adopting any water criteria.

**Alliance Laundry Systems** supported splitting the ENERGY STAR criteria into two tiers with a minimum MEF of 1.42 and a maximum water factor of 10.5 for top-load washers and a minimum MEF of 1.8 and a maximum water factor of 6.5 for front-load washers. Alliance stated the two tiers would allow utilities to set higher rebates on front-loaders while still allowing popular top-load models to qualify.

**BSH Home Appliances** and **Fisher and Paykel** both support a minimum MEF of 1.8 and a maximum water factor of 7.5 which is in line with the new CEE Tier 1 level.

**Maytag** supported an increase in the minimum MEF level to 1.6 and a maximum water factor level of 8.5; although they stated this new criteria would effectively remove top-loading clothes washers from the program and limit consumer choice.

**Whirlpool** also supported the splitting up of the ENERGY STAR criteria into two classes, with a minimum MEF of 1.5 and a maximum water factor of 11.0 for top-load washers and a minimum MEF of 1.75 and a maximum water factor of 7.5 for front-load washers. Whirlpool stated these levels provide a substantial increase in the qualification level while retaining consumer demands for top-loading models, full-size models and excellent cleaning performance. Whirlpool recommended the initial water factor not be overly aggressive since the relationship between water factor and performance is not as well known. Finally, Whirlpool recommends a level that maintains an ENERGY STAR market penetration of 20-25 percent.

### Other Stakeholders

**CEE**<sup>12</sup> submitted their comments to match their new 2007 Tier 1 level of a minimum MEF of 1.8 and a maximum water factor of 7.5. CEE said these levels were necessary in order to guarantee support

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<sup>12</sup> The Consortium for Energy Efficiency members include utilities, statewide and regional market transformation administrators, environmental groups, research organizations and state energy offices. The signatories of these comments were the American Council for an Energy Efficient Economy, Austin Water Utility, BC Hydro, Bonneville Power Authority, California Urban Water Conservation Council, Cape Light Compact, Efficiency Vermont, National Grid, Natural Resources Defense Council, Northeast Energy Efficiency Partnerships, Northwest Energy Efficiency Alliance, NSTAR, Pacific Gas and Electric, Sacramento Municipal Utility District, San Diego County Water Authority, San Diego Gas and Electric, Seattle City Light, Seattle Public Utilities, Southern California Gas, The United Illuminating Company, and the Wisconsin Division of Energy.

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from utilities for ENERGY STAR rebates and promotions. All utilities that submitted comments agreed with CEE's levels, especially the maximum water factor level of 7.5. Similar comments were received from Aquacraft, Inc., the California Urban Water Conservation Council, the City of Austin, Texas, the North Carolina Division of Pollution Prevention and Environmental Assistance, the New York City Department of Environmental Protection, the Planning and Conservation League, the Steering Committee for Water Efficient Products, Tacoma Water, and the Water-Wise Council of New York.

**Natural Resources Canada** recommended a minimum MEF of 1.7 and a maximum water factor level of 9.5 stating a water factor level of 9.5 will allow more products to be qualified, a good range of machine capacity, and a mix of both front-load and top-load systems. Natural Resources Canada also suggested an instant maximum water factor level of 12.0 to eliminate washers that do not save any water from the program.

**The Organization for a Water Efficient Product Labeling Program** preferred a nationally recognized separate water label.

**Procter and Gamble** expressed concerns over the performance of top-loading machines if they attempt to meet a minimum MEF of 1.8 and a maximum water factor of 7.5.