Potential Changes to Energy Star Criteria for Residential Dishwashers

Stakeholders Meeting
Washington, DC
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Steering Committee for Water Efficient Products

- A coalition of businesses, drinking water utilities, environmental advocates, and others with a common interest in promoting more efficient use of water. . .

- Dedicated to the establishment of a water-efficient product labeling program that is national in scope and encompasses a wide range of consumer products and commercial equipment that use water. . .

- All have endorsed the *Position Statement in Support of a Voluntary Water Efficient Product Labeling Program*.

The Water Infrastructure Gap

- According to EPA, the water and wastewater infrastructure investment gap may grow within 15 years to levels of --
  - $102 billion for drinking water infrastructure, and
  - $122 billion for wastewater infrastructure.

- Many issues need to be addressed, including maintenance issues, water accounting methods, and rational pricing for water and wastewater service.

- Nevertheless, making more efficient use of water is an *essential component* of the national effort to close the water and wastewater infrastructure investment gap.

Why Dishwashers ?

Residential dishwashers are responsible for comparable shares of total residential energy use and residential indoor water use, respectively.

- Dishwashers account for 1.4 percent of total residential energy use.[1]
- Dishwashers account for 1.4 percent of indoor per capita water use.[2]

[1] Consortium for Energy Efficiency, Super-Efficient Home Appliances Initiative, *Dishwashers* fact sheet.

[2] Mayer et al, *Residential End Uses of Water*, AWWA Research Foundation, 1999. Note: This is the share of indoor use for all homes studied, including homes *without* dishwashers (25% of total). The share of per capita indoor water use in homes *with* dishwashers would likely approach 2%.

Why Dishwashers? – cont'd.

Recent data suggest that water consumption and energy consumption in efficient dishwashers may *not* be as tightly correlated as previously thought.

- The Oregon Dept. of Energy has posted the EFs and water consumption for over 200 models of dishwashers that qualify for Oregon's energy tax credits, i.e., minimum EF of 0.61 and maximum water use of 6.5 g/c.
- Among the 99 models listed with an EF of 0.62, the water consumption of the models that use the most water (1,355 gals./yr) is 75% higher than that of the models that use the least water (769 gals./yr).
- In some manufacturers' offerings, water efficiency decreases in more energy-efficient models.

Why Dishwashing?

A substantial amount of water is used by consumers for pre-rinse activity that manufacturers believe to be *unnecessary*.

- More than 70% of households pre-rinse their dishes with water before placing them in the dishwasher.[1]
- Most water used for pre-rinse is either warm or hot.[2]
- Manufacturers do not recommend pre-rinsing of dishware before placement in new dishwashers today.[3]

[1] Arthur D. Little, Inc., *Review of Survey Data to Support Revisions to DOE's Dishwasher Test Procedure*, 2001.

[2] Dethman & Associates, *Dishwasher Survey Report*, submitted to Northwest Energy Efficiency Alliance and the Consortium for Energy Efficiency, 1999.

[3] For example, Whirlpool's dishwasher use & care guides indicate: "It is not necessary to rinse the dishes before putting them into the dishwasher."

Pre-Rinse Savings Potential

Kitchen faucets are responsible for about 10% of total indoor water use.

- Total faucet use averages 10.9 gallons per capita/day.[1]
- Of this, kitchen faucet use comprises about 7 gallons per capita/day [2], or about 19 gallons per household/day.
- A reduction of even 1 gallon per day (i.e., less than ½ gallon per meal) in pre-rinse water use would be comparable to reducing the water used by an efficient dishwasher by 20 to 25%.

[1] Mayer et al, *Residential End Uses of Water*, AWWA Research Foundation, 1999.

[2] Mayer, private communication, 2005. Derived from subtraction of lavatory faucets (3.4 gpcd) and utility sink faucets.

Recommendations for Action for Improving Water Efficiency

1. For Energy Star Dishwasher machine efficiency –

- Collect and post water consumption data for all Energy Star dishwashers with EF of 0.62 or higher.
- Do a regression analysis on this energy and water data.
- Consider EF 0.62 and WF 6.25 gal/cycle as a rebuttable presumption for new Energy Star criteria.
- Consult with EPA's Water Office.
- Adopt a Water Factor to accompany the new EF.
- Consider a second stage increase in EF & WF for 2008, and consider Energy Star criteria for compact DWs.

Recommendations for Action for Improving Water Efficiency (cont'd)

2. For dishwasher and consumer pre-rinse efficiency, identify better options for consumer education about pre-rinse, and add them to the Energy Star program eligibility criteria where practical. Options should include –

- Reposition guidance on pre-rinse in new Energy Star dishwasher users' manuals and in p-o-p materials;
- Pack a DVD on the pre-rinse issue with new machines;
- Revise the *Partner Commitments* for Energy Star dishwashers to incorporate references to water efficiency as well as energy efficiency, and to include commitments to address the pre-rinse issue in future advertising for Energy Star dishwashers;
- Develop a dishwasher-specific call to action or tagline regarding pre-rinse for use with the Energy Star mark.

Recommendations for Action for Improving Water Efficiency (cont'd)

3. For further improvements in Energy Star dishwasher and consumer pre-rinse efficiency, DOE should –

- conduct studies to document pre-rinse water use, and to quantify the relative energy and water consumption of manual vs. machine pre-rinse;

- consider steps to improve the efficiency and utility of machine pre-rinse to further obviate the perceived need for manual pre-rinse, such as inclusion of pre-rinse use into the DOE dishwasher test procedure, encouraging attention to efficiency in the design of the pre-rinse cycle.

Consumer education efforts should be further refined on the basis of these new data.

Energy Star Dishwasher Water Savings Potential

Assumptions:

- Dishwasher sales = 7.1 million/yr.
- Energy Star = 40% market share
- Energy Star machines after 5 years = 14.2 million
- Incremental machine savings = 3.75 gal/cycle
- Pre-rinse savings = 1 gal/day

Savings after 5 years:

- From machine Water Factor = 31.4 Mgd (35,100 af/yr)
- From pre-rinse = 14.2 Mgd (15,900 af/yr)

Together, after 5 years, water savings equal to the water needs of 100,000 households, or about 265,000 people.