



# **ENERGY STAR<sup>®</sup>**

## **Residential Dishwashers**

***Draft 2 Version 5.0***  
**Stakeholder Webinar**

**February 22, 2011**



Learn more at [energystar.gov](http://energystar.gov)

# Agenda

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## 1. Welcome/ Goals

*Amanda Stevens, US EPA*

## 2. Draft 2 Specification Changes: Summary & Discussion

*Ryan Fogle, D&R International*

## 3. Conclude & Next Steps

*Amanda Stevens, US EPA*

# Meeting Goals

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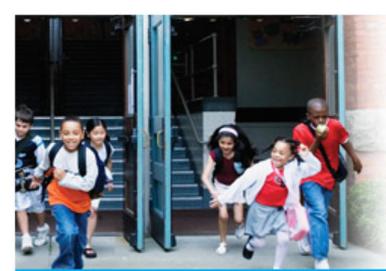
- Highlight changes in the Draft 2 Version 5.0 specification
- Solicit feedback on proposed changes to:
  - i. Energy and water consumption requirements
  - ii. Cleaning performance requirements
  - iii. Other outstanding issues
- Address stakeholder questions about the specification process
- Identify next steps and timeline



# Summary of Changes to Draft 2, Version 5.0



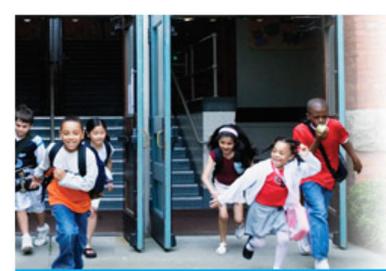
- Modified Efficiency Requirements for Standard Dishwashers:
  - *Draft 1 Proposed Levels:* 280 kWh/year & 4.0 gallons/cycle
  - *Draft 2 Proposed Levels:*
    - Tier 1: 295 kWh/year & 4.25 gallons/cycle
    - Tier 2: 280 kWh/year & 4.0 gallons/cycle
- Cleaning Performance Reporting & Requirements
  - Tier 1: Reporting required, no minimum performance criteria
  - Tier 2: Reporting required, with minimum performance criteria
- Revised product definitions and sampling requirements
- Updated Timeline:
  - Tier 1 Effective Date: January 1, 2012
  - Tier 2 Effective Date: January 1, 2013



# Definitions



- Definitions harmonized with DOE definitions:
  - Residential Dishwasher, with the exception of the phrase “*used in a residential setting*” to distinguish from dishwashers eligible for ENERGY STAR Commercial Dishwasher program.
  - Compact and Standard Dishwasher
  - Basic Model
- New definitions have been added:
  - Portable dishwasher (per AHAM DW-1-2009)
  - Soil-Sensing and Non-Soil-Sensing Dishwashers (per DOE)
  - Average Cleaning Index (per AHAM DW-1-2009)



# Test Requirements & Model Numbers



- EPA has amended ENERGY STAR sampling requirements to harmonize with DOE sampling requirements for the certification of Basic Models.
  - In Draft 2 V5 spec, EPA proposed citing 10 CFR 430.63, Subpart F, which references 10 CFR 430.24.
  - Since then, DOE has published a Final Rule, relocating those sampling plans to 10 CFR 429.19.
- Clarified that model numbers used for ENERGY STAR qualified products should be the same as those submitted to FTC and DOE.

# Proposed Draft 2, V 5.0 Criteria – Energy and Water



Product Type	Tier 1 (Effective January 1, 2012)	Tier 2 (Effective January 1, 2013)
Standard-Size Dishwashers	$\leq 295$ kWh/year $\leq 4.25$ gallons per cycle	$\leq 280$ kWh/year $\leq 4.0$ gallons per cycle
Compact Dishwashers	$\leq 222$ kWh/year $\leq 3.5$ gallons per cycle	$\leq 200$ kWh/year $\leq 2.75$ gallons per cycle



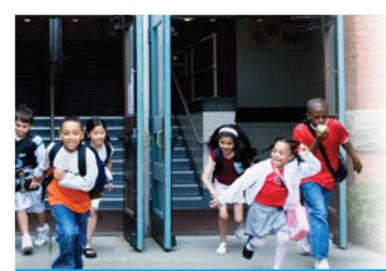
# Annual Unit Savings

## *Energy and Water*



Efficiency Level (ENERGY STAR)	Unit Energy Savings with Electric Water Heating (kWh/year)	Unit Electricity Savings with Gas Water Heating (kWh/year)	Unit Gas Savings with Gas Water Heating (Therms/year)	Annual Water Savings (gallons/year)
Draft 2, V5, Tier 1	60	26	1.5	484
Draft 2, V5, Tier 2	27	12	0.7	215

Note: The average number of cycles per year is 215. The baseline used for the Draft 2, V5, Tier 1 is the current federal standard of 355 kWh/year and 6.5 gallons/cycle. The Draft 2, V5, Tier 2 savings are measured against the proposed AHAM/Advocate group negotiated federal standard of 307 kWh/year and 5.0 gallons/cycle.



# Lifetime Unit Savings *Dollar*



Efficiency Level	Unit Energy Savings with Electric Water Heating	Unit Electricity Savings with Gas Water Heating
Draft 2, V5, Tier 1	\$100	\$81
Draft 2, V5, Tier 2	\$45	\$37

Note: Dollar values are calculated using national averages for electricity and water rates. The average national electric rate is \$0.1068 kWh. The average national gas price is \$1.102/Therm. The average national water rate is \$0.007501 per gallon. A lifetime of 10 years was used for the lifetime savings. The baseline used for Draft 2, V5, Tier 1 is the current federal standard and the baseline used for the Draft 2, V5, Tier 2 is the AHAM/Advocate negotiated standard.

# Price Differential



Efficiency Level	Price	Source
Federal Standard (355/6.5)	\$220-250	Typical baseline dishwasher
ENERGY STAR V4.1	\$250	Lowest price available
Draft 2, V5, Tier 1	\$399 (On sale)	Frigidaire FGHD2433***: 283 kWh/yr 3.68 gallons/cycle. <i>[Bestbuy.com, 2-15-2011]</i>
Draft 2, V5, Tier 2	TBD	TBD

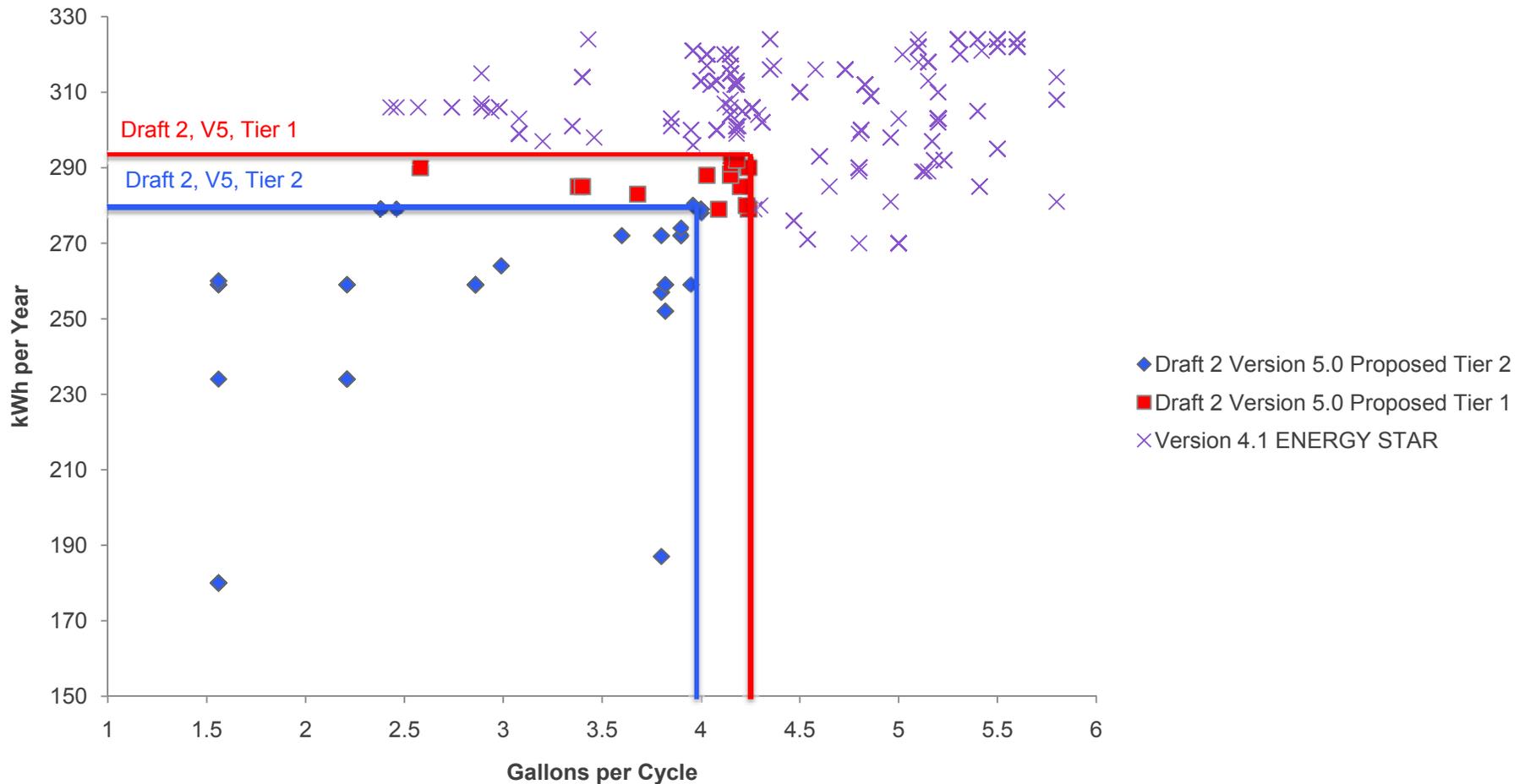
- EPA believes that cost-competitive ENERGY STAR choices will be available.
  - Many efficient dishwashers have high-end features bundled in.
  - In past specification changes the price premium was less than the originally cited cost.



# ENERGY STAR Standard DW Scatter Plot



## ENERGY STAR Standard Dishwasher Scatter Plot

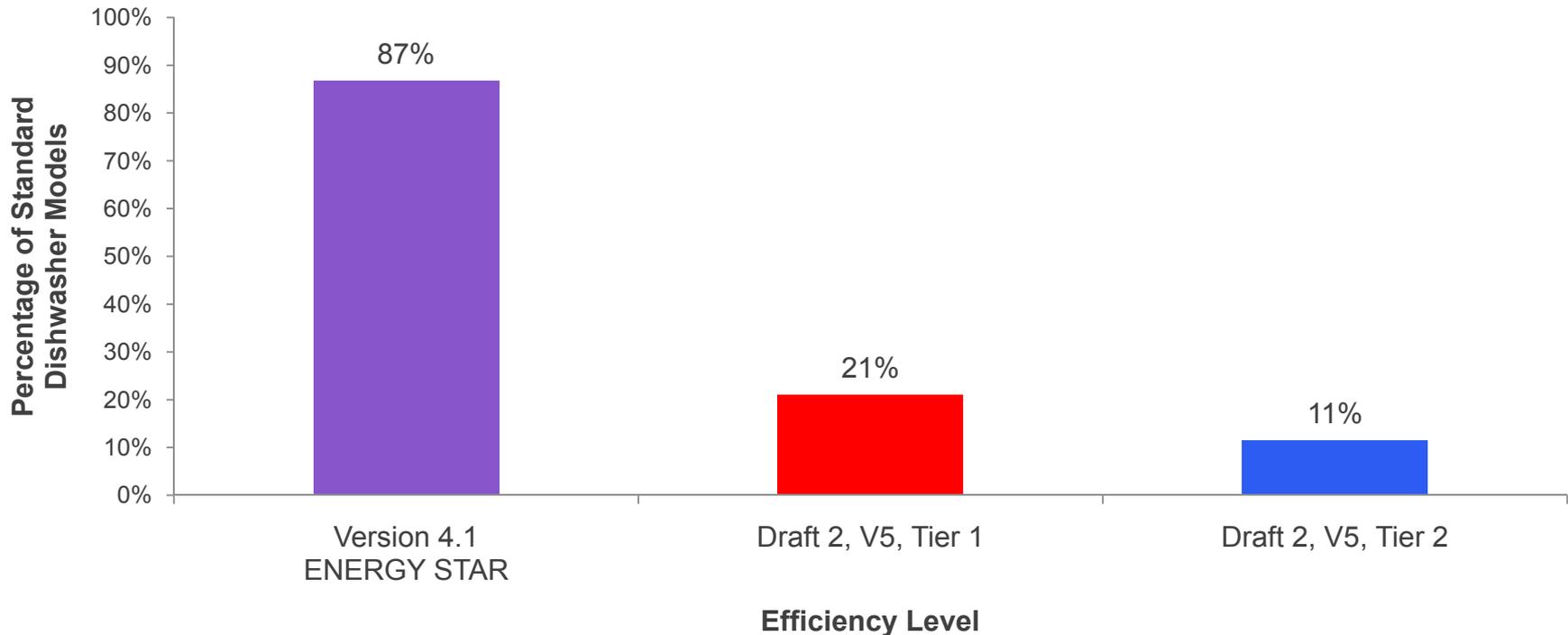




# Product Availability



### Percentage of Standard Dishwasher Models that Qualify at Different Efficiency Levels



**Note:** Based on 2010 annual reports to the Federal Trade Commission and the latest information available on the ENERGY STAR website there are 20 manufacturers that produce 566 models under 46 different brand names.



# Current Product Availability by Brand



**Draft 2, Tier 1 Proposed Levels**  
 $\leq 295$  kWh per year  
 $\leq 4.25$  gallons per cycle

Asko (10)	Fisher and Paykel (2)	Kitchenaid (Whirlpool) (14)
Avanti (3)	Frigidaire (Electrolux) (8)	LG (6)
Bosch (36)	Gaggenau (Bosch)(4)	Maytag (Whirlpool) (6)
Dacor (3)	GE Monogram (2)	Samsung (4)
Danby (3)	Ikea (Whirlpool) (2)	Thermador (Bosch) (2)
DCS (1)	Jenn-Air (Whirlpool) (2)	Whirlpool (1)
Electrolux (1)	Kenmore (10)	

\* Number of models listed on the ENERGY STAR qualified product list are noted in parentheses.



# Cleaning Performance Test Considerations



	Benefits	Disadvantages
<b>AHAM DW-1-2009</b>	<ul style="list-style-type: none"><li>-Widely used by US manufacturers</li><li>-Soil load (1992 version) is used in the DOE test</li></ul>	<ul style="list-style-type: none"><li>-Has not been subjected to round-robin testing</li><li>-Not as likely to generate repeatable/reliable results as IEC test</li></ul>
<b>IEC 60436 3<sup>rd</sup> Edition</b>	<ul style="list-style-type: none"><li>-More likely to generate repeatable and accurate results</li><li>-Has undergone round-robin testing</li></ul>	<ul style="list-style-type: none"><li>-Is not widely used in the US</li><li>-Test requires some changes to be more widely used in US</li></ul>

**Note:** EPA is aware of AHAM’s intent to harmonize DW-1 with IEC 06436. EPA supports this initiative for U.S. harmonization with international test standards and believes that the industry is best positioned to develop a U.S. localization of IEC 60436.





# Tier 1 Cleaning Requirement



- Cleaning performance testing and reporting is required for all ENERGY STAR qualified products.
  - The results of the test along with test reports, will be submitted to EPA.
  - No minimum performance requirement.
  - EPA will not publish the results on the QPL.
- Cleaning performance will be tested using the current DOE test procedure.
  - A minimum of two soil runs on the “sensor heavy response” load for both soil sensing and non-soil sensing dishwashers.
  - Cleaning performance evaluated per DW-1-2009.
  - Allows for the concurrent testing of energy, water, and cleaning performance.



# Tier 2 Cleaning Requirement



- Tier 2 will include a minimum cleaning performance criteria. Test method is TBD.
  - Testing and product qualification will need to be performed in accordance with all aspects of ENERGY STAR 3<sup>rd</sup> Party Certification ([www.energystar.gov/3rdpartycert](http://www.energystar.gov/3rdpartycert)).
  - Cleaning performance scores will be evaluated on a pass/fail basis.
    - This is a correction from Draft 2 (lines 112 and 113)
- EPA will conduct a separate stakeholder process to define and implement the minimum cleaning performance requirements.



# Smart Dishwashers



- EPA favors “smart” features that can provide consumer with feedback (through 2-way communication) and enhanced support through maintenance/diagnostic features.
  - To accommodate any additional energy required for 2-way communications, EPA would consider an adder. Requests stakeholders share data on this energy use so an appropriate allowance could be determined.
- EPA believes these types of smart features can create a foundation from which Demand Response (DR) ready functionality can be added at a low cost, and employed when it offers consumers benefit (e.g., if and when a consumer has variable rates).
- EPA does not plan to incorporate smart grid ready requirements into the dishwasher specification during this spec revision.



# Anticipated Timeline



February 2, 2011	Draft 2 specification proposed
February 22, 2011	Stakeholder Webinar to discuss Draft 2
March 4, 2011	Comments on Draft 2 specification due
March-April 2011	Final Draft specification proposed; stakeholder meeting or webinar; and comment period.
January 1, 2012	Tier 1 specification is effective
Late 2011-Early 2012	Cleaning Performance Reassessed via Stakeholder Process
January 1, 2013	Tier 2 specification is effective

- EPA welcomes all partner and stakeholder comments by **March 4, 2011**
- Comments should be submitted in writing to [appliances@energystar.gov](mailto:appliances@energystar.gov)



# Contacts



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