Dishwashers: Defining Key Aspects of ENERGY STAR® Customer Satisfaction

Melissa Fiffer, U.S. EPA
Roadmapping Webinar
March 23, 2016
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Appliance Roadmapping Goals

• Build on more than 20 years of partnership to foster the future success of the ENERGY STAR program for appliances

• Look ahead creatively to the next five years, with the goal of maintaining an ENERGY STAR appliance program that delivers on consumer expectations for performance and efficiency

• Establish pathways to further engagement between EPA ENERGY STAR, appliance manufacturers, retailers and energy efficiency program sponsors on an ongoing basis

• Charting progress and identifying consumer value of connected functionality
Appliance Roadmapping: Where are we now?

Late 2015

- Kick-off session at ENERGY STAR Products Partner Meeting
- Launch of roadmapping web site
- Release of draft outline of upcoming appliance spec revisions

Winter/Spring 2016

- Webinars scheduled for Jan-May on topics inc. customer satisfaction, connected, and consumer messaging.
- We are open to exploring other topics of mutual interest to EPA, utilities, manufacturers, and retailers.
- We are open to forming working groups to continue the conversation on any of the webinar topics where there is more in-depth interest.

Summer/Fall 2016

- We are open to hosting in-person meeting(s) this summer for working group topics where there is interest/relevance.
- We expect to culminate the appliance roadmapping effort with an in-person meeting at the Oct 2016 ENERGY STAR Products Partner Meeting.
Agenda for Today’s Webinar

• Discussion of key dishwasher performance factors
  – Abroad
  – In the U.S. market
• Discussion of dishwasher technology and features
• ENERGY STAR and dishwasher performance
• Next steps for dishwasher roadmapping
Dishwasher Performance Considerations

- Energy use
- Water use
- Capacity/Flexibility
- Cleaning ability
- Rinsing ability
- Noise
- Drying
- Cycle time
Key Performance Factors in Other Countries

- All European household dishwashers are scored on energy, cleaning, and drying efficiency indices. They bear a label indicating:
  - Noise emission
  - Drying efficiency class (ABCDEFG)
  - Rated Capacity
  - Annual energy and water consumption

- Australia Water Efficiency Labelling and Standards (WELS) program tests for:
  - Water Efficiency
  - Washing and drying effectiveness
  - Cleaning performance thresholds must be met in order to be registered and labeled.
Discussion – Key Performance Factors in the U.S.

Which factors are most important to U.S. consumers?

- Cleaning
- Rinsing
- Noise
- Energy Efficiency
- Water Efficiency
- Cycle time
- Drying
- Capacity
- Flexibility
Highlights of Dishwasher Technology and Features

- Sensors (Soil sensor)
- Improved motors
- Improved fill control
- Gray water rinse
- Reduced inlet-water temperature
- Ultrasonic washing
- Microprocessor controls and fuzzy logic
- Increased Insulation
- Low standby loss of electric controls
- Flow-through heating
- Fan drying

- Condenser dryer
- Improved water filters
- Variable washing pressure and flow rates (based on cycle selection)
- Connected features
- Tub material

How might these technologies and features impact efficiency? Cost? Performance?

Are there other market trends we should be aware of?
ENERGY STAR Dishwasher Criteria

- Our goal: Use ENERGY STAR to promote energy efficient appliances that do not compromise on performance.
  - ENERGY STAR criteria provide consistent definitions and approaches to achieve energy savings.
  - ENERGY STAR is a trusted resource that can help consumers find these advanced products and identify the benefits they offer.

- Reminder: ENERGY STAR labels both standard and compact models.
  - Compact dishwashers include countertop and dishdrawer designs.
## ENERGY STAR Dishwasher Criteria

### ENERGY STAR Version 6.0 (effective January 29th, 2016)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>AEC&lt;sub&gt;Base&lt;/sub&gt; (kWh/year)</th>
<th>Water Consumption (gallons/cycle)</th>
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<tbody>
<tr>
<td>Standard</td>
<td>270</td>
<td>≤ 3.5</td>
</tr>
<tr>
<td>Compact</td>
<td>203</td>
<td>≤ 3.1</td>
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</table>

### ENERGY STAR Most Efficient 2016

<table>
<thead>
<tr>
<th>Product Type</th>
<th>AEC (kWh/year)</th>
<th>Water Consumption (gallons/cycle)</th>
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<tbody>
<tr>
<td>Standard</td>
<td>≤ 240</td>
<td>≤ 3.2</td>
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</table>

AEC = annual energy consumption
Dishwasher Cleaning Performance

• ENERGY STAR Test Method for Residential Dishwasher Cleaning Performance (Rev. Feb-2014)

• Data will not be shared publicly

• Implemented in Version 6.0 as optional:
  – Cleaning Index data can be reported through an EPA-recognized certification body (CB) or directly to EPA

• Required for ENERGY STAR Most Efficient:
  – Cleaning Index data shall be reported through a CB
  – Products must obtain a minimum per cycle Cleaning Index:

<table>
<thead>
<tr>
<th>Test Cycle Type</th>
<th>Cleaning Index</th>
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<tbody>
<tr>
<td>Heavy</td>
<td>70</td>
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<tr>
<td>Medium</td>
<td>70</td>
</tr>
<tr>
<td>Light</td>
<td>70</td>
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</table>
Dishwasher Cleaning Performance Data

- Number of models that have submitted cleaning data

<table>
<thead>
<tr>
<th></th>
<th>Brands</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>ENERGY STAR Most Efficient</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>13</td>
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</tbody>
</table>

- Number of models that meet Most Efficient energy and water criteria, but have not submitted for recognition

<table>
<thead>
<tr>
<th>Brands</th>
<th>Models</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>19</td>
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</table>
Discussion – Dishwasher Closing Comments
Next Steps in the Dishwasher Roadmapping Process

• Further engagement between EPA ENERGY STAR, appliance manufactures, retailers and energy efficiency program sponsors:
  – Working group on dishwasher performance?
  – Additional webinars?
  – In person meetings?
• How can ENERGY STAR help promote performance testing in dishwashers?
Other Upcoming Roadmapping Webinars

• **Connected Appliances: Continued**
  April 7th, 2016 from 1:00-3:00 pm Eastern

• **Collaborating on Consumer Messaging: Educating on Efficient Product Use and Replacement/Recycling**
  May 25th, 2016 from 1:00-3:00pm Eastern

• **Clothes Washer Performance follow-up**
  Stay tuned for updates
  Please feel free to submit workgroup topics
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Thank you for participating!

Check for updates on the Appliance Roadmapping web site