



ENERGY STAR® Water Coolers

Version 3.0 Discussion Guide

Stakeholder Meeting

December 5, 2019





Webinar Participation

- Please mute yourself when you are not speaking (use local mute or dial *6)
- Feel free to ask questions at any time

Written comments can be provided to watercoolers@energystar.gov by **December 19, 2019**

The screenshot displays a software interface for a webinar. At the top, there is a menu bar with 'File', 'View', and 'Help' options. Below this is a 'Audio' control panel. It includes a 'Sound Check' indicator with three green bars and a question mark. Two radio buttons are present: 'Computer audio' (selected) and 'Phone call'. A microphone icon is shown with the word 'MUTED' in orange text. Below this, there are two dropdown menus for 'Transmit (Plantronics Savi 7xx-M)' and 'Receive (Plantronics Savi 7xx-M)'. A volume bar with ten green segments is visible. At the bottom of the audio panel, it says 'Talking: Liz Davis'. To the left of the audio panel is a vertical toolbar with several icons; the icon of a hand with a green dot (representing mute) is highlighted with a red box. Below the audio panel is a 'Questions' panel, also highlighted with a red box. It has a title bar 'Questions' and a text input field containing '[Enter a question for staff]'. A 'Send' button is located at the bottom right of this panel. At the bottom of the interface, the text 'Webinar Housekeeping' and 'Webinar ID: 608-865-371' is displayed, followed by the 'GoToWebinar' logo.



Meeting Agenda

1. Introductions
2. Current Specification
3. Energy Savings Potential
4. Test Method Considerations
5. Clarifying Definitions and Scope
6. Alternative Refrigerants and Foams
7. Data Collection
8. Closing - Next Steps & Questions



Introductions



Tanja Crk, EPA

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Product Manager

Commercial Food Service



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Product Development Lead

Rollcall



What is ENERGY STAR?

The simple
choice for
energy
efficiency.



- Influential and trusted symbol of **energy efficiency**
- Available across **75+ product categories**
- Since 1992, a voluntary **partnership** among government, business, and consumers
- Products are independently certified to meet strict energy-efficiency guidelines set by the **U.S. EPA**
- **Utilities** offer **rebates** on ENERGY STAR certified equipment
- **Saves** end-users **energy, water, and money**
- Helps protect the **climate**

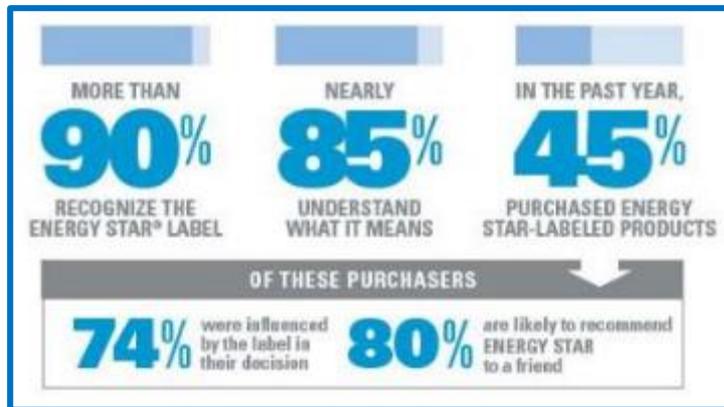


Guiding Principles That Drive Specification Revisions

- Revisions are driven by the need to continuously recognize and differentiate top performing products on the market:
 - Technological advancements
 - Significant increase in ENERGY STAR market penetration, [62% as of [2018 USD Report](#)]
 - Clarifying definitions and scope
 - ENERGY STAR Water Coolers Test Method updates
 - Product performance or quality concerns



Benefits to joining ENERGY STAR?



Source: CEE's 2016 Household Survey

- Leverage the label recognition
- Access customer support teams at EPA
- Apply for the ENERGY STAR Partner of the Year Award
- Utilize co-brandable materials
- Participate in promotional events
- Access a network of over 700 utilities
- Get listed on publicly-available ENERGY STAR search tools
- Receive email notifications about program activities



You Will be in Good Company



Nest





How to join ENERGY STAR?

Depends on partnership type

- Brand owner
- Retailer
- Residential building
- Commercial building, service, product, or association
- Industrial plant, service, product, or association
- Energy Efficiency Program Sponsor

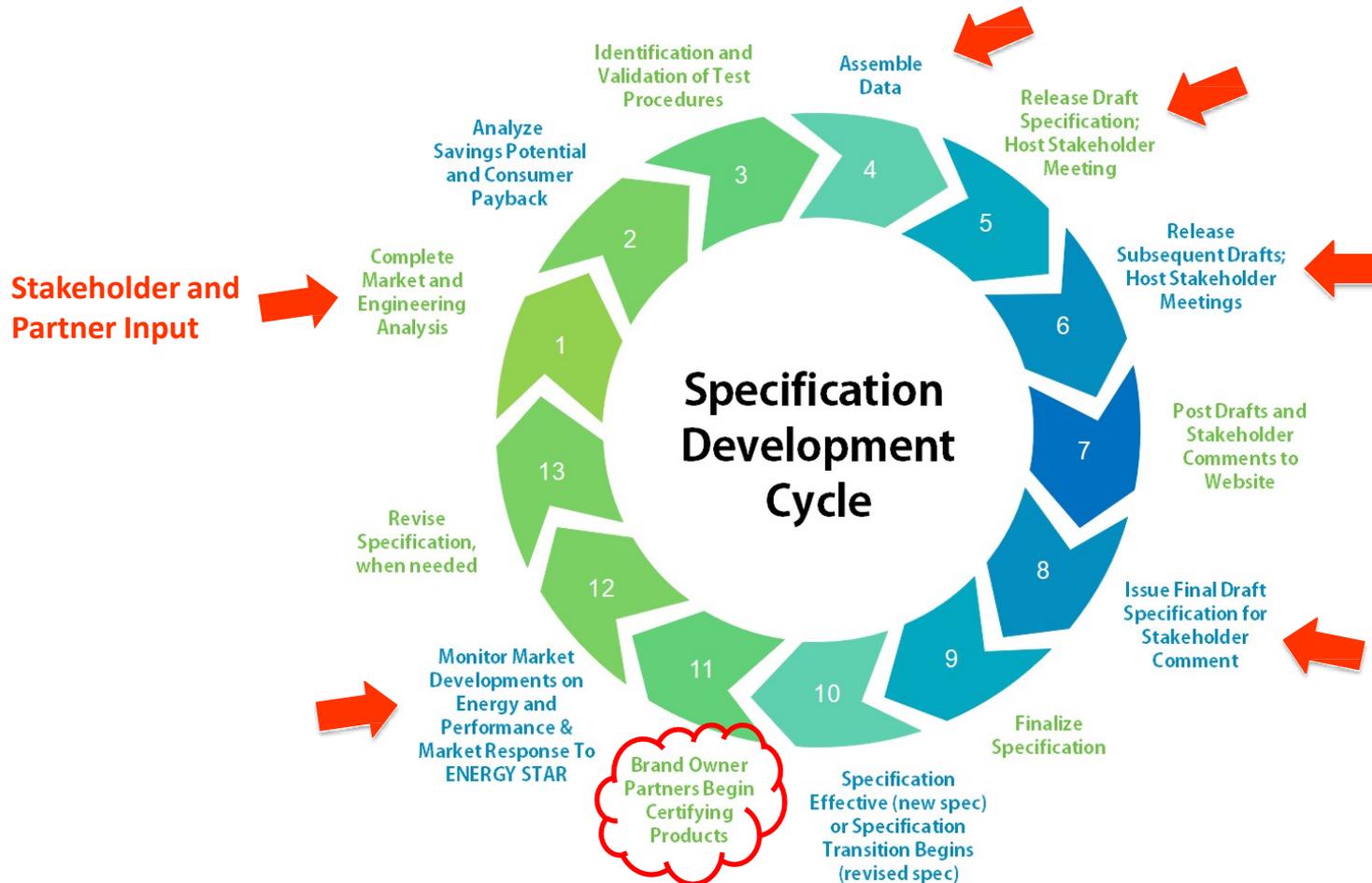
The simple choice for energy efficiency.



For more information visit this webpage https://www.energystar.gov/partner_resources/join-energy-star



ENERGY STAR Specification Development Process





Certifying Products as ENERGY STAR

- **Third-party certification** through an EPA-recognized certification body (CB): www.energystar.gov/3rdpartycert.
- Once an EPA-recognized CB has reviewed and certified the product, the Product Brand Owner will be notified to then proceed with **labeling the product**.
- Newly certified models offered for sale in the U.S. will be posted on the **ENERGY STAR Product Finder**.



ENERGY STAR Product Finder

Search for ENERGY STAR certified products, compare product features, and export data

www.energystar.gov/productfinder

Find and Compare Products
Languages: English | Français
Access to ENERGY STAR API, Data Set or Excel File

Find product models that have earned the ENERGY STAR and compare features, savings and more to optimize your purchase.

- 1 Select a product category of interest to you.
- 2 Get details on specific qualifying models.
- 3 Make informed purchasing decisions.

ENERGY STAR Certified

Commercial Refrigerators and Freezers

Visit the [Commercial Refrigerators and Freezers](#) page for usage tips and buying guidelines.

CHANGE
product category

1032 Records Found

Sort by: Energy Use (kWh/day)

Filter Your Results

Type

- Vertical Solid Door Refrigerator (442)
- Vertical Transparent Door Refrigerator (351)
- Vertical Solid Door Freezer (182)
- Vertical Transparent Door Freezer (43)

IDW - TEQ-77 Compare

Type: Horizontal Transparent Door Refrigerator Configuration (Vertical/Chest): Chest
 Volume (cu. ft.): 2.3 Number of Doors: 1
 Energy Use (kWh/day): 0.26 Refrigerant Type: R-600a

IDW - RCM-VISID Compare

Type: Horizontal Transparent Door Refrigerator Configuration (Vertical/Chest): Chest
 Volume (cu. ft.): 2.19 Number of Doors: 1
 Energy Use (kWh/day): 0.29 Refrigerant Type: R-600a

ENER...	ENERGY STAR Partner	Brand Name	Model Name	Model Number	Additional
2,333,372	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial freezer	VP1F-HC	
2,333,423	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VP1R-23HC	
2,333,370	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VP1R-HC	
2,333,373	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial freezer	VP2F-HC	
2,333,424	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VP2R-48HC	
2,333,371	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VP2R-HC	
2,333,425	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VPUCR27	
2,333,426	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VPUCR48	
2,333,427	Allied Manufacturing, Inc. DBA Valp...	Valpro	Commercial refrigerator	VPUCR60	
2,340,478	Allied Trading Inc.	Padela	PDB-1R-HC	PDB-1R-HC	
2,340,477	Allied Trading Inc.	Padela	PDB-2F-HC	PDB-2F-HC	
2,340,398	Allied Trading Inc.	Padela	PDB-2R-HC	PDB-2R-HC	
2,340,643	Allied Trading Inc.	Padela	PDB-3R-HC	PDB-3R-HC	



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Water Coolers Specification Timeline

- Version 1.0 effective date – August 2000
- Test Method revised – May 2013
- Version 2.0 effective date – February 2014

- Discussion Guide & Data Template issued – November 2019
- Discussion Guide Webinar – December 5, 2019
- Data Assembly deadline – October 15, 2017
- Discussion Guide Comments and Data Template Due Date – December 19, 2019

[Product Development Website](#)



Specification History

- Version 1:
 - Standby Energy Consumption for Cold only and Hot/Cold units
- Version 2 (Current):
 - No water draw measurements as defined in current test method
 - Differentiated Storage vs. On Demand Products
- Version 3 Considerations:
 - Test method vetting
 - Definitions and scope clarifications
 - Criteria refinements



Current Specification – Version 2.0

- Metrics are set for the No Water Draw test only:

Product	kW/Day Standby
Cold Only & Cook and Cold: Storage Type	0.16
Hot and Cold: Storage Type	0.87
Hot and Cold: On Demand Type	0.18



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Market Analysis

We are looking to understand the following to approximate energy use across the market:

- Commercial vs. Residential product sales
- Leased vs. purchased
- Use schedules – Active vs. idle mode



Energy Savings Potential

1. What is the market distribution for water cooler products? What percentage of units are leased vs. directly purchased? What percentage are used in commercial vs. residential settings?



Energy Savings Potential

2. Are there energy performance differences between leased versus sold units and units aimed at commercial versus residential customers? If so, what are the defining characteristics of each?



Energy Savings Potential

3. Are there typical use schedules that manufacturers recommend for estimating yearly savings?
4. What is the anticipated lifetime for these units, including direct purchased and leased products?



Energy Savings Potential

5. Are there any emerging technologies for water coolers (e.g. thermoelastic refrigeration) and best practices for efficient product design in this category? Are there any other trends in this industry that the ENERGY STAR program should consider?



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Test Method Considerations

Test	Type	
On Mode with no Water Draw	All Unit Types	Standby test
On Mode with Water Draw	All Unit Types	Cold water draw for all units, hot water draw for storage
On Mode with Water Draw	On Demand Units	Hot water draw



Test Method Considerations

- On Mode with Water Draw
 - Currently, only this standby power is tested.
 - EPA is considering the defining criteria for water draw tests and evaluating the potential for greater savings



Test Method Considerations

- Water draw temperatures
 - Current test method: Cold water draw at 50°F (10°C), Hot water draw at 165°F (73.9°C)
 - Alternate proposed: 47 °F and 185 °F
 - Stakeholders have indicated these temperatures are not aligned with consumer preferences
 - Changing the temperatures would result in different energy use and would require reexamining the criteria



Test Method Considerations

1. Do manufacturers support revising set point temperatures?
2. How would the alternate proposed dispensed cold and hot water temperatures affect the measured performance and energy consumption of these products?
3. Are there other factors that should be taken into consideration when assessing potential modification to the water coolers test method?



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Definitions and Scope

- Water Cooler Type:
 - Cold Only Units
 - Hot and Cold Units
 - Cook and Cold Units
- Water Storage:
 - Storage
 - On-Demand
 - Compartment – Refrigerated with or without ice
- Water Source:
 - Bottle
 - Point of use



Definitions and Scope

Changes for Version 3.0:

- Clarify that additional product features are within scope
 - Sparkling, flavored, and alkaline water
- Clarify the refrigerated compartment definition and ice maker definition
 - Based on product availability and popularity, will include or amend these categories



New Product Features on Market

New Product features	Would this affect energy use?
Sparkling Water	Only on water draw, possibly
Flavored Water	No
Alkaline Water	No
Ice Maker	Yes, on standby
Custom user interface	Yes, on standby
Other features?	?



Clarifying Definitions and Scope

1. Does the current test method capture the energy use of these features through either the “On Mode with No Water Draw” test or the “On Mode with Water Draw” tests?
2. How does energy use of units with these features vary from that of standard products without these features both in the “On Mode with No Water Draw” test and “On Mode with Water Draw” tests?
3. How prevalent are features such as flavor, integrated sparkling and alkaline?



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Alternative Refrigerants

- EPA has highlighted products with low-GWP refrigerants in several product categories
- Are manufacturers using or researching the use of low-GWP?

Refrigerant Type

- R-134a (46)
- R-290 (3)
- R-404A (12)
- R-410A (8)
- R-600a (22)



Alternative Refrigerants

1. Are water cooler brand owners making use of alternative refrigerants?
2. Do consumers of water coolers seek products with alternative refrigerants? Would it be helpful to partners for EPA to highlight this feature in the ENERGY STAR Product Finder?



Alternative Foams

3. Are water cooler brand owners making use of low-GWP insulating foams, and are there market or regulatory influences to do so?
4. Do consumers of water coolers seek products with low-GWP insulating foams? Would it be helpful to partners for EPA to highlight this feature in the ENERGY STAR Product Finder?
5. Are there any other insulation features to consider in the specification revision for ENERGY STAR Water Coolers?



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Data Collection

- EPA has requested testing data from our partners to understand where levels should be set for different tests or different unit types
- Alternate temperatures – several stakeholders have mentioned a disparity in the ENERGY STAR draw temperatures and consumer preferred temperatures



ENERGY STAR® Water Coolers Test Reporting Template - Unit Under Test (UUT) Information

Unit Under Test General Information		
Manufacturer		
Model Name		
Model Number		
Serial Number		
Production Date		
Rated Output Voltage		V
Rated Output Frequency		Hz
Rated Input Voltage		V
Rated Input Frequency		Hz

Unit Under Test Configuration		
Dimensions - height		in
Dimensions - width		in
Dimensions - depth		in

Unit Under Test Characteristics		
Water Storage Method: Internal Storage, On Demand		
Water Source Type: Bottle, Point of Use (POU)		
Delivered Water Temperature Capabilities: Hot & Cold, Cold Only, Cook & Cold		
Does the unit provide additional dispensing features (i.e., sparkling water, alkaline water, ice)?		
Can energy saving features such as timers or occupancy sensors be disabled?		



ENERGY STAR® Water Coolers Data Template - Measurements

Test Results: On Mode with No Water Draw (Section 7.1)

Recorded No Draw Energy Consumption, $Q_{no\ draw}$		Wh
Recorded No Draw test period, $T_{no\ draw}$		min

Test Results: On Mode with Water Draw - Cold (Section 7.2)	20s Draw	40s Draw	60s Draw	90s Draw	120s Draw	
---	-----------------	-----------------	-----------------	-----------------	------------------	--

Energy Consumed by the UUT, $Q_{cold\ draw}$						Wh
Average Supply Water Temperature, $T_{s,cold}$ (Eq 3)						°F
Average Dispensed Water Temperature, $T_{d,cold}$ (Eq 3)						°F
Mass of Dispensed Water						lbm

If an energy consumptive feature not under consideration cycles on during the test, record the following:

Energy Consumed, $Q_{feature}$						Wh
Average Power Draw, $P_{feature}$						W
Time heater is active, $t_{feature}$						s

Test Results: On Mode with Water Draw - Hot (Section 7.2)	20s Draw	40s Draw	60s Draw	90s Draw	120s Draw	
--	-----------------	-----------------	-----------------	-----------------	------------------	--

Energy Consumed by the UUT, $Q_{hot\ draw}$						Wh
Average Supply Water Temperature, $T_{s,hot}$ (Eq 3)						°F
Average Dispensed Water Temperature, $T_{d,hot}$ (Eq 3)						°F
Mass of Dispensed Water						lbm

If an energy consumptive feature not under consideration cycles on during the test, record the following:

Energy Consumed, $Q_{feature}$						Wh
Average Power Draw, $P_{feature}$						W
Time cooler is active, $t_{feature}$						s

Test Results: On Mode with Water Draw (Section 7.3)	Draw 1	Draw 2	Draw 3	
--	---------------	---------------	---------------	--

Energy Consumed by the UUT, Q_{draw}				Wh
Average Supply Water Temperature, $T_{s,draw}$ (Eq 3)				°F
Average Dispensed Water Temperature, $T_{d,draw}$ (Eq 3)				°F
Mass of Dispensed Water				lbm

If the cooler cycles on during the test, record the following:

Energy Consumed, $Q_{feature}$				Wh
Average Power Draw, $P_{feature}$				W
Time cooler is active, $t_{feature}$				s



ENERGY STAR® Water Coolers Test Reporting Template - Calculations

Calculations (Section 8) for Section 7.1	24 Hour On Mode with No Water Draw	
Recorded No Draw Energy Consumption, Q_{nodraw}		Wh
Recorded No Draw test period, T_{nodraw}		min
Normalized No Water Draw Energy Consumption, Q_{24hr} (Eq 1)	#DIV/0!	Wh

Calculations (Section 8) for Section 7.2, Cold Draw	20s Draw	40s Draw	60s Draw	90s Draw	120s Draw	
Adjusted Replenish Energy, $Q_{replenish}$ (Eq 4)						Wh
Adjusted Replenish Energy in BTU	0	0	0	0	0	BTU
Average Supply Water Temperature, T_{s-avg} (Eq 3)						°F
Average Dispensed Water Temperature, T_{d-avg} (Eq 3)						°F
Mass of Dispensed Water						lbm
Delivered Water Energy, Q_{draw} (Eq 5)	0	0	0	0	0	BTU
On Mode Performance, OMP (Eq 6)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Averaged On Mode Performance, OMP	#DIV/0!					

Calculations (Section 8) for Section 7.2, Hot Draw	20s Draw	40s Draw	60s Draw	90s Draw	120s Draw	
Adjusted Replenish Energy, $Q_{replenish}$ (Eq 4)						Wh
Adjusted Replenish Energy in BTU	0	0	0	0	0	BTU
Average Supply Water Temperature, T_{s-avg} (Eq 3)						°F
Average Dispensed Water Temperature, T_{d-avg} (Eq 3)						°F
Mass of Dispensed Water						lbm
Delivered Water Energy, Q_{draw} (Eq 5)	0	0	0	0	0	BTU
On Mode Performance, OMP (Eq 6)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Averaged On Mode Performance, OMP	#DIV/0!					

Calculations (Section 8) for Section 7.3	Draw 1	Draw 2	Draw 3	
Adjusted Replenish Energy, $Q_{replenish}$ (Eq 4)				Wh
Adjusted Replenish Energy in BTU	0	0	0	BTU
Average Supply Water Temperature, T_{s-avg} (Eq 3)				°F
Average Dispensed Water Temperature, T_{d-avg} (Eq 3)				°F
Mass of Dispensed Water				lbm
Delivered Water Energy, Q_{draw} (Eq 5)	0	0	0	BTU
On Mode Performance, OMP (Eq 6)	#DIV/0!	#DIV/0!	#DIV/0!	
Total Averaged On Mode Performance, OMP	#DIV/0!			



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Next Steps



Follow the development process on the [product development webpage](#)



Questions

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Stakeholders are encouraged to provide written comments for consideration to watercoolers@energystar.com by Dec. 19, 2019.