



# ENERGY STAR<sup>®</sup> Product Specification for Residential Water Heaters

## Eligibility Criteria Draft 1 Version 3.0

1 Following is the **Draft 1** Version 3.0 product specification for ENERGY STAR qualified water heaters. A  
2 product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

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4 **1) Definitions:** Below are the definitions of the relevant terms in this document.

5 A. **Residential Water Heater:** A product that utilizes gas, electricity, or solar thermal energy to heat  
6 potable water for use outside the heater upon demand, including:

7 a. Storage type units<sup>1</sup> designed to heat and store water at a thermostatically controlled  
8 temperature of less than 180 °F, including: gas storage water heaters with a nominal input of  
9 75,000 British thermal units (Btu) per hour or less and having a rated storage capacity of not  
10 less than 20 gallons nor more than 100 gallons; electric heat pump type units with a  
11 maximum current rating of 24 amperes at an input voltage 250 volts or less, and, if the tank is  
12 supplied, having a manufacturer's rated storage capacity of 120 gallons or less.

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14 b. Instantaneous (or "tankless") type units<sup>1,2</sup> which initiate heating based on sensing water flow  
15 and deliver water at a controlled temperature of less than 180 °F, heat water, but contain no  
16 more than one gallon of water per 4,000 Btu per hour of input with an input capacity greater  
17 than 50,000 Btu/h but less than 200,000 Btu per hour.

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19 c. Solar water heaters include a collector and storage tank, and use the sun's thermal energy to  
20 heat water using one of the four basic types of solar water heating systems:

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22 i. forced circulation (includes both direct and indirect systems),  
23 ii. integrated collector and storage,  
24 iii. thermosiphon, or  
25 iv. self-pumped.

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27 d. Add-on Heat Pump Units<sup>1</sup> are air to water heat pumps designed for use with a storage-type  
28 water heater or a storage tank that is not specified or supplied by the manufacturer.

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30 e. Light Duty EPACT covered gas water heaters heat and store water at a thermostatically  
31 controlled temperature, with an input rate >75,000 Btu per hour and ≤100,000 Btu per hour,  
32 and storage volume between 20 and 100 gallons.

33 B. **Energy Factor**<sup>3</sup>: Energy Factor (EF), a measure of water heater overall efficiency, is the ratio of  
34 useful energy output from the water heater to the total amount of energy delivered to the water  
35 heater.

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37 C. **Solar Energy Factor:** Solar Energy Factor (SEF) refers to the energy delivered by the total system  
38 divided by the electrical or gas energy put into the system.

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<sup>1</sup> 10 CFR 430, Subpart B, Appendix E

<sup>2</sup> 10 CFR 430, Subpart A, § 430.2 Definitions

<sup>3</sup> Based on definition in 10 CFR 430, Subpart B, Appendix E

- 40 D. Thermal Efficiency<sup>4</sup>: Thermal efficiency (TE) is the ratio of the heat transferred to the water  
41 flowing through the water heater to the amount of energy consumed by the water heater.  
42
- 43 E. Standby Loss<sup>4</sup>: Standby Loss (SL) means the average hourly energy required to maintain the  
44 stored water temperature.  
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- 46 F. First-Hour Rating<sup>1</sup>: The First-Hour Rating (“FHR”) is an estimate of the maximum volume of hot  
47 water in gallons that a storage water heater can supply within an hour that begins with the water  
48 heater fully heated.  
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- 50 G. Gallons per Minute<sup>1</sup>: Gallons per Minute (“GPM”) is the amount of gallons per minute of hot water  
51 that can be supplied by an instantaneous water heater while maintaining a nominal temperature  
52 rise of 77°F during steady state operation.  
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- 54 H. Manufacturer Limited Warranty: Manufacturer limited warranty is an assurance by the  
55 manufacturer to the consumer that the water heater, including purchased system equipment and  
56 components, are guaranteed to work for a defined period of time.  
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- 58 I. Basic Model: All units of a given type of covered product (or class thereof) manufactured by one  
59 manufacturer and which have the same primary energy source and, which have essentially  
60 identical electrical, physical, or functional (or hydraulic) characteristics that affect energy  
61 consumption, energy efficiency, water consumption or water efficiency<sup>1</sup>. Further, all individual  
62 models within a basic model have the same certified rating based on the applicable sampling  
63 criteria per DOE’s regulations in Part 429<sup>5</sup>, and this rating must be used for all manufacturer  
64 literature, the qualified product list and certification of compliance to DOE standards.  
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- 66 J. Lower Compressor Cut-off Temperature: The temperature below which a heat pump water  
67 heater’s compressor will no longer operate, such that the unit will only work as a conventional  
68 electric resistance water heater.
- 69 K. Combination Space-Heating and Water Heating Appliance: Appliance that provides both space  
70 conditioning (boiler) and hot water heating with one appliance or energy source. The combination  
71 appliance circulates hot water from the water heater through a heat exchanger in the air handler.  
72 A blower will move the heated air through a standard duct system. In the summer, an air  
73 conditioner is connected to the exchanger and the system functions similarly, with cool air being  
74 pushed through the ductwork.  
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76 **Note:** The ongoing Department of Energy (DOE) federal test method rulemaking that impacts all  
77 residential and certain commercial water heaters with residential applications, proposes to establish a  
78 uniform descriptor that will be used to establish ratings for these water heaters and replace the current  
79 metrics: Energy Factor (EF), Thermal Efficiency (TE), and Standby Loss (SL). EPA expects this change in  
80 metrics to warrant a change in the above definitions accordingly. If so, EPA will release a Version 3.1, to  
81 update the metric definitions when the federal test method is finalized.

82 Under the NOPR, DOE proposed a test method for gas water heaters with a rated storage volume  
83 between 2 and less than 20 gallons. If the test method expansion is finalized, EPA is interested in  
84 expanding the range of ENERGY STAR certified instantaneous water heaters to include those with tanks  
85 between 2 and less than 20 gallons. Therefore, EPA proposes to revise the definition of instantaneous  
86 type water heaters to remove the storage capacity limit of 2 gallons for gas instantaneous units.

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<sup>4</sup> 10 CFR 431, Subpart G

<sup>5</sup> 10 CFR 429, Subpart B

87 **Note (cont.):** EPA is aware that the new federal test method will cover a group of commercial units with  
 88 some similarity to the Light Duty EPACT units defined here (Section 1.A.e.). EPA proposes to retain this  
 89 definition for now, to be reexamined when the federal test method is finalized, to see if an expansion of  
 90 scope makes sense.

91 Stakeholders are encouraged to provide comments on the above change and also to provide any  
 92 suggestions on whether there are additional terms that should be defined to clarify this specification.

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 94 **2) Scope:**

95 A. Included Products: Only products that meet the definition of a Residential Water Heater, as  
 96 specified herein, are eligible for ENERGY STAR qualification with exception of those products  
 97 listed in Section 2B.

98 B. Excluded Products: Electric resistance water heaters, Add-on Heat Pump units, and products  
 99 intended only for commercial use are not eligible for this ENERGY STAR Residential Water  
 100 Heater Specification. Combination space-heating and water heating appliances, as defined in  
 101 Section 1, above, are not eligible under this ENERGY STAR Water Heaters specification.  
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103 **3) Qualification Criteria:**  
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105 **Note:** The amended federal standards, effective April 16, 2015, are in some cases equal to or more  
 106 stringent than the current ENERGY STAR requirements for residential water heaters, necessitating a  
 107 revision to the ENERGY STAR criteria. In an effort to continue to distinguish the most energy efficient  
 108 products that provide significant energy and cost savings to the consumer while providing excellent  
 109 performance, EPA proposes to revise the ENERGY STAR criteria for residential water heaters as  
 110 described below. The recommended changes are mainly focused on the current efficiency criteria. The  
 111 rest of the ENERGY STAR criteria are retained, as changes are not warranted at this time.

112 For gas and electric water heaters, the current federal standards include single requirement for each of  
 113 these product categories with a capacity of 20 to 100 gallons. However, under the 2015 amended federal  
 114 standards, these product categories will be broken out into two capacity bins:  $\geq 20$  gal and  $\leq 55$  gal and  
 115  $> 55$  gal and  $\leq 100$  gal. EPA proposes to follow the same breakdown of capacity bins for gas and electric  
 116 water heaters.

117 Stakeholders are encouraged to submit feedback and/or supportive data on the requirements proposed  
 118 below.

119 A. Product Performance Requirements for Electric Water Heaters:  
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**Table 1: Criteria for Qualified Electric Water Heaters**

Criteria		ENERGY STAR Requirements
Energy Factor	$\leq 55$ gallons	EF $\geq 2.0$
	$> 55$ gallons	EF $\geq 2.2$
First Hour Rating		FHR $\geq 50$ gallons per hour
Warranty		Warranty $\geq 6$ years on sealed system
Safety		UL 174 and UL1995
Compressor Cut-Off Temperature (Reporting Requirement Only)		Report ambient temperature below which the compressor cuts off and electric resistance only operation begins

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**Note:** For less than or equal to 55 gallon electric water heaters, the 2015 DOE levels are close to but not equal to the current ENERGY STAR level. However, for greater than 55 gallon units, the 2015 DOE levels are higher than the current ENERGY STAR level, driving the need to revise the ENERGY STAR requirement for this product class. Based on the energy and consumer cost savings analysis, EPA proposes to raise the EF for greater than 55 gallon units from 2.0 to 2.2 EF. Most of the units currently available in the market would meet the proposed requirement. However, with the federal standards raising the baseline efficiency level to nearly 2.0 EF, EPA anticipates an increase in the number of units offered at 2.0 EF or higher thus creating product differentiation in the market and also leading to reduction in the price premium of energy efficient products.

For less than or equal to 55 gallon units, no changes are proposed as there are still energy savings available at this level in comparison to the upcoming federal standards. Also, the 2012 ENERGY STAR market penetration for heat pump water heaters is low enough to suggest the current level continues to highlight the most efficient products for consumers.

B. Product Performance Requirements for Gas Water Heaters:

a. Gas Storage Units

**Table 2: Criteria for Qualified Gas Storage Water Heaters**

Criteria		ENERGY STAR Requirements
Energy Factor	≤ 55 gallons	EF ≥ 0.67
	> 55 gallons	EF ≥ 0.80
First Hour Rating		FHR ≥ 67 gallons per hour
Warranty		Warranty ≥ 6 years on system
Safety		ANSI Z21.10.1/CSA 4.1

**Note:** Similarly, for less than or equal to 55 gallon gas water heaters, the 2015 DOE levels are close to but not equal to the current ENERGY STAR level. However, for greater than 55 gallon units, the 2015 DOE level is at condensing level which is higher than the ENERGY STAR requirement.

EPA proposes to raise the EF for greater than 55 gallon units from 0.67 to 0.80 EF. Currently there are no gas water heaters greater than 55 gallon available in the market that would meet the proposed requirement. However, EPA anticipates that as manufacturers prepare products for the market that meet the forthcoming federal standard, market availability for products that meet the proposed level will grow. An ENERGY STAR level of 0.80 EF will provide sufficient product differentiation between the standard and efficient products.

For less than or equal to 55 gallon units, EPA proposes to retain the current ENERGY STAR level of 0.67 EF. According to the AHRI certified products directory, about 30% of the less than or equal to 55 gallon models meet the 0.67 EF level – confirming that the current level continues to highlight the most efficient products for consumers.

157 b. Gas Instantaneous Units  
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**Table 3: Criteria for Qualified Gas Instantaneous Water Heaters**

Criteria	ENERGY STAR Requirements
Energy Factor	EF ≥ 0.90
Gallons-Per-Minute	GPM ≥ 2.5 over a 77° rise
Warranty	Warranty ≥ 10 years on heat exchanger and 5 years on parts
Safety	ANSI Z21.10.3/CSA 4.3

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161 **Note:** The 2015 federal standard for gas instantaneous water heaters is very close to the current  
 162 ENERGY STAR requirement, necessitating a revision. Research and analysis indicate that a requirement  
 163 of 0.90 EF for instantaneous water heaters (recognizing products with condensing technology) will enable  
 164 consumers to re-coup up-front costs quickly and provide strong product differentiation between standard  
 165 and high energy efficiency products in the market. In addition, considerable product availability provides a  
 166 wide range of consumer choice. Taking these considerations into account, EPA proposes to raise the EF  
 167 from 0.82 to the condensing level of 0.90. EPA considered raising the requirement even further, but the  
 168 0.90 EF level also preserves the opportunity for a technology neutral approach in future specification  
 169 revisions, with gas storage and gas instantaneous criteria combined into a single set of gas water heater  
 170 criteria.

171 c. Light Duty EPACT Covered Gas Water Heaters  
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**Table 4: Criteria for Qualified Light Duty EPACT Covered Gas Water Heaters**

Criteria	ENERGY STAR Requirements
Thermal Efficiency	TE ≥ 0.90
Standby Loss	Standby loss ≤ 1647 btu/hr × (TE – 0.75)
Warranty	Warranty ≥ 6 years on system
Safety	ANSI Z21.10.3/CSA 4.3

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176 **Note:** In the ongoing test method rulemaking, DOE is proposing to include certain commercial water  
 177 heaters with residential applications under the residential test method. DOE's proposal defines these  
 178 commercial water heaters as any gas-fired, electric, oil storage, or instantaneous commercial water  
 179 heater that meets the following conditions:

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**Note (cont.):**  
- For models requiring electricity, uses single-phase external power supply  
- Is not capable of delivering hot water at temperatures of 180°F or above; and  
- Does not bear a Code Symbol Stamp signifying compliance with the requirements of the ASME Boiler and Pressure Vessel Code.  
EPA intends to keep the current scope of Light Duty EPACT covered water heaters as-is, which are a subset of the DOE proposed scope. Once the federal test method is final, EPA will consider expanding the scope of this category. Based on analysis of products now in scope, EPA proposes to retain the Thermal Efficiency requirement but slightly tighten the standby loss requirement to reflect similar annual energy use, in residential applications, to that of gas storage water heaters >55 gallons meeting the proposed EF requirement. These large storage heaters are the products in most direct competition with products in the Light Duty EPACT Covered category.

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C. Product Performance Requirements for Solar Water Heaters:

**Table 5: Criteria for Qualified Solar Water Heaters**

Criteria	ENERGY STAR Requirements
Solar Energy Factor	SEF ≥ 1.8 for electric backup SEF ≥ 1.2 for gas backup
Warranty	Warranty ≥10 years on collector, 6 years sealed system, 2 years on controls, 1 year on parts

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D. Significant Digits and Rounding:

- a. All calculations shall be carried out with directly measured (unrounded) values, except EF shall be rounded to the nearest 0.01, as specified in 10 CFR 430.23(e)(2).
- b. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit. TE shall be rounded to the nearest 0.01 and SL shall be rounded to the nearest whole number. SEF shall be rounded to the nearest 0.1.

206 **4) Connected Product Criteria:**

207 The following are optional connected criteria for ENERGY STAR electric hot water heaters to be  
208 recognized as having 'connected functionality.'

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**Note:** In this Draft 1 Version 3.0 specification, EPA is proposing optional connected criteria that will enable electric water heaters that include connected functionality to be recognized as such on the ENERGY STAR website.

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In speaking with water heater manufacturers, EPA has learned that a number of current products include connected functionality that enables enhanced consumer control and convenience and the ability to enable grid benefits through connection and responsiveness to demand response and other grid signals.

215 **Note (cont.):** While manufacturers cautioned that for a number of reasons, high-efficiency electric heat-  
216 pump water heaters are not suitable for certain smart grid opportunities, such as Electrical Thermal  
217 Storage (ETS), EPA does believe that high-efficiency water heaters can offer both tangible grid benefits  
218 and direct consumer benefits associated with connected functionality.

219 While including certain core elements of optional connected criteria from other ENERGY STAR product  
220 categories; the EPA proposal for water heaters is comparatively a simpler and higher-level approach.  
221 EPA does not anticipate that specific testing, for example to validate DR functionality, will be required.

222 EPA is aware of the collaborative efforts of AHRI and CEE to develop uniform signals and communication  
223 requirements for connected water heaters (among other products). EPA looks forward to a collaborative  
224 process that will result in protocols that recognize water heaters that deliver consumer, environmental,  
225 and grid benefits.

226 In meantime, EPA proposes connected criteria now so that products currently on the market that provide  
227 consumer and grid benefits already can be recognized promptly.

## 228 A. Definitions

229 The following definitions are applicable to Section 4 of this specification:

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- 231 a. Communication Link: The mechanism for bi-directional data transfers between the water  
232 heater and one or more external applications, devices or systems.
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- 234 b. Consumer Authorized Third Party: Any entity for which the consumer has provided explicit  
235 permission to access the water heater connected functionality, in whole or in part, via a  
236 communication link.
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- 238 c. Open Standards: Standards that are:
- 239 i. Included in the Smart Grid Interoperability Panel (SGIP) Catalog of Standards,<sup>6</sup> and/or  
240 ii. Included in the National Institute of Standards and Technology (NIST) Smart Grid  
241 framework Tables 4-1 and 4-2,<sup>7</sup> and/or  
242 iii. Adopted by the American National Standards Institute (ANSI) or another well-established  
243 international standards organization such as the International Organization for  
244 Standardization (ISO), International Electrotechnical Commission (IEC), International  
245 Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE),  
246 or Internet Engineering Task Force (IETF).
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- 248 d. Premises: Land and the improvements on it.

249 **Note:** Specific terms used in Section 4 are defined above. The open standards definition is consistent  
250 with the ENERGY STAR Refrigerators and Freezers final Version 5.0 specification and in recognition of  
251 the variety of approaches currently being evaluated or deployed, is intended to allow manufacturers  
252 significant latitude in product communications.

## 253 B. Communications

- 254 a. The water heater shall provide a communication link on the consumer's premises for  
255 functionality detailed in Sections 4C through 4E. The communication link shall use open  
256 standards for all communication layers.
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<sup>6</sup> [http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PMO#Catalog\\_of\\_Standards\\_Processes](http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PMO#Catalog_of_Standards_Processes)

<sup>7</sup> [http://www.nist.gov/smartgrid/upload/NIST\\_Framework\\_Release\\_2-0\\_corr.pdf](http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf)

258 b. An Interface Control Document (ICD), Application Programming Interface (API), or other  
259 documentation shall be made available to interested parties that enables consumer-  
260 authorized third parties access to the functionality defined in paragraphs 4C through 4E over  
261 the communication link.

262 **Note:** Consistent with other ENERGY STAR products that include connected criteria, in this Draft 1  
263 Version 3.0 specification, EPA has proposed that water heaters use open-standards for all  
264 communication layers and that an API, ICD, or similar be available to interested third parties. By  
265 mandating both open standards and an API/ICD, EPA intends to ensure that consumers and third parties  
266 have access to all section 4 functionality, whether implemented through standardized message structures  
267 or through manufacturer specific protocols, as permitted by many open standards.

268 For water heaters, EPA proposes that the product must provide open standards-based interconnection  
269 within the home based on our understanding of the AHRI White Paper entitled, “*Smart*” Systems. The  
270 paper points out that water heaters have been participating in load control programs for years, in which  
271 homeowners grant utilities direct control of the product without intermediation by a third party or even an  
272 in-home network. EPA also intends for this requirement to be compatible with the direction of the  
273 CEE/AHRI effort to define protocols for grid interactive water heaters. EPA is interested in stakeholder  
274 feedback on this approach.

275 EPA proposes that water heaters use only open protocols for all connected functionality, including remote  
276 management. EPA continues to believe that this provides the broadest opportunity for consumer and grid  
277 benefit. EPA requests stakeholder feedback on the suitability of this approach for electric storage water  
278 heaters.

### 279 C. Remote Management

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281 At a minimum, the water heater shall be capable of responding to control signals, from  
282 consumers and/or consumer authorized third parties, requesting operational changes reflective of  
283 what is consumer controllable on the product itself, including:

- 284 a. Operational mode (e.g. heat-pump only, hybrid, high demand, electric-only, vacation)
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- 286 b. Water temperature setting
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- 288 c. On-Off (if consumer controllable on the product)

289 **Note:** In this Draft 1 Version 3.0 specification, EPA has proposed remote management criteria such that  
290 the product is capable being remotely controllable to the extent it is directly controllable. In general, this  
291 includes operating mode control, adjustment of water temperature and On-Off control, if such control is  
292 available on the product itself.

### 293 D. Operational Status

294 At a minimum, the water heater shall be capable of providing the following information to  
295 consumers and consumer-authorized third parties via a communication link:

- 296 a. Operational status (e.g. heat-pump active/standby, electric heating active/standby)
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- 298 b. Operational mode (e.g. heat-pump only, hybrid, high demand, electric-only, vacation)
- 299
- 300 c. Water temperature setting (°F / °C)
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**Note:** In this Draft 1 Version 3.0 specification, proposed operational status reporting criteria is intended to enable direct consumer benefits, inform energy management systems and applications, and help inform utilities as to the magnitude of available, dispatch-able load.

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**E. Demand Response**

- a. At a minimum, electric hot water heaters shall be capable of shedding load in response to signals from consumer-authorized third parties that request near-term or scheduled load reductions.
- b. Consumer override: The consumer shall be able to override the product's Demand Response participation without limitation.

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**Note:** EPA recognizes that while electric resistance water heater programs are well established, utilities and water heater manufacturers are still exploring the appropriate type and level of control that will enable grid benefits from high-efficiency heat-pump water heaters while minimizing impacts to consumers. Manufacturers have informed EPA that heat-pump water heater compressors should not be cycled frequently and that fast-response load shedding in these products may be limited to shutting-down or deactivating electric-resistance heating elements.

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Accordingly, in this Draft 1 Version 3.0 specification, proposed demand response criteria is specified at a high level that is intended to allow manufacturers the flexibility to work with utilities to determine the appropriate type and level of demand responsiveness, while ensuring consumers are always able to override their product's DR status. EPA expects manufacturers will enable a level of utility control that provides tangible grid benefits while minimizing the risk of undue product stress or consumer impact. Stakeholder comments are encouraged on this approach.

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**F. Information to Installers and Consumers**

If additional modules, devices, services, or supporting infrastructure are required in order to activate the water heater's communications capabilities, installation instructions and a list of these requirements shall be made available at the point of purchase and prominently displayed in the product literature. It is also suggested that information be provided on the product packaging and on the product. These instructions shall provide specific information on what must be done to activate these capabilities (e.g., a product package or product label might briefly state "*This product has an open standards-based modular communications interface and is shipped with a pre-installed Wi-Fi module. Internet connectivity and a wireless router are required to enable interconnection with external devices, systems or applications.*")

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**5) Test Requirements:**

A. A representative model shall be selected for testing per the following requirements:

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- a. For qualification of an individual product model, the representative mode shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR;
  - b. For qualification of a basic model, any model within that basic model may be considered the representative model.
- B. One of the following sampling plans shall be used for purposes of testing for ENERGY STAR qualification:
- a. A single unit is selected, obtained, and tested. The measured performance of this unit and of each subsequent unit manufactured must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to qualify additional

- 351 individual model variations within a basic model as long as the definition for basic model  
 352 provided in Section 1, above, is met, or  
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 354 b. Units are selected for testing and results calculated according to the sampling requirements  
 355 defined in 10 CFR Part 429, Subpart B § 429.17. The certified rating must be equal to or  
 356 better than the ENERGY STAR specification requirements. Results of the tested unit may be  
 357 used to qualify additional model variations within a basic model as long as the definition for  
 358 basic model provided in Section 1, above, is met.  
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 360 C. When testing residential water heaters, the following test methods shall be used to determine  
 361 ENERGY STAR qualification:  
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**Table 6: Test Methods for ENERGY STAR Qualification**

ENERGY STAR Requirement	Test Method Reference	Applicable Products
Energy Factor	10 CFR 430, Subpart B, Appendix E*	Gas and electric units; FHR only for storage units, GPM only for instantaneous.
First Hour Rating (FHR)		
Gallons per minute (GPM)		
Thermal Efficiency	10 CFR 431, Subpart G	Light duty EPACT covered gas water heaters
Standby Loss		
Solar Energy Factor	SRCC – OG-300: Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems	Whole-home solar units

364 \* Includes any applicable guidance that DOE has issued regarding the testing of these products  
 365 (See <http://www1.eere.energy.gov/guidance/default.aspx?pid=2&spid=1>). **Note on recovery**  
 366 **efficiency:** Guidance includes that for thermostatically-controlled water heaters that do not  
 367 initiate and complete a recovery cycle prior to the start of the second draw of the simulated-use  
 368 test, the recovery efficiency shall be determined as specified in Section 11.2 of ASHRAE 118.2.

- 369 D. Compliance with Connected functionality, as specified in Section 4, shall be through examination  
 370 of product and/or product documentation.

371 **Note:** EPA will release an update to this specification, Version 3.1, to adopt the new federal test method  
 372 once it is finalized.

373 Coincident with the inclusion of optional connected functionality in this Draft 1 Version 3.0 specification,  
 374 5D clarifies that verification may be through examination of the product and/or the product documentation.

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 376 **6) Effective Date:**  
 377 The ENERGY STAR Residential Water Heater specification shall take effect on **TBD**. To qualify for  
 378 ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the  
 379 model's date of manufacture. The date of manufacture is specific to each unit and is the date on  
 380 which a unit is considered to be completely assembled.

381 **Note:** EPA expects to finalize the Version 3.0 Water Heater specification in the summer of 2014, with the  
 382 intention of aligning the effective date with the federal standards effective date of April 16, 2015.

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 384 **7) Future Criteria Revisions:**  
 385 EPA reserves the right to change the specification should technological and/or market changes affect  
 386 its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to

387 the specification are arrived at through industry discussions. In the event of a specification revision,  
388 please note that the ENERGY STAR qualification is not automatically granted for the life of a product  
389 model.