



# ENERGY STAR® Program Requirements for Commercial Ovens

## Draft 2: Partner Commitments

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### Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified commercial ovens. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on commercial ovens and specifying the testing criteria for commercial ovens. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request;
- comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR marks and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;
- qualify at least one ENERGY STAR commercial oven within one year of activating the commercial ovens' portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time;
- Provide clear and consistent labeling of ENERGY STAR qualified commercial ovens. The ENERGY STAR mark must be clearly displayed on the front of the product, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed;
- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying commercial oven models. Once the Partner submits its first list of ENERGY STAR qualified commercial ovens, the Partner will be listed as an ENERGY STAR Partner. Partner must provide annual updates in order to remain on the list of participating product manufacturers;
- provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified commercial ovens shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., capacity, size, speed, or other as relevant), total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner;
- notify EPA of a change in the designated responsible party or contacts for commercial ovens within 30 days.

## Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep EPA informed on the progress of these efforts:

- consider energy efficiency improvements in company facilities and pursue the ENERGY STAR mark for buildings;
- purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes;
- ensure the power management feature is enabled on all ENERGY STAR qualified monitors in use in company facilities, particularly upon installation and after service is performed;
- provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified product models;
- feature the ENERGY STAR mark(s) on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on the ENERGY STAR Web site at [www.energystar.gov](http://www.energystar.gov)), EPA may provide links where appropriate to the Partner Web site;
- provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR labeled products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event;
- provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. SmartWay Transport works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit [www.epa.gov/smartway](http://www.epa.gov/smartway).
- join EPA's Climate Leaders Partnership to inventory and reduce greenhouse gas emissions. Through participation companies create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders. For more information on Climate Leaders, visit [www.epa.gov/climateleaders](http://www.epa.gov/climateleaders).
- join EPA's Green Power partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities, visit <http://www.epa.gov/grnpower>.



# ENERGY STAR® Program Requirements for Commercial Ovens

## Draft 2: Eligibility Criteria

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Below is the **DRAFT 2** Version 1.0 product specification for ENERGY STAR qualified commercial ovens. A product must meet all of the identified criteria if it is to earn the ENERGY STAR.

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

- A. **Commercial Oven:** A chamber designed for heating, roasting, or baking food by conduction, convection, radiation, and/or electromagnetic energy<sup>1</sup>.

**Note:** EPA developed the definitions for Oven Types, below, based on the relevant ASTM test standard definitions. However, for EPA's purposes, the ASTM definitions as written are too broad. The purpose of this section is to define which product types are covered by the specification or excluded from qualification. As such, it is important that EPA use concise terms and definitions to avoid any confusion regarding product qualification. Therefore, EPA will continue to use the definitions below for the basis of this ENERGY STAR specification.

#### Oven Types

- B. **Combination Oven:** An oven that combines the function of hot air convection (oven mode) and saturated/superheated steam heating (steam mode), or both (combi mode), to perform steaming, baking, roasting, rethermalizing, and proofing of various food products. Also referred to as a combination oven/steamer, combi or combo.
- C. **Convection Oven:** A general-purpose oven that cooks food by forcing hot dry air over the surface of the food product. The rapidly moving hot air strips away the layer of cooler air next to the food and enables the food to absorb the heat energy. For the purposes of this specification, convection ovens do not include the ovens that have the ability to heat the cooking cavity with saturated or superheated steam.

**Note:** EPA received questions from stakeholders regarding ovens that provide moist heat. To reduce the potential for confusion between convection ovens with moist heat capability and combination ovens, as defined in 1B above, this Version 1.0 specification considers moist heat ovens as combination ovens. Stakeholders are encouraged to provide feedback on this clarification.

- **Full-Size Convection Oven:** A convection oven that is able to accept a minimum of five standard full-size sheet pans measuring 18 x 26 x 1-inch.
- **Half-Size Convection Oven:** A convection oven that is able to accept a minimum of five sheet pans measuring 18 x 13 x 1-inch.

**Note:** EPA received several questions from stakeholders regarding the proposed approach for categorizing convection ovens (i.e., full versus half-size). EPA based this proposal on the industry-standard nomenclature referring to the standard sheet pan size that the oven can accommodate. During the February stakeholder meeting it was suggested that EPA include a minimum of 5 pans for both half-size and full-size convection ovens to further differentiate these traditional units from smaller countertop designs. Stakeholders are encouraged to provide feedback on this addition.

<sup>1</sup> NSF 170-2005, *Glossary of food equipment terminology*.

- 169 D. Conventional or Standard Oven: An oven that cooks food primarily using the naturally occurring  
170 hot air currents to transfer heat over the surface of the food product without the use of a fan or  
171 blower. The burner or elements heat the air within the oven cavity as well as the cavity walls,  
172 causing currents of hot air that transfer heat to the surface of the food. The hot air's buoyancy  
173 carries it upward through cooler air, which then slowly sinks to the bottom of the oven as it cools  
174 off.  
175
- 176 E. Conveyor Oven: An oven designed to carry food product on a moving belt into and through a  
177 heated chamber.  
178
- 179 F. Cook-and-Hold Oven: An oven designed specifically for low-temperature (e.g., less than 300°F)  
180 cooking, followed by a holding period at a specified temperature.  
181
- 182 G. Deck Oven. An oven that cooks food product directly on the floor of a heated chamber. The  
183 bottom of each compartment is called a deck and heat is typically supplied by burners or elements  
184 located beneath the deck. The oven ceiling, floor, and walls are designed to absorb heat quickly  
185 and radiate that heat back slowly and evenly.  
186
- 187 H. Mini-Rack Oven: A rack oven that has the ability to produce steam internally and includes an  
188 internal rotating rack where pans are manually pushed into the racks. Mini-rack ovens typically  
189 hold 5 – 8 full-size sheet pans.  
190
- 191 I. Rack (Roll-In) Oven: A high-capacity oven, with the ability to produce steam internally and fitted  
192 with a motor-driven mechanism for rotating multiple pans fitted into one or more pan racks within  
193 the cavity.  
194
- 195 • Single Rack Oven: A rack oven that is able to hold one full rack of sheet pans of product at a  
196 time, based on nominal 4-inch spacing between pans.  
197
  - 198 • Double Rack Oven: A rack oven that is able to hold two single racks or one double-width  
199 rack, based on nominal 4-inch spacing between pans.  
200

**Note:** EPA has included a new definition for mini-rack ovens. However, these products are excluded from qualification under this version of the specification. A clarification has been added requiring that rack (roll-in) ovens must have the ability to produce steam, which impacts the energy consumption of the unit. Further differentiation is also provided regarding single and double rack oven size. EPA is interested in stakeholder feedback on the definitions for single-rack, double-rack, and mini-rack ovens to ensure a clear distinction between these product types.

- 208
- 209 J. Range Oven: An oven base for a commercial range top (i.e., burners, electric elements or hobs).  
210 Range ovens may use either standard or convection technologies to cook food.  
211
- 212 K. Rapid Cook Oven: An oven that utilizes one or more non-traditional heat transfer technologies to  
213 cook food product significantly faster than would be possible using conventional (e.g., convection,  
214 conduction, radiant) heat transfer technologies. Heat transfer technologies that may be employed  
215 include microwave, quartz halogen and high-velocity or impingement convection.  
216
- 217 L. Rotisserie Oven: An oven fitted with a mechanism to move or turn food past a fixed heat source  
218 while the food is slowly being cooked on all sides.  
219

## 220 Energy Efficiency Measures

- 221
- 222 M. Cooking Energy Efficiency: The ratio of energy absorbed by the food product to the total energy  
223 supplied to the oven during cooking.  
224
- 225 N. Idle Rate: The rate of oven energy consumption while it is maintaining or holding at a stabilized  
226 operating condition or temperature. Also called standby energy rate.  
227

**2) Qualifying Products:** Only commercial *convection* ovens and *rack* ovens, as defined in Section 1C and 1I above, are eligible for ENERGY STAR qualification under this Version 1.0 specification. EPA may consider covering additional commercial oven types, as defined in Section 1, in future versions of this specification.

Ovens qualifying under this specification must be third-party certified to NSF/ANSI Standard 4, *Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment*.

**Note:** This specification is intended for commercial food-grade ovens. Ovens designed for residential or laboratory applications cannot qualify for ENERGY STAR.

**Note:** Due to the absence of an ASTM test procedure and performance data, mini-rack ovens are excluded from this Version 1.0 specification. While mini-rack ovens have a limited manufacturing pool they are growing in market share. However, the existing ASTM rack oven test standard does not address mini-rack ovens. Mini-rack ovens are similar to convection ovens but are used more for baking and offer significant differences in the amount of steam delivered and timing. Once the ASTM Committee determines which test method best applies to mini-rack ovens, manufacturers are encouraged to test and share efficiency performance data with EPA for consideration in future versions of this specification.

There is also interest in including countertop convection ovens under this Version 1.0 specification. To date, EPA has limited data on countertop models but also recognizes that separate requirements may need to be developed due to differing production capacities and applications. Currently, the ASTM test method specifies testing convection ovens with 5 pans of product for the heavy-load potato test. This approach excludes the testing of countertop units since they are designed with less than 5 pans. EPA is currently considering allowing manufacturers to test ovens with smaller pan capacities by using the maximum number of pans that the oven could accommodate, up to five pans. The oven would need to be able to hold either 9 x 13-inch pans (half-size) or 18 x 26-inch pans (full-size), to be applicable. Manufacturers of countertop units are encouraged to test their units using this testing approach for EPA consideration. If levels cannot be determined over the next several weeks, countertop units will continue to be excluded from this Version 1.0 and considered under subsequent versions of the specification.

**3) Efficiency Requirements for Qualifying Products:** Commercial ovens must meet all the requirements provided below to qualify as ENERGY STAR.

Table 1: Energy Efficiency Requirements for Convection Ovens	
<b>Gas</b>	
<b>Half-Size</b>	
Cooking Energy Efficiency*	≥ 44%
Idle Energy Rate	TBD
<b>Full-Size</b>	
Cooking Energy Efficiency*	≥ 44%
Idle Energy Rate	≤ 13,000 Btu/h
<b>Electric</b>	
<b>Half-Size</b>	
Cooking Energy Efficiency*	≥ 70%
Idle Energy Rate	≤ 1.0 kW
<b>Full-Size</b>	
Cooking Energy Efficiency*	≥ 70%
Idle Energy Rate	≤ 1.6 kW

\*Convection oven cooking energy efficiency is based on the heavy-load (potato) cooking test.

**Table 2: Energy Efficiency Requirements for Rack Ovens**

<b>Gas</b>	
<b>Single Rack</b>	
Baking Energy Efficiency	<b>TBD</b>
Idle Energy Rate	<b>TBD</b>
<b>Double Rack</b>	
Baking Energy Efficiency	$\geq 52\%$
Idle Energy Rate	$\leq 35,000$ Btu/h
<b>Electric</b>	
<b>Single Rack</b>	
Baking Energy Efficiency	<b>TBD</b>
Idle Energy Rate	<b>TBD</b>
<b>Double Rack</b>	
Baking Energy Efficiency	<b>TBD</b>
Idle Energy Rate	<b>TBD</b>

**Note:** There was some concern that EPA's data sets might be skewed toward the top performers. EPA believes that the masked data sets initially provided by PG&E's Food Service Technology Center (FSTC) demonstrate a good representation of the ranges in efficiencies currently available in the marketplace today. The proposed levels are based on approximately the top 25% of EPA's data sets for available convection and rack ovens. However, manufacturers are encouraged to submit additional data points representing **standard efficiency designs** to confirm the performance levels proposed in Tables 1 and 2, above. Several manufacturers have already indicated interest in testing additional ovens. All additional data will be used to support existing or revisions to cooking/baking energy efficiency and idle energy rate proposed levels. As part of the specification development process, stakeholders are encouraged to submit performance data to EPA for consideration.

**Volume vs. Idle Energy Rate:** EPA has analyzed the impact of cavity size on idle energy consumption in response to concerns with the varying volumetric proportions within the larger full-size and half-size convection oven categories and the impact on idle energy rate. While most convection ovens meet standard width and depth specifications, there are instances where more specialized models may be deeper or require larger space between pans to accommodate product. Based on the current data set, EPA plotted idle energy rate against oven cavity volume (ft<sup>3</sup>) to determine if there is an observable relationship. The analysis indicates that larger volume does not necessarily result in higher idle energy rate. Overall, cavity size seems to have a minimal impact on idle energy rate and therefore, EPA is continuing to base idle energy rate on full-size and half-size categorization. To view the scatter plot analysis go to [www.energystar.gov/productdevelopment](http://www.energystar.gov/productdevelopment) and click on New Specifications in Development.

**Oven Categories with Limited Data Sets:** EPA has limited data on the following oven categories: half-size gas convection, single rack gas, and electric rack (single and double). Unless additional power consumption data on these oven categories is received by April 10, EPA will exclude these product types from the specification.

According to industry sources, half-size gas convection ovens represent a very small part of the market (<5%) compared to their electric half-size counterparts (>95%). As such, EPA would feel comfortable setting an efficiency specification for only the electric half-size models, if the current data does not support setting gas efficiency levels.

Similarly, electric rack ovens overall represent only 10% of the market while gas rack ovens represent 90% of the total products sold. However, for the subcategory of single rack gas ovens, the units sold represent a larger portion of the total rack oven market (i.e. roughly 30%). While EPA has a fairly robust data set for double rack gas ovens, there is no energy efficiency data yet available on single rack designs. However, EPA understands that testing is underway on a few single rack gas units.

**Note continued:**

While there is some justification for excluding half-size gas convection ovens and electric rack ovens due to their small market share, moving forward with a gas rack oven specification without including single rack is less likely because of its significant market share. Therefore, if EPA does not move forward with single gas rack ovens then the entire rack oven category will be excluded from this Version 1.0 specification.

Furthermore, based on our guiding principles, EPA may decide to exclude these products if submitted data shows insufficient differentiation regarding energy efficiency performance. If excluded from this Version 1.0, EPA will consider these product types under subsequent versions of the specification (i.e., Section 6, below). Stakeholders with additional data on these product types are encouraged to submit this data to EPA for consideration.

Additional comments and data should be sent to Rebecca Duff, ICF International, at [rduff@icfi.com](mailto:rduff@icfi.com) by **Friday, April 10.**

**4) Test Criteria:** Partners are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. The test results must be reported to EPA using the Commercial Ovens Qualifying Product Information (QPI) Form. When testing commercial ovens, partners agree to use the following test procedures to determine ENERGY STAR compliance:

- ASTM F1496, *Standard Test Method for Performance of Convection Ovens*
- ASTM F2093, *Standard Test Method for Performance of Rack Ovens*

**Note:** In response to concerns regarding the quality and accuracy of self testing and reporting, EPA will require that a laboratory technician or company representative sign all QPI forms submitted for ENERGY STAR qualification.

**Note:** For purposes of ENERGY STAR, cooking energy efficiency is measured at heavy-load conditions per the relevant ASTM test procedure. Manufacturers must disable any set back mode feature while testing ovens for ENERGY STAR qualification.

**Note:** Commercial ovens should be tested at heavy-load conditions per ASTM F1496 and F2093 test methods for purposes of qualifying ovens for ENERGY STAR.

**Set Back Mode:** Based on significant input from stakeholders, in order for the test results to provide a realistic profile of the equipment's power consumption under normal operation (i.e., worst case scenario) EPA is requiring that set back mode features be *disabled* during testing. EPA supports efforts to further reduce energy consumption in situations where it makes sense and will work with ENERGY STAR partners to educate consumers about set back modes and other energy saving features.

**Multiple Oven Control and Door Options:** Ovens that offer multiple control and/or door (e.g. glass, solid) options must meet the requirements presented in Tables 1 and 2, as appropriate, utilizing all of these options for that model to qualify as ENERGY STAR.

**Note:** Many ovens come with multiple control and/or door options, all of which could impact the energy profile of the unit. Typically, the model number stays the same regardless of control or door type. EPA is proposing that all control/door options be required to meet the specification requirements for a model to qualify as ENERGY STAR. This will avoid any confusion as to which options actually meet ENERGY STAR requirements especially in situations where all of these options are provided on the same specification sheet. Another option would be for manufacturers to assign a unique model number to the different control and/or door options so it is clear what combination(s) meets ENERGY STAR requirements. Manufacturers are encouraged to provide feedback on this proposal.



**Ovens with Variable Btu Input:** Manufacturers qualifying ovens with variable Btu input must test and report performance results at all available inputs. The oven must meet the cooking/baking energy efficiency and idle energy rate requirements presented in Tables 1 and 2, as appropriate, at all available Btu inputs to qualify for ENERGY STAR.

**Note:** Oven models that offer variable Btu inputs must be tested and meet ENERGY STAR requirements at all available inputs. This will ensure that the end user gets high efficiency performance regardless of the Btu input used in operation.

**5) Effective Date:** The date that manufacturers may begin to label and promote qualifying products as ENERGY STAR will be defined as the *effective date* of the agreement. The ENERGY STAR Commercial Oven Specification shall go into effect on **May 16, 2009**

**Note:** It continues to be EPA's intent to finalize and launch this new ENERGY STAR Version 1.0 specification at the National Restaurant Association (NRA) Show, May 16 – 19, 2009. EPA has extended the effective date slightly to allow manufacturers time to test additional products and submit data to EPA for consideration as part of the Draft 2 review process.

Two weeks following the Draft 2 comment deadline, EPA will release a Final Draft specification (i.e., April 24). Stakeholders will have two additional weeks to send in any final comments on the Final Draft prior to the specification being finalized and distributed on May 8. EPA anticipates that any changes to the Final Draft will be minimal and limited to clarifications, as opposed to broad sweeping changes to levels or requirements.

In preparation for the NRA Show, manufacturers will be given a QPI form and information about joining the ENERGY STAR program along with the Final Draft specification.

As discussed during the stakeholder meeting, if the comments received on this Draft 2 specification require additional detailed discussions and data analysis, EPA may instead use the NRA Show to meet with manufacturers. If this is the case, EPA will alert stakeholders of this change in timeline shortly following the April 10 deadline.

**6) Future Specification Revisions:** EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that ENERGY STAR qualification is not automatically granted for the life of a product model. To carry the ENERGY STAR mark, a product model must meet the ENERGY STAR specification in effect on the model's date of manufacture.

**Combination and Other Oven Types:** Approximately one year after the effective date of this Version 1.0 specification (i.e., May 16, 2010), EPA will evaluate whether to extend coverage to combination ovens and other oven types defined in Section 1, above. Inclusion of these additional oven types will depend on stakeholder interest, test procedure availability, and access to a sufficient quantity of product performance data.