



ENERGY STAR® Program Requirements for Residential Furnaces

Partner Commitments Version 2.0 – Draft 1

Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified residential furnaces. 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 furnaces and specifying the testing criteria for furnaces. 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 furnace model within one year of activating the furnaces 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 furnaces. The ENERGY STAR mark must be clearly displayed 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. It is also recommended that the label appear on the top/front of the product and on the product packaging;
- offer and encourage training to distributors and/or contractors on the following issues: system venting, condensate removal, code compliance, and proper use of the Manual J calculation, or other equivalent calculation, in order to encourage proper sizing of equipment;
- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying furnace models. Once the Partner submits its first list of ENERGY STAR qualified furnace models, 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 furnaces 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 furnaces 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 labeled 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 label(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), 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 qualified 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.



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Eligibility Criteria Version 2.0 – Draft 1

Below is the **DRAFT 1** Version 2.0 product specification for ENERGY STAR qualified residential furnaces. A product must meet all of the identified criteria to earn the ENERGY STAR.

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

A. **Furnace:** A heating unit with a heat output of less than 100 KW (340,000 Btuh) whose function is the combustion of fossil fuel for space heating with forced hot air. Unit must include burner(s), heat exchanger(s), blower(s) and connections to heating ducts. A heating unit that meets this definition and also provides hot water for domestic or other use may be considered a furnace for purposes of this agreement.

B. **AFUE:** The Annual Fuel Utilization Efficiency ("AFUE") measures the amount of fuel converted to space heat in proportion to the amount of fuel entering the furnace. This is commonly expressed as a percentage. For purposes of this agreement, the efficiency of a furnace shall be measured using AFUE. Test procedures have been developed to test AFUE by the Department of Energy (DOE). These procedures are specified in 10 Code of Federal Regulations (CFR) part 430, Appendix N.

C. **Eae:** The average annual auxiliary electrical energy consumption for a gas furnace in kilowatt-hours per year (kWh/yr). It is the total electrical energy supplied to a furnace during a one-year period¹.

Note: Only residential furnaces can qualify for ENERGY STAR under this specification. To clarify the intent of this specification the word "residential" now appears throughout the document, where appropriate. A heating capacity limit (< 100 KW) was also added to the furnace definition above that reiterates the requirements of ANSI/ASHRAE Standard 103-1993 and DOE 10 CFR Part 430, Appendix N, which is referenced in Section 4, below.

A definition for Eae has been added to this section to support the furnace fan energy efficiency requirements proposed in Section 3, below.

D. **Manufacturer Limited Warranty:** For purposes of this agreement, a manufacturer limited warranty is an assurance by the Partner that purchased system equipment and components are warranted by the manufacturer for a period of time. The period of time is typically expressed in numbers of years.² The exact terms of the limited warranty shall be determined by the Partner.

2) **Qualifying Products:** Any residential furnace that meets the definition in Section 1A is eligible for ENERGY STAR qualification.

3) **Energy-Efficiency Specifications:** Only those products listed in Section 2 that meet the following Tier I and Tier II criteria may qualify as ENERGY STAR. Proposed effective dates for Tiers I and II are covered in Section 5 of this specification.

¹ GAMA, April 26, 2006 Consumers' Directory of Certified Efficiency Ratings for Heating and Water Heating Equipment.

² At the time of writing, a manufacturer limited warranty is typically 20 years for the heat exchanger(s).

Tier I

- A. Gas furnace models: $\geq 90\%$ AFUE rating
- B. Oil furnace models: $\geq 83\%$ AFUE rating

In addition Partner will:

- Include a manufacturer limited warranty with its qualified furnace models.
- Consider using high efficiency electric blower motors with its qualified furnace models.

Tier II

- A. Gas furnace models: $\geq 90\%$ AFUE rating and Eae ≤ 800 kWh/year
- B. Oil furnace models: $\geq 83\%$ AFUE rating and Eae ≤ 800 kWh/year

In addition Partner will:

- Include a manufacturer limited warranty with its qualified furnace models.

Note on Proposed AFUE Requirement for Oil Furnaces: EPA is proposing to create a separate minimum 83% AFUE level specifically for oil furnaces based on: (1) feedback received from builders in the Northeast U.S. concerning a lack of available ENERGY STAR qualified equipment and (2) concern expressed by energy efficiency program implementers in the Northeast U.S. that the limited supply of qualified oil furnaces has restricted their ability to promote efficient equipment. Unable to locate ENERGY STAR qualified oil furnaces, builders maintain that they are reverting to minimum efficiency equipment (78% AFUE).

It is EPA's understanding that the supply of oil furnaces meeting the current ENERGY STAR specification is limited for three reasons: 1) with a stagnant, mature market of 125,000 units per year, manufacturers cannot justify considerable investment in new product development; 2) oil heat is predominantly a boiler industry – consumers interested in energy efficiency are typically steered toward a boiler and combined heat and hot water system instead of an oil-fired furnace; and 3) manufacturers perceive technological difficulties with condensing technology including caustic condensate, soot build up, expense of a secondary heat exchanger, maintenance and longevity issues, etc.

When developing ENERGY STAR specifications, EPA strives to identify top performers while offering consumers options. To date, the ENERGY STAR specification does not provide a variety of manufacturers, brands, or models from which consumers can choose. An analysis was performed on the latest version of the Gas Appliance Manufacturers Association (GAMA) certified equipment database (March 2006) to determine a more feasible performance level. EPA found that a minimum 83% AFUE level would represent approximately 25% of the models currently found in the marketplace and would ensure that a number of manufacturers and brands could earn the ENERGY STAR.

Given that the majority of oil furnaces sold do not exceed minimum efficiency requirements (78% AFUE), the potential environmental benefits associated with an ENERGY STAR level of 83% AFUE is significant. Approximately 800 gallons of oil per year are used by oil furnaces for space heating (National Oil Heat Research Alliance). Furnaces can be expected to remain in service for 18 years. Fuel types #1, 2, and 4 produce 22.834 lbs of CO₂ per gallon (U.S. Department of Energy, Energy Information Administration, Residential Energy Consumption Survey) as well as sulfur oxides, nitrogen oxides, CO, unburned hydrocarbons and particulate matter.

(AFUE continued)

If the average AFUE of all furnaces sold in one year were raised just one percentage point, the CO₂ emitted over the 18 year life of those furnaces would be reduced by approximately 400 million pounds. Therefore, having builders purchasing readily available ENERGY STAR qualified equipment at 83% AFUE, rather than equipment at the minimum efficiency level of 78%, would result in considerable energy savings and environmental benefits.

Gas furnaces are not faced with the same challenges as oil furnaces. Therefore, EPA is maintaining the existing 90% AFUE requirement for gas furnaces under this specification. Approximately 24% of gas fired models currently found in the GAMA database meet the 90% AFUE requirement.

Note on Proposed Furnace Fan Efficiency Level: Over the last several months, EPA has conducted preliminary research on furnace fan efficiency, which included an analysis of the electrical efficiency (Eae) data listed in the GAMA database. What resulted was a robust dataset that provided for a wide range of differentiation based on kWh/year. Further analysis shows that the 800 kWh/year level proposed above represents approximately 50% of the models listed in the database, indicating that fan efficiency is both technically feasible and widely available in the marketplace today. When coupled with the oil and gas furnace AFUE requirements this level provides for significant savings opportunities while ensuring that many different manufacturers and models are represented.

- 4) Test Criteria: Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. Partner agrees to measure a furnace model's energy-efficiency using the following test procedures:
 - A) AFUE: as specified in 10 CFR Part 430, Appendix N.
 - B) Eae: as specified in 10 CFR Part 430, Appendix N.

- 5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR, under this Version 2.0 specification, will be defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified furnaces shall be terminated effective September 30, 2006.
 - A. Qualifying Products Under Tier I of the Version 2.0 Specification: The first phase of this specification is proposed to commence on **October 1, 2006**. All products, including models originally qualified under Version 1.3, with a **date of manufacture** on or after **October 1, 2006**, must meet the new (Version 2.0) requirements in order to qualify for ENERGY STAR. The **date of manufacture** is specific to each unit and is the date (e.g., month and year) of which a unit is considered to be completely assembled.
 - B. Qualifying Products Under Tier II of the Version 2.0 Specification: The second phase of this specification, Tier II, is proposed to commence on **October 1, 2007**. All products, including models originally qualified under Tier I, with a **date of manufacture** on or after **October 1, 2007**, must meet the Tier II requirements in order to qualify for ENERGY STAR.
 - C. EPA will not allow grandfathering under this Version 2.0 ENERGY STAR specification. **ENERGY STAR qualification under previous Versions is not automatically granted for the life of the product model.** Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time of manufacture of the product.

Note: EPA's intention in proposing the Tier I effective date above is to allow manufacturers the opportunity to qualify and promote oil furnace models, now able to meet ENERGY STAR requirements, during the upcoming heating season. EPA is also proposing that Tier II become effective one year after Tier I to ensure that all interested parties continue working toward a resolution regarding fan efficiency in a timely manner. It is EPA's hope that a decision can be made regarding furnace fan efficiency levels prior to the finalization of this specification to allow manufacturers significant time to transition to the new requirements. If continued discussions regarding fan efficiency are predicted to cause significant delays in the implementation of the new AFUE requirement for oil furnaces, EPA may elect to finalize the oil furnace requirement and amend the specification with a final Eae requirement at a later date.

- 6) Future Specification Revisions: EPA reserves the right to revise the specification should technological and/or market changes affect its usefulness to consumers or industry or its impact on the environment. In keeping with current policy, revisions to the specification will be discussed with stakeholders.