

## **Public Comments of the American Gas Association**

### **U. S. Environmental Protection Agency (EPA): “ENERGY STAR Program Requirements, Product Specification for Furnaces, Eligibility Criteria, Version 3.0: Draft 2”**

**December 29, 2010**

#### Introduction

The American Gas Association (AGA) is pleased to submit comments in response to proposed revisions to the ENERGY STAR Program Requirements covering product specifications for furnaces. AGA supports the ENERGY STAR program for energy efficient products and has been an active participant in previous ENERGY STAR activities in development of product specifications, most importantly in the promulgation of requirements for residential water heaters by the U. S. Department of Energy (DOE) during its time as the Federal lead on developing ENERGY STAR product specifications.

The AGA, founded in 1918, represents 195 local energy companies that deliver clean natural gas throughout the United States. There are more than 70 million residential, commercial and industrial natural gas customers in the U.S., of which 91 percent — more than 64 million customers — receive their gas from AGA members. AGA is an advocate for local natural gas utility companies and provides a broad range of programs and services for member natural gas pipelines, marketers, gatherers, international gas companies and industry associates. Today, natural gas meets almost one-fourth of the United States' energy needs.

AGA supports a range of diverse energy efficiency standards for buildings, appliances, and equipment consistent with AGA's "Position Statement on Building and Appliance Energy Codes and Standards" shown in Exhibit 1. In particular, AGA supports energy efficiency codes and standards that are: (1) technologically feasible and economically justified measures that benefit consumers, and (2) effective in reducing overall U. S. greenhouse gas (GHG) emissions.

#### Comments

##### Regional Efficiency Requirements

EPA should promulgate a single ENERGY STAR minimum efficiency for gas furnaces, not regionally-based dual minimum efficiencies requirements. Regionally-based requirements for the same product are not enforceable. Enforcement of ENERGY STAR label requirements to date is associated with the agency/manufacturer portion of the value chain. As such and in the context of the current proposal, all furnaces meeting the minimum efficiency of  $\geq 92\%$  AFUE would be entitled to receive the ENERGY STAR label at the factory. Where these furnaces go once they leave the factory is a separate issue facing EPA and would not be the direct responsibility of the manufacturer.

Manufacturer compliance with ENERGY STAR requirements is the traditional means of label enforcement, but it imposes a logical restriction of additional enforcement associated with regional efficiency requirements. EPA has demonstrated considerable success in enforcement

of label requirements at the manufacturer level. However, this success is doubtful for enforcement efforts downstream and including actual installation of ENERGY STAR furnaces by regions of the U. S. Because of the complexities of marketing channels downstream of the manufacturer, EPA can have no assurances of correct distribution of these products according to the intended regional scheme. Distributors, retailers, and installers are not directly under the purview of EPA's enforcement program. Taking an example of a retailer selling these products, the retailer is under no obligation to discriminate a store's regional designation for these products since it has no certainty on where the furnaces would ultimately be installed. This is especially relevant to retailers in communities that are geographically close to the regional boundaries designated by EPA.

In contrast to EPA's scheme for regional requirements here, other regional requirements for products such as state or Air Quality Management District requirements for vehicles according to emissions performance engage state and local governments in enforcement. EPA has no such state or local authority or cooperative government relationship here to enforce regional efficiency requirements.

EPA's regional approach appears to follow the so-called "consensus agreement" proposal to DOE on Federal minimum efficiencies as a model for the ENERGY STAR requirements. However, the EPA proposal shares many of the enforcement issues of the "consensus agreement" proposal, which are documented in the DOE rulemaking docket and, as of yet, are unaddressed. EPA should consult with DOE concerning its capabilities and intent regarding regional minimum efficiency standards and, based on the information and advice of the DOE effort, propose for further public review any enforcement scheme it is considering for regional efficiency requirements.

#### Equity of Requirements for Gas Heating Compared to Electric Heating Requirements

The current EPA proposals of a 92% or greater AFUE efficiency for the "U. S. South" and 95% or greater for the "U. S. North" place a disproportionate burden upon gas heating relative to competing electric heating. ***These requirements for gas furnaces impose a requirement to achieve heating efficiencies that are 11% and 14% higher, respectively, on a source energy basis compared to the ENERGY STAR requirements for competing ENERGY STAR-rated air-source heat pumps.***

As Exhibit 2 shows, source energy inefficiencies associated with both natural gas and electricity usage must be accounted for if relative efficiencies of competing systems (gas central furnaces and electric heat pumps and resistance heating) are to be compared. Using data from the U. S. Energy Information Administration (EIA) Annual Energy Outlook and related EIA sources, efficiency losses upstream of direct gas consumption account for approximately 8% of energy produced, while for electricity efficiency losses account for 68% of energy produced, based on national average data. Use of source energy as the basis for energy efficiency comparisons is consistent with the recommendations of the National Research Council's Committee on Point-of-Use and Full-Fuel Cycle Measurement Approaches to Energy Efficiency Standards for use in appliance efficiency minimum efficiency rulemakings.<sup>1</sup>

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<sup>1</sup> Committee on Point-of-Use and Full-Fuel-Cycle Measurement Approaches to Energy Efficiency Standards, National Research Council, "Review of Site (Point-of-Use) and Full-Fuel-Cycle Measurement Approaches to DOE/EERE Building Appliance Energy-Efficiency Standards," May 15, 2009.

In making the comparisons of ENERGY STAR requirements, stated above, AGA used the proposed minimum efficiency requirements for gas furnaces (92% and 95% AFUE) for comparison with the current minimum Heating Seasonal Performance Factor (HSPF) efficiency requirements for air-source heat pumps in the ENERGY STAR program (8.2 HSPF). Equivalent heating performance was calculated using the conversion methods documented from the ENERGY STAR website. These conversions allow calculating equivalent AFUE factors for HSPF-rated heat pumps. Both gas furnace AFUEs and equivalent AFUEs for heat pumps were converted to source-adjusted efficiencies using the 8% national average loss factor for gas and 68% national average loss factor for electricity.

In addition to this disparity in energy efficiency requirements, the proposed gas furnace minimums for ENERGY STAR carry associated estimated cost premiums, installed, compared to competing air-source heat pumps. Using data from the DOE Technical Support Documents (TSDs) for the 2007 minimum efficiency rulemaking for furnaces<sup>2</sup> and the preliminary TSD for 2010 for heat pumps and air-conditioners,<sup>3</sup> ***the cost premiums for a 92% AFUE furnaces and a 95% furnaces are estimated to be 51% and 77% over competing heat pumps, respectively.*** In making this cost comparison, AGA used the DOE national installed cost estimates for Efficiency Level 4 split system heat pumps (14.5 SEER/8.15 HSPF) shown in Table 8.4.21 of the TSD and the national installed cost estimates for both coil-only air conditioners (rated at 14.5 SEER) shown in Table 8.4.9 and furnaces from the furnace rulemaking TSD (rated at 92% AFUE and 96% AFUE) shown in Table 11.2.4. Inclusion of coil-only air conditioner installed cost with furnace costs is necessary for comparison of systems with similar functionality.

As a result, the proposed minimum efficiency requirements for gas furnaces would impose a significant installed cost bias within the ENERGY STAR program against gas furnaces in favor of electric heat pumps, with lower efficiency and high associated carbon footprints due to the current electric generation mix in the U. S. Current uses of the ENERGY STAR label for rebates and other incentives do not account for these disparities in efficiencies and installed costs and would promote a bias against gas heating systems carrying the ENERGY STAR label compared to competing ENERGY STAR electric heat pumps.

Beyond comparisons of ENERGY STAR products, EPA needs to recognize the increased potential for electric resistance heating systems, and their associated source energy efficiencies and carbon contributions, as a builder and consumer alternative to higher-cost ENERGY STAR gas furnaces since electric resistance heating, including electric furnaces, are unregulated. In installing electric heating systems with an ENERGY STAR labeled air conditioner, customers are likely to claim ENERGY STAR status of their HVAC system, regardless of the status of the heating system.

In view of these issues, AGA believes that EPA should maintain the current ENERGY STAR minimum efficiency for gas furnaces at 90% AFUE, at least until heat pump efficiency requirements can be increased to comparable minimum efficiencies (e.g., 9.1 HSPF for the competing minimum AFUE requirement of 92% for gas furnaces, based on AGA calculations).

#### Differences in Estimated Installed Cost for Gas Furnaces: EPA and DOE

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<sup>2</sup> "Technical Support Document: Energy Efficiency Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers," U. S. Department of Energy, September 2007.

<sup>3</sup> "Preliminary Technical Support Document (TSD): Energy Efficiency Program for Consumer Products and Industrial Equipment: Residential Central Air Conditioners and Heat Pumps," U. S. Department of Energy, March 2010.

AGA encourages EPA to work with DOE to resolve differences in estimated installed costs for high efficiency gas furnaces to achieve greater consensus and reliability of consumer information on economic considerations for choosing these types of heating systems over more common, non-ENERGY STAR labeled systems. EPA's economic and payback calculations are markedly inconsistent with the DOE installed costs used in its TSD for minimum efficiency systems published in 2007. Average paybacks calculated by DOE range from 13 to 61 years, according to the efficiencies and regional heating loads analyzed. EPA's payback calculations (ranging from 2 to 22 years) cannot be characterized as "conservative."

A fundamental issue of EPA's payback calculations, and a major source of differences with the analysis of DOE, is estimated installed cost. EPA incorrectly associates the differences in installed costs between EPA data and the DOE TSD with decreases in installed costs over time, instead of the direct source of differences: different methodologies for estimating installed cost. EPA uses survey data for its costs. DOE uses an engineering cost calculation and markup methodology for its costs. It is unclear which costs are more appropriate, but these methodologies are clearly inconsistent and the results incompatible. Since DOE's costs are published and part of the rulemaking docket, EPA should make efforts to come to consensus with DOE on the appropriate costs, especially since as EPA staff has stated that the data is for use as consumer information. Currently, the DOE costs represent publicly reviewed documentation and most appropriate for dissemination to consumers. EPA also attributes a "decline" in installed cost for higher efficiency furnaces to greater installer experience since 2005-06 (i.e., when the 2007 TSD data was compiled). However, it is widely understood that installation of Category IV furnaces has been going forward for many years before this timeframe.

Beyond these differences, both DOE and EPA are not accounting fully of installation-related costs, especially in furnace replacement installations where Category I common-vented systems are replaced with Category IV systems. These cost adders, estimated to be between \$1,500 and \$2,000 for replacement of Category I common-vented systems, are not included in either DOE or EPA's costs. EPA is using DOE's estimate of incremental costs of \$293, which according to AGA's data grossly underestimates installation costs for replacement installations. AGA has maintained data on cost adders for these replacements over the last five years, and Exhibit 3 summarizes the AGA data.

AGA recommends that EPA suspend use and publication of estimated paybacks until these issues are resolved, especially since ENERGY STAR, as a voluntary Federal program, has no direct responsibility for justifying its proposed program requirements on consumer payback or related consumer economic calculations. In contrast, DOE has statutory requirements for such calculations. Also, DOE's impending issuance of a Notice of Proposed Rulemaking (NOPR) on these products is expected to include updated life-cycle cost and payback estimates, in part based on updated installed cost estimates. EPA should not be issuing estimates of this type in view of what AGA believes will be an inevitable continuation of inconsistency.

This concludes AGA's comments on the Version 3.0, Draft 2 requirements. AGA looks forward to participating in the upcoming stakeholder webinar on January 6, 2011 and is prepared to discuss its comments.

Respectfully submitted,  
AMERICAN GAS ASSOCIATION  
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**What We Are For  
American Gas Association (AGA) Positions  
On Building and Appliance Energy Codes and Standards**

**AGA's positions on building and appliance energy codes and standards support:**

- 1) Technologically feasible and economically justified measures that benefit consumers, *and***
- 2) Measures that reduce overall U.S. greenhouse gas emissions.**

**AGA does *not* support energy efficiency measures that lead to net increases in U.S. greenhouse gas emissions.**

- 1. AGA supports (1) measurement of energy consumption and efficiency and (2) development of efficiency approaches based on full-fuel-cycle and source energy evaluation of fossil fuel-fired and transport system energy losses.**
- 2. AGA supports all energy efficiency codes and standards that are “technologically feasible and economically justified,” consistent with federal statutory requirements for minimum efficiency standards for appliances and equipment.**
- 3. AGA supports coherent use of minimum efficiency codes and standards with market based approaches and incentives to achieve market transformation and economically justified levels of end use efficiency (i.e., an “energy efficiency portfolio” approach), recognizing that individual methods have both limitations and potentials for unintended consequences including increased energy consumption and emissions.**
- 4. AGA supports incentives including tax credits, tax deductions, and utility-based rebates and subsidies for energy efficient appliances and equipment commensurate with the opportunities to reduce energy consumption and emissions.**
- 5. AGA supports adoption of performance-based approaches for appliances and buildings as the most efficient means of achieving energy efficiency and emissions objectives. Performance-based approaches are superior to simplistic prescriptive requirements, which may not achieve equitable results across energy types.**
- 6. AGA support codes that permit consideration of full energy choice in performance rating and the specification and selection of appliances and equipment as a means of achieving the most economically efficient energy and emissions savings.**
- 7. AGA supports expansion of use of renewable energy in buildings by supporting installation of natural gas as a primary backup energy source.**
- 8. AGA supports research, development, and demonstration (RD&D) of new energy efficient natural gas appliances and equipment as a means of extending the efficient use of natural gas resources, reducing the emissions contributions from natural gas end use, and helping consumers control costs of energy services.**

Exhibit 2.

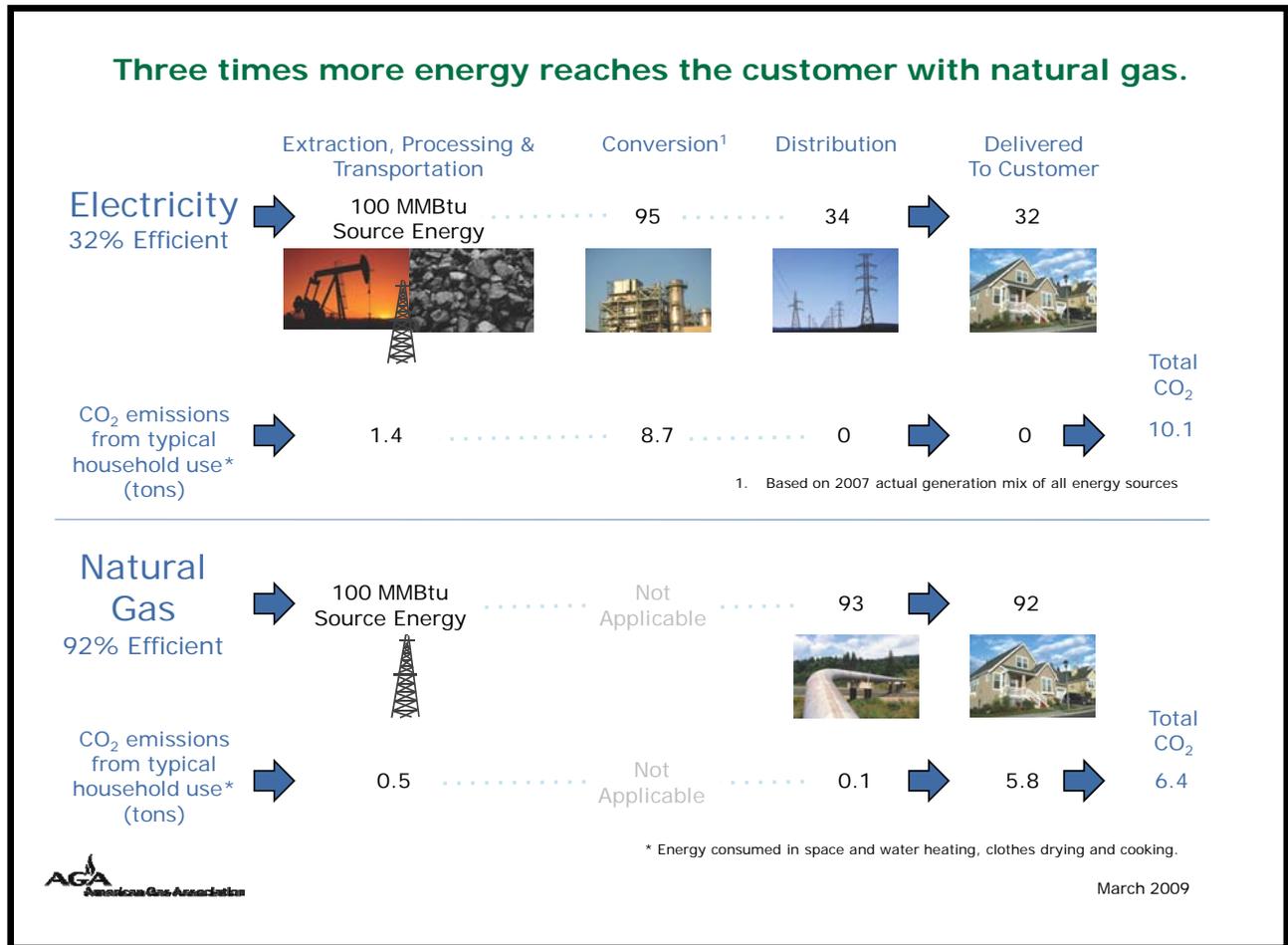


Exhibit 3.

**Estimated Added Cost of Installation of  
90% AFUE Furnaces in Common Vented Systems<sup>1</sup>**

*The following estimated costs were compiled from estimates provided by AGA member companies through the AGA BECS Committee in support of AGA's comments on the 2007 DOE Final Rule on minimum efficiencies for residential non-weatherized furnaces.*

<b><u>Additional Venting System/Installation Requirements<sup>2</sup></u></b>	<b><u>Range of Est. Cost (\$2005)<sup>3</sup></u></b>
Reline existing chimney or resize vent to accommodate the remaining appliance (code requirement for proper vent sizing)	\$600 - \$1,000
Install drain pan for condensate from condensing furnace (code requirement to avoid structural damage)	\$150 - \$250
Install freeze protection for condensate line to ensure reliability of disposal (for installation outside of conditioned space)	\$200
Perform structural modifications (including boring holes in interior walls, floors, exterior walls for vents and new vent termination kit)	\$300 - \$450
Install condensate drain, pump, acid neutralizer, etc.	\$250 - \$300
<b>Total Added Cost:</b>	<b><u>\$1,500 - \$2,200</u></b>

<sup>1</sup> Common vented systems typically vent both furnace and water heater in single negative pressure venting configuration. A positive pressure condensing combustion appliance, such as a 90% AFUE furnace, cannot be common vented in these systems since venting requires positive vent pressures. As a result, replacement of furnaces using negative pressure venting with furnaces using positive pressure venting requires a new venting system and, in many cases, retrofit of the remaining negative pressure venting system to accommodate reduced vent flows.

<sup>2</sup> Requirements over and above installation cost adders for furnace replacement with 80% AFUE furnaces.

<sup>3</sup> Estimates limits rounded to the nearest \$50 increment.