AMERICAN PUBLIC GAS ASSOCIATION

April 22, 2013

Kathleen B. Hogan
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

RE: Docket No. EERE-2013-BT-TP-0008-000, RIN 1904-AC96

Dear Ms. Hogan:

The American Public Gas Association (APGA) is pleased to submit comments in response the to notice of proposed rulemaking regarding test procedures for two-stage and modulating condensing furnaces and boilers issued by the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), in the Federal on February 4, 2013.[1]

APGA is the national association for publicly-owned natural gas distribution systems. There are approximately 1,000 public gas systems in 36 states and over 700 of these systems are APGA members. Publicly-owned gas systems are not-for-profit, retail distribution entities owned by, and accountable to, the citizens they serve. They include municipal gas distribution systems, public utility districts, county districts, and other public agencies that have natural gas distribution facilities. For more information, please visit www.apga.org.

The Energy Policy and Conservation Act, 42 U.S.C, § 6293, sets forth criteria and procedures that DOE must follow when prescribing or amending test procedures for covered products, including natural gas furnaces. The Act provides that test procedures must be reasonably designed to produce test results which measure energy efficiency, energy use, or estimated annual operating cost of a covered product during a representative average use cycle or period of use, and must not be unduly burdensome to conduct.

APGA believes that energy descriptors should reflect full-fuel-cycle energy metrics that allow for the comparison of products for which there is a choice of fuels. A source or full-fuel-cycle analysis examines all impacts associated with energy use, including those from extraction/production, conversion/generation, transmission, distribution, and ultimate energy consumption.

[1] *Energy Conservation Program for Consumer Products: Test Procedure for Residential Furnaces and Boilers,* 78 FR 7681 (February 4, 2013).

Full-fuel-cycle metrics enable a more comprehensive analysis of the total energy usage and environmental impacts associated with of appliance energy efficiency standards. Full-fuel-cycle metrics would also level the playing field for appliances that can use different fuels by providing a proper basis for comparing energy usage and efficiency. By way of example, for appliances that use natural gas most of the energy losses and emissions occur at the point of use. The overall natural gas delivery system, from extraction and production, through processing, transportation, and delivery to end use is relatively efficient – approximately 92% of the energy produced reaches the consumer as usable energy, where electricity is only about 32% efficient, with about 64% lost in generation.[2]

For these reasons, The National Academies (of Science, of Engineering, Institute of Medicine, and the National Research Council), in a report dated May 15, 2009, recommended that the DOE consider moving over time to the use of a full-fuel-cycle measure of energy consumption in its conservation standard program. In particular, the National Academies recommended that for appliances for which there is a choice of fuel, efficiency ratings should be calculated using an extended site energy metric pending a transition to the use of full-fuel-cycle energy metrics.[3] In response to the National Academies' report, DOE issued a Statement of Policy (SOP) announcing its plans to adopt full-fuel-cycle energy analyses into their Energy Conservation Standards Program.[4] Specifically, DOE stated its intention to use full-fuel-cycle energy measures of energy use and emissions, rather than site energy measures.

Natural gas is the cleanest, safest, and most useful of all fossil fuels. The inherent cleanliness of natural gas compared to other fossil fuels, as well as strong domestic supply projections and superior efficiency of natural gas equipment, means that substituting gas for the other fuels will reduce the emissions of the air pollutants that produce smog, acid rain and exacerbate the "greenhouse" effect. Natural gas is the lowest CO2 emission source per BTU delivered of any fossil fuel. Using gas-fired appliances for homes instead of electric ultimately reduces greenhouse gas emissions by one-half to two thirds. Simply put, increasing the direct-use of natural gas is the surest, quickest, and most cost-effective avenue to achieve significant reductions in greenhouse gases and therefore should be a critical component of any green buildings certification program. One consequence of using a site-based metric is to promote fuel switching in the design decision away from more full-fuel-cycle energy efficient and lower greenhouse gas emitting gas technologies toward more site energy efficient electric technologies. To promote energy efficiency and lower greenhouse gas emissions, a full-fuel-cycle metric should be used.

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[2] U.S. Energy Information Administration, *Annual Energy Review 2011*, Table 2.1b.

[3] The National Academies Press, 2009. National Academy of Sciences Letter dated May 15, 2009 at p. 12 ("Recommendation 3: For appliances for which there is a choice of fuel, such as storage water heaters and heating equipment, efficiency ratings should be calculated using the extended site measure of energy consumption until DOE/EERE can consider and complete a transition to the use of the full-fuel-cycle measure of energy consumption.").

[4] *Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment; Statement of Policy for Adopting Full-Fuel-Cycle Analyses Into Energy Conservation Standards Programs*, 76 Fed. Reg. 51281 (Aug. 18, 2011).

It is the position of APGA that DOE should follow-through on its commitment to incorporate a meaningful use of full-fuel-cycle measures of energy use and emissions in the test procedures for residential furnaces. To overcome the site-based shortcomings identified the National Academies and to remedy the disconnect between DOE's current methodology and the robust full-fuel cycle approach recommended, APGA strongly urges DOE to employ a secondary energy descriptor to capture full-fuel cycle efficiency in line with the recommendations from the National Academies.

The National Academies made recommendations which are applicable to the implementation of a secondary descriptor. For example, inclusion of a descriptor adjustment calculation for the current AFUE rating to allow:

- Direct comparability of gas furnace efficiencies to heat pump HSPFs in terms of site energy consumed, and

- Scaling of these site ratings to full fuel cycle efficiencies using these site energy consumption calculations for comparison of these competing products on a full fuel cycle basis.

This linkage is essential to address one of the National Academies' recommendations since simply adding full fuel cycle information to the furnace rating procedures will only allow comparisons between gas and electric furnaces, which are rated on AFUE, while ignoring comparisons to heat pumps. Since a comparison between AFUE and HSPF (i.e., on either a site energy or full fuel cycle energy basis) cannot be done, end-use consumers are either not well-served or not served at all by the current descriptors.

While the Act requires the measurement of energy use on a "site" basis, it does not preclude the use of additional or secondary energy descriptors that provide useful information to consumers on the energy consumption and environmental impacts of their appliance choices. Moreover, implementing an extended site or full-fuel-cycle energy descriptor would not require alteration of any test methods for the appliances. Rather, a simple calculation can be done using the primary (site-based) energy descriptor as an independent variable.

Below is an illustration of how that calculation would be performed to establish full-fuel-cycle energy descriptors for certain natural gas and electric furnaces:

Comparison of Site vs. Source
Warm Air Furnace
AFUE

Energy Source	$AFUE_{site}$	$AFUE_{full\ fuel\ cycle}$
Natural Gas:	0.80	0.73
Natural Gas:	0.90	0.83
Electric Resistance:	0.98	0.31

Adding this adjustment for site and full fuel cycle comparability within the furnace test procedures is an important opportunity to formalize during the calculation methodology. Since

the rulemakings for furnace test procedures and heat pump test procedures are on different timelines, the furnace test procedures presents the most immediate opportunity to remedy this omission and follow-through on its expressed intention set forth in DOE's August 2011 SOP.

APGA thanks the Office of Energy Efficiency and Renewable Energy for its consideration of these comments.

Respectfully submitted,

Bert Kalisch, CEO
American Public Gas Association
202.464.2742
bkalisch@apga.org