

Energy Conservation Program: Test Procedures for Residential Water Heaters and Commercial Water Heaters— 10 CFR Part 430 [Docket Number EERE–2011–BT–TP–0042] RIN 1904–AC53

Comments from American Public Gas Association  
February 11, 2013

## INTRODUCTION

The American Public Gas Association (APGA) appreciates this opportunity to submit comments in response to the Request for Information (RFI) issued by the U.S. Department of Energy (DOE) on January, 11, 2013, to initiate the rulemaking and data collection process to develop a uniform efficiency descriptor and accompanying test method for residential water heaters and commercial water heaters (78 FR 2340).

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.

### I. Site v. Source Based Efficiency Analysis

APGA has long supported a full fuel cycle (source based) approach to energy analysis. A full fuel cycle approach is most appropriate when comparing the energy efficiency of various appliances. A full fuel cycle analysis examines all impacts associated with energy use, including those from extraction/ production, conversion/generation, transmission, distribution, and ultimate energy consumption. Site (or point-of-use) measurement fails to account for the energy losses expended between the processes of energy extraction through delivery to the point of final consumption, when comparing energy use intensity of optional fuels. Site-based measurement of energy consumption and efficiency favors technologies that result in the consumption of greater quantities of raw energy, and therefore, emission of greater quantities of pollutants.

In 2011, the Department of Energy (DOE) issued a Statement of Policy announcing its plans to adopt full-fuel-cycle analyses into their Energy Conservation Standards Program, based on recommendations to that effect by The National Academies of Sciences. APGA urges DOE to honor its commitment to full fuel cycles metrics in the development of a uniform descriptor and test procedures for water heaters.

### II. ASHRAE standard 118.2, 'Method of Testing for Rating Residential Water Heaters'

When drafting the testing procedures we believe that the Department of Energy should consider ASHRAE's standard 118.2, 'Method of Testing for Rating Residential Water Heaters,' which is currently under revision. ASHRAE is an ANSI accredited standards developer that is internationally recognized. Standard 118.2 will provide testing changes as well as potential changes to energy descriptors.

### III. Metrics

Under the National Appliance Energy Conservation Act (NAECA), residential water heaters are rated for efficiency by DOE<sup>1</sup>, whereby the performance of an established MOT results in an Energy Factor (EF) rating for efficiency and a First Hour Rating (FHR)/Maximum Flow (gpm) for capacity. If a water heater is

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<sup>1</sup> Dept. of Energy. *Energy Conservation Program for Consumer Products: test Procedure for Water Heaters*. 10 CFR Part 430, 1998.

considered a commercial product, it is instead rated by through the Energy Policy Act (EPAct), whereby a Thermal Efficiency (TE) and Standby Loss (SL) are defined<sup>2</sup>. For gas-fired water heaters, the distinction between residential and commercial water heaters is significant. Only residential water heaters are eligible for the Energy Star® designation, a recognized market driver for high-efficiency water heating, and the Federal Trade Commission prevents water heater manufacturers from publishing an EF for commercial products, thus limiting the consumer from comparing products.

#### IV. Draw patterns

As noted in the RFI, the draw pattern in any test procedures will have an effect on the accuracy of the results. For water heaters, the delivered efficiency is strongly a function of daily hot water consumption. For example, in storage water heaters, efficiency increases with the load as they operate closer to steady-state, where the standby losses are a smaller fraction of total heat output. Tankless water heaters similarly benefit by operating closer to steady state with a larger daily hot water load, and additionally benefit by reducing the impact of cyclic/startup losses, which due to hot water draw intermittency have lead several groups to “de-rate” the efficiency of units by up to 9%. Thus, the EF rating will be affected by the type of water heater and the draw pattern. Although DOE has stated that implementing multiple draw patterns will lead to added test time and more complicated testing, without such multiple draw patterns in the testing procedures, certain water heaters may be inaccurately rated.

Respectfully submitted,  
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<sup>2</sup> Dept. of Energy *Uniform test method for the measurement of energy efficiency of commercial water heaters and hot water supply boilers (other than commercial heat pump water heaters)*, 10 CFR 431.106, 2012.