



April 12, 2016

Ms. Abigail Daken
U.S. Environmental Protection Agency
Energy Star HVAC Program

Subject: Energy Star Commercial Boiler Program

Dear Ms. Daken,

Raypak, Inc. is a wholly-owned subsidiary of the Rheem Manufacturing Company. Raypak is a manufacturer of Commercial Boilers, Commercial Water Heaters, Residential Boilers, and Pool Heaters located in Oxnard, CA. We have been manufacturing commercial boilers since 1948. We thank you for the opportunity to comment on the updates to Draft 1, version 1.0 of the proposed Commercial Boiler Energy Star specification as published on March 23, 2016. We have a few items that we would like to put forward for consideration as you progress through the analysis of including commercial boilers into an Energy Star program in advance of your release of a Final Draft.

EPA notes in the proposal that EPA identified a clear distinction between condensing and non-condensing boilers at 92.0% TE – according to your review of the AHRI certified products directory. We take exception to this as there is a clear distinction between condensing and non-condensing products at levels at 85.0% CE (dependent on net flue temperature and CO₂ in the flue gases). The Vent categorization test in the ANSI Z21.13/CSA 4.9 standard clearly identifies and distinguishes between condensing and non-condensing products. Calculations show that the line between condensing and non-condensing occurs around 85.0% CE. As such, we reiterate our desire for this Energy Star program to begin with 90.0% TE (or ~91.0% CE for boilers larger than 2,500,000 Btu/hr) which is similar to what has been done with the Residential Boiler Energy Star program (90.0% AFUE). This alignment creates an opportunity in the future to provide for a “Most Efficient” classification of ~94.0% TE (~95.0% CE) which also is similar to what is currently done for the Residential Boiler Energy Star program.

EPA introduces the metric of Combustion Efficiency (CE) for commercial boilers larger than 2,500,000 Btu/hr up to and including 5,000,000 Btu/hr in accordance with the DOE current metric for boilers in this classification and an Energy Star proposed level of >95.0% CE while the proposed level for commercial boilers equal to or greater than 300,000 Btu/hr and less than or equal to 2,500,000 Btu/r is $\geq 94.0\%$ TE. While it may be simply a typographical mistake, Raypak believes that the proposed level was intended to be $\geq 95.0\%$ CE to be consistent – please confirm.

While the document does not specifically state the turndown ratio requirements for commercial boilers above 2,500,000 Btu/hr, are we to assume that it is the same as noted for commercial boilers less than or equal to 2,500,000 Btu/hr ($\geq 5:1$ turndown ratio)?

EPA should be aware of another item concerning the efficiency metric for commercial boilers which relates to a new ASHRAE standard (ASHRAE 155P) that has been under development for many

years to address DOE concerns about measuring efficiencies at part load conditions as part of the efficiency metric to be adopted by DOE. We are unsure how these new efficiency measurements per the ASHRAE 155 standard might affect the new efficiency metric when this new standard is implemented and adopted by DOE. As such, it would be better to adopt the $\geq 90.0\%$ TE ($\sim \geq 91.0\%$ CE) level at this time to avoid a potential situation when any new efficiency metric might not be able to conform to the extremely high efficiency levels that EPA is proposing under this Energy Star program.

EPA noted that “an installed base of 1.4 million non-condensing boilers, out of a total of 1.6 million installed boilers, offers a tremendous national energy and carbon savings potential for the retrofit market.” However, EPA is not considering the tremendous expense involved in retrofitting a commercial installation with condensing boilers. Please note that the retrofit is NOT as simple as simply replacing a non-condensing boiler with a condensing boiler. If EPA is truly concerned about realizing real energy savings through this program, the entire heating system in the commercial building must be overhauled to take advantage of the lower water temperatures where condensing boilers are really effective and efficient. Failure to properly evaluate the direct and indirect effects associated with a retrofit (at substantial cost and interruption to commercial facilities) will result in little, if any, cost/energy savings to the end user and could actually result in higher energy usage as condensing boilers do not operate as efficiently as many non-condensing boilers at higher water temperatures. If condensing boilers operate at lower water temperatures (to take advantage of the condensing opportunities), there are less Btu’s available in the water for heating the conditioned space. As such, the surface area of the heating system must be increased to meet current heating requirements OR the customer will simply raise the thermostat to call for more heat until an acceptable comfort level is attained. This will be counter-productive to the desire to reduce energy consumption.

Raypak would like to see some other requirements added to the Energy Star program whereas the system is properly sized and equipped to handle condensing boilers at lower operating water temperatures before being classified or qualified as Energy Star products. Even though boilers MAY be capable of operating in efficient ranges, it does NOT mean that they WILL be installed to operate in this manner. Raypak is not sure how this more comprehensive qualification could be accomplished and that is one of the reasons why Raypak has not been in favor of an Energy Star program for Commercial Boilers. Raypak believes a more robust discussion is needed between ENERGY STAR and industry stakeholders before moving forward with an Energy Star program for this category of boilers.

Thanks you again for the opportunity to present these concerns and we look forward to working with the EPA to improve this process as needed.

Regards,



Robert S. Glass
Sr. Staff Engineer