Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy

April 25, 2013

Ms. Brenda Edwards
U.S. Department of Energy
Building Technologies Program
1000 Independence Avenue, SW
Mailstop EE-2J
Washington, DC 20585

RE: Docket Number EERE–2012–BT–STD–0029/ RIN 1904–AC82: Framework Document for Packaged Terminal Air Conditioners and Heat Pumps

Dear Ms. Edwards:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP) and the American Council for an Energy-Efficient Economy (ACEEE) on the framework document for packaged terminal air conditioners (PTACs) and packaged terminal heat pumps (PTHPs). 78 Fed. Reg. 12252 (February 22, 2013). We appreciate the opportunity to provide input to the Department.

We are concerned that the current test procedure for PTACs and PTHPs does not capture the benefits of technologies such as variable-speed compressors and variable-speed fans, which can achieve energy savings in the field, but which do not increase EER or COP as measured by the test procedure. Currently, manufacturers have little incentive to adopt technologies that increase part-load efficiency since part-load efficiency is not captured by the test procedure. Below are our comments on test procedures in addition to brief comments on technology options and "max tech" levels.

Test Procedures

In the 2008 final rule for PTACs and PTHPs, DOE considered variable-speed compressors, fan motor controllers, clutched motor fans, and thermal expansion valves as technology options. However, while DOE noted that these technologies can reduce energy consumption in the field, DOE eliminated them from the analysis because they do not increase EER or COP as measured by the test procedure.[1]

We encourage DOE to develop a test procedure that captures part-load efficiency in order to better represent efficiency in the field. This would encourage the adoption of technologies that can achieve significant energy savings, but which do not improve efficiency as measured by the current test procedure. One potential approach would be to adopt a metric similar to the IEER metric for commercial packaged air conditioners and heat pumps. The IEER test procedure measures efficiency at different load points (100%, 75%, 50%, and 25% of full capacity at

[1] Final Rule Technical Support Document. Chapter 4.

different outdoor temperatures), and can therefore capture the part-load efficiency benefits of technologies such as variable-speed or staged compressors and variable-speed fans.

Technology Options

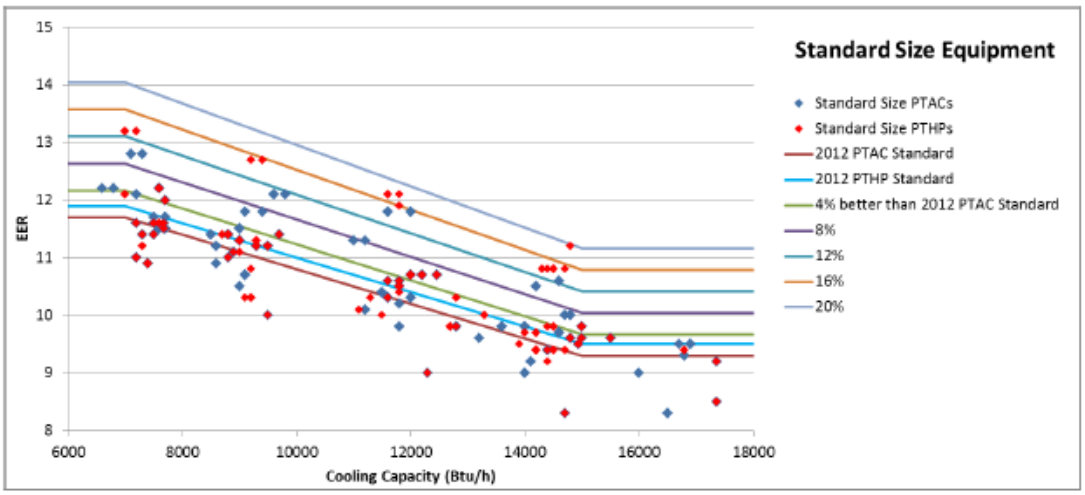
In the framework document, DOE identified microchannel heat exchangers as a potential technology option.[2] Microchannel heat exchangers can increase efficiency without increasing the size of an air conditioner or heat pump, which is particularly relevant for PTACs and PTHPs since they are designed for fixed wall sleeve dimensions. We are unaware of commercially available PTACs or PTHPs that employ microchannel heat exchangers. However, the website of Zess Inc. indicates that their company is developing an integrated microchannel refrigeration system for applications in PTAC units. Zess Inc. estimates that PTACs employing their microchannel refrigeration system could reach EER levels as high as 15.[3]

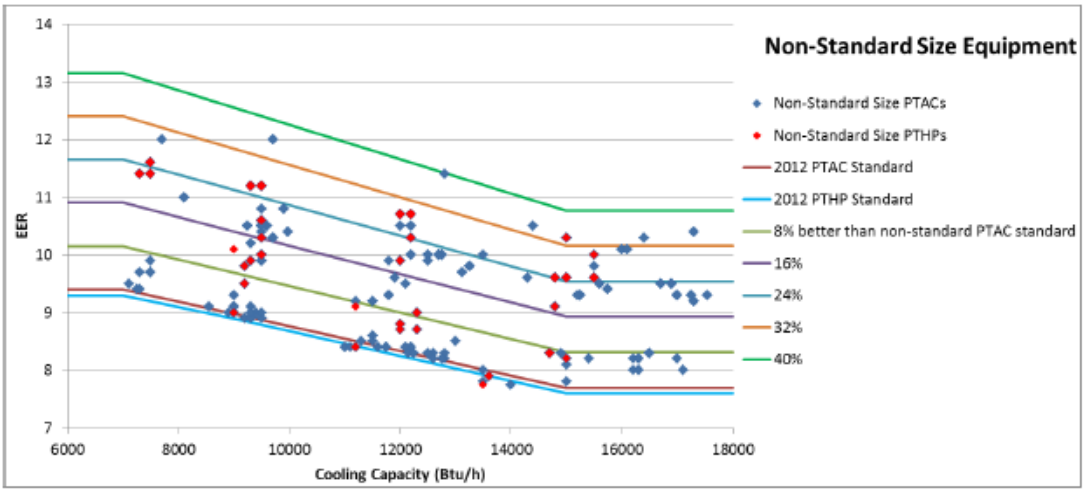
In a 2011 scoping report on PTACs and PTHPs, ENERGY STAR identified microgroove heat exchangers as a technology option for improving efficiency.[4] Microgroove heat exchangers, which use smaller diameter copper tubes, can provide better heat transfer than conventional heat exchangers. We encourage DOE to include microgroove heat exchangers as a technology option if they have the potential to improve the efficiency of baseline products.

Max Tech Levels

The framework document states that DOE is proposing to analyze efficiency levels for standard-size PTACs and PTHPs that are 4%, 8%, 12%, 16%, and 20% more efficient than the current standards, and efficiency levels for non-standard-size PTACs and PTHPs that are 8%, 16%, 24%, and 32% more efficient than the current standards.[5] The graphs below from the framework document show the proposed efficiency levels for the analysis for standard-size and non-standard-size equipment along with current products in the AHRI directory.

[2] Framework Document. p. 20.
[3] http://www.zessindustries.com/zess/index.php?option=com_content&task=view&id=18.
[4] http://www.energystar.gov/ia/products/downloads/ESTAR_PTAC_and_PTHP_Scoping_Report_Final_Dec_2011.pdf. p. 2.
[5] Framework Document. pp. 25-26.





As can be seen in the graphs above, the proposed efficiency levels for the analysis capture the range of efficiencies of currently available PTACs and PTHPs. However, the maximum available efficiency level is not necessarily equivalent to the maximum technologically feasible level. DOE must evaluate a true "max tech" level, which we expect would be higher than the efficiency level of the most-efficient commercially available products.

Thank you for considering these comments.

Sincerely,

Joanna Mauer
Technical Advocacy Coordinator
Appliance Standards Awareness Project

Harvey Sachs
Senior Fellow
American Council for an Energy-Efficient Economy