UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF AIR AND RADIATION

January 23, 2020

Dear ENERGY STAR® Brand Owner or Other Interested Party:

The U.S. Environmental Protection Agency (EPA) is pleased to announce the selection of Refrigerators with Advanced Adaptive Compressors as a 2020 ENERGY STAR Emerging Technology Award category. EPA is proposing performance criteria for these products with the goal of recognizing the best available advanced adaptive compressors that help protect the environment while offering the consumer new ways to save energy.

Overview of the Emerging Technology Award
Launched in 2011, the ENERGY STAR Emerging Technology Award raises the profile of innovative technologies that have the potential to significantly reduce greenhouse gas emissions once more widely adopted. The annual Award recognizes promising technologies that may not yet meet key principles associated with categories eligible for the ENERGY STAR label (e.g., broadly available, cost effective to the consumer) or may represent large improvements in existing ENERGY STAR product categories. As products become more mainstream, Award categories may become candidates for ENERGY STAR specification development. For more information on the Award, visit www.energystar.gov/emergingtech.

Technology Overview – Advanced Adaptive Compressors:
In a conventional refrigerator, the compressor operates at maximum capacity in response to thermal load, or it is turned off when the desired temperature has been achieved. However, the energy consumption requirements of a refrigerator vary widely based on various factors. An advanced adaptive compressor system in residential refrigeration products pairs an inverter compressor with a sensor-driven control system capable of cooling capacity modulation in response to a varying internal thermal load. As a result, the advanced adaptive compressor system allows for the refrigerator to save a significant amount of energy while regulating the temperature by minimizing wide temperature variations. The per unit efficiency increases by at least 25% with this technology when compared to standard units. If all refrigerators sold in 2020 in the U.S. used this technology and met these draft criteria, the energy cost savings would exceed $160 million.

Draft Criteria for Review
Interested stakeholders are encouraged to provide feedback on the proposed recognition criteria to emergingtech@energystar.gov **by February 28, 2020**. Depending on the comments received, EPA may release a subsequent draft for stakeholder review prior to finalizing the criteria. Once final, manufacturers of refrigerators that meet the Award criteria will be able to submit information and data to EPA for review. Upon EPA approval, manufacturers will be able to use the ENERGY STAR Emerging Technology Award logo to promote the product.

Additional Technology Categories for 2020: Air-to-Water (ATW) Heat Pumps
To date there have been two companies that earned an Award for Air-to-Water Heat Pumps: Chiltrix Inc. and Mestek, Inc. With this letter, and to allow the new market to further develop, EPA is extending recognition of the 2019 Award category – Air-to-Water Heat Pumps – into 2020. This category of heat

pumps has numerous applications with advantages over traditional hydronic systems in new and existing homes, and advantages over forced air systems in new construction. Compared to a typical gas condensing boiler system, Air-to-Water heat pumps can offer energy savings up to 47%[1] with a seasonal Coefficient of Performance (COP) of 1.7 - 3.0. In new construction, Air-to-Water heat pumps provide all the advantages of a hydronic system while also providing efficient electric heat, using up to 70% less electricity than electric baseboard heat.

Air-to-Water systems also demonstrate superior performance at low outdoor temperatures when compared with traditional air source heat pumps, making them appropriate for use throughout the United States, including cold regions. Please see www.energystar.gov/emergingtech for award criteria and instructions for new submissions.

If you have any questions about the Award or the criteria development process, please contact me, Peter Banwell, at banwell.peter@epa.gov and (202) 343-9408, or Emmy Feldman at emmy.feldman@icf.com and (202) 862-1145.

Best Regards,

Peter Banwell
ENERGY STAR Program

Enclosures:
Draft Criteria for Advanced Adaptive Compressors

[1] Typical condensing boilers are approximately 90-98.5% efficient (measured using AFUE), while ATW heat pumps are at least 170% efficient at 5 degrees F, (measured using COP).