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December 9, 2013

Via E-Mail

Amanda Stevens  
U.S. Environmental Protection Agency  
ENERGY STAR Appliance Program  
appliances@energystar.gov

Re: ENERGY STAR Room Air Conditioner Framework Document

Dear Ms. Stevens:

On behalf of the Association of Home Appliance Manufacturers (AHAM), I would like to provide our comments on the Environmental Protection Agency's (EPA) ENERGY STAR Room Air Conditioner Framework Document (Framework Document).

AHAM represents manufacturers of major, portable and floor care home appliances, and suppliers to the industry. AHAM's membership includes over 150 companies throughout the world. In the U.S., AHAM members employ tens of thousands of people and produce more than 95% of the household appliances shipped for sale. The factory shipment value of these products is more than \$30 billion annually. The home appliance industry, through its products and innovation, is essential to U.S. consumer lifestyle, health, safety and convenience. Through its technology, employees and productivity, the industry contributes significantly to U.S. jobs and economic security. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs.

AHAM supports EPA and the Department of Energy (DOE) in their efforts to provide incentives to manufacturers, retailers, and consumers for continual energy efficiency improvement, as long as product performance can be maintained for the consumer. AHAM does not have a position on whether there should be a revised ENERGY STAR specification for room air conditioners, but provides the following comments in response to EPA's specific requests. With regard to portable air conditioners, AHAM would support an ENERGY STAR program for those products as more fully described below.

## **I. Introduction**

Because the DOE minimum efficiency standards, which become mandatory in June 2014, are about equal to the ENERGY STAR Version 3.0 specification levels, EPA sought input on opportunities for further efficiency improvements to room air conditioners that could serve as the foundation for a revision to the ENERGY STAR room air conditioner specification. AHAM does not have a position on whether EPA should revise or sunset the room air conditioner specification. Nevertheless, we provide the comments that follow in response to the questions EPA posed. We expect that individual manufacturers will provide their comments on whether there are sufficient energy efficiency improvements that can be made or whether the specification should, instead, be sunset.

## **II. Efficiency Opportunities**

### **A. Improved Installation Practices**

EPA indicated that there appears to be a significant opportunity for energy savings derived from improvements to window room air conditioner installation practices. EPA cited a National Renewable Energy Lab (NREL) report which suggest that homeowners with existing room air conditioners remove the manufacturer-provided accordion panels and replace them with rigid foam boards and tape all potential air infiltration pathways. EPA sought input regarding the opportunity for energy savings as well as potential certification criteria that would differentiate room air conditioners that enable more energy efficient installation. EPA provided examples such as requiring that the manufacturer provide additional materials and instructions and/or modified product designs that facilitate more energy-efficient installation.

It appears that EPA is considering prescribing a more rigid material for installation. Such a requirement, however, could cause practical, consumer utility, and safety concerns. Consumers often want to be able to easily install and remove a room air conditioner, especially smaller BTU units. It is difficult or impossible to do that with a rigid or more permanent installation and thus, a strict requirement could decrease consumer utility of the product. Similarly, the current flexible accordion design employed by many manufacturers helps units fit into many different sized windows. A rigid material would not have that ability and could require a consumer to use a razor to cut the material, thus resulting in injury.

### **B. Component Improvements**

EPA sought feedback on potential efficiency improvements from higher-efficiency room air conditioner components, such as variable speed compressors, as well as the associated incremental costs associated with those components.

Though variable speed compressors could offer energy savings, such a component may not be feasible for room air conditioners due to the incremental cost. In addition, AHAM agrees that the current DOE test procedure would not show any benefits from using a variable speed compressor because it is not run at different temperatures. Moreover, the test burden to capture the benefits would be much higher (perhaps as much as 6 times higher) because it would require

additional testing—that burden would likely outweigh any benefit in terms of efficiency gains and may not result in payback for the consumer in a reasonable time.

### C. Reducing Evaporator Recirculation

EPA cited an NREL report which showed that evaporator air recirculation can reduce energy efficiency of installed products by as much as ten percent. “Modified product designs, such as inverting the interior components (locating the evaporator supply at the bottom of the unit) and/or supplying an attachment fin to separate the supply and return airflows, were suggested by NREL as options for reducing the amount of conditioned air that is drawn-in and recirculated over the evaporator coil.” EPA sought feedback on the design modifications suggested by NREL as well as NREL’s conclusions regarding energy savings potential.

AHAM believes that some or even most manufacturers already consider the effect of air recirculation when designing products to meet the ENERGY STAR requirements and take steps to prevent it with the position and shape of the louvers.

Manufacturers have tested room air conditioner units both under the calorimeter method in the DOE test procedure as well as the psychometric (ducted) test in ASHRAE 57. Those tests have produced the same data. The psychometric method isolates the outgoing airflow completely in a duct—thus, providing no opportunity for recirculation. Thus, the fact that those test results are comparable to the DOE test procedure results, suggests that there would not be significant (or perhaps any) efficiency gains from reducing evaporator recirculation.

### D. New Refrigerants

EPA sought information on the potential savings associated with room air conditioners that use lower global warming potential (GWP) refrigerants. In particular, EPA sought additional energy efficiency data as well as information on the status of addressing safety considerations, technical challenges, and performance considerations.

AHAM notes that refrigerants in room air conditioners are very different than those in refrigerator/freezers—the charge amounts in room air conditioners are much higher. Safety issues are different, and the refrigerant heat transfer dynamics are different. Thus, the low GWP alternative refrigerants, such as hydrocarbons or HFOs, that exist for refrigeration products may not be feasible for room air conditioners. Underwriters Laboratory is looking at this issue from a safety perspective and could place restrictions on charge size. Until that review is complete, hydrocarbons cannot be used. It is possible that the necessary charge to operate most room air conditioners may not fit within that range, depending on the UL determination. In addition, significant technical and economic challenges remain. Accordingly, AHAM does not believe that there are low GWP alternatives available that are economically justified at this time.

Furthermore, as we have commented in the past, EPA must not stray from its strategic vision for the ENERGY STAR program, which is to reduce greenhouse gas emissions by removing barriers in the market that deter consumers and others from purchasing the most energy-efficient product

model that otherwise meets their needs. The ENERGY STAR program must remain squarely focused on energy efficiency and not create design requirements.

### **III. Connected Functionality**

EPA has identified its intent to help advance the market for products with intelligent features in ways that deliver immediate consumer benefit as well as support a low-carbon electricity grid over the long-term. AHAM supports EPA's decision to incorporate smart grid functionality and to provide a 5% allowance consistent with the "Joint Petition to ENERGY STAR to Adopt Joint Stakeholder Agreement as it Relates to Smart Appliances" from industry, efficiency advocates, and environmental groups. The allowance is intended to serve as an incentive to help jump start the market for room air conditioners with smart grid functionality.

In the Section "Connected Functionality," EPA states it plans to incorporate optional connected criteria, including an allowance (for products certified using a TBD ENERGY STAR test method for demand response), in a Version 4.0 specification and EPA would tailor key elements to capture the energy management, consumer convenience/control, and load control opportunities unique to room ACs. Although AHAM agrees that consumer convenience is a priority, AHAM has concerns with the elements identified as "load control opportunities". As specified in AHAM's White Paper "The Home Appliance Industry's Principles & Requirements for Achieving a Widely Accepted Smart Grid", in all cases, the smart appliance will retain control of the appliance response to a signal from a utility company. In addition, consumers will also need to retain their ability to override any signal sent by a utility. Utilities do not have expertise in the use and operation of appliances. AHAM maintains that the purpose of the Smart Grid is to provide a more efficient use of energy, not for utilities to control or monitor appliance usage and therefore load control should not be a requirement of the specification development.

### **IV. Portable Air Conditioners**

EPA sought feedback to assess the efficiency opportunity associated with expanding the ENERGY STAR program in the future to include portable air conditioners once a DOE or ENERGY STAR test procedure is available. EPA anticipates that this effort would be a "follow-up effort to a Version 4.0 specification development process." It appears that EPA would consider including portable air conditioners under the room air conditioner ENERGY STAR specification.

AHAM supports EPA developing an ENERGY STAR program for portable air conditioners. EPA need not wait, however, for DOE to develop a test procedure. In fact, as we commented to DOE in response to their proposal to cover portable air conditioners under EPCA, there is a test procedure that DOE can easily incorporate by reference if and when it develops a test procedure. And, in the interim, we would support DOE and EPA relying on that procedure for an ENERGY STAR program. (Should DOE adopt a test procedure, however, EPA must ensure that the ENERGY STAR specification cites to that test procedure). The Canadian Standards Association (CSA) has a test procedure for portable air conditioners. AHAM's PAC-1 is almost identical to that procedure and we are nearing completion of a revised version of PAC-1 that will be fully harmonized with the CSA test procedure. We are close to balloting that revision and then will

need to go through the ANSI approval process. Upon completion, we will gladly provide the revised PAC-1 to DOE and EPA. Regardless, AHAM strongly urges DOE and EPA to work closely with NRCan and CSA in order to ensure that the ENERGY STAR and Canadian test procedures for portable air conditioners are harmonized. The market for major appliances, including portable air conditioners, is an integrated North American market and thus, it is critical that the test procedures be the same.

Should EPA develop an ENERGY STAR program for portable air conditioners, AHAM believes it should be a specification separate from the room air conditioner specification. Although consumers may compare portable and room air conditioners to each other, the products are different and have different needs in terms of energy efficiency thresholds and testing. For example, portable air conditioners have several configurations (some are single duct while others are dual and there are different venting configurations, for example). The CSA and AHAM portable air conditioner test procedures are different from the DOE room air conditioner test procedure, but would still permit consumers to compare the ratings even if ENERGY STAR has separate specifications.

AHAM proposes that, should EPA develop a portable air conditioner ENERGY STAR specification, it be effective in October 2014 for the 2015 cooling season. Because EPA's specification development process must transparently evaluate the necessary data to determine appropriate energy efficiency criteria according to EPA's guiding principles, we urge EPA to quickly begin the specification development process and engage stakeholders.

AHAM appreciates the opportunity to submit comments on the ENERGY STAR Room Air Conditioner Framework Document and would be glad to further discuss these matters should you so request.

Best Regards,

A handwritten signature in cursive script that reads "Jennifer Cleary".

Jennifer Cleary  
Director, Regulatory Affairs