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

OFFICE OF
AIR AND RADIATION

June 09, 2014

Dear ENERGY STAR® HVAC Partner and Stakeholders:

In anticipation of the development of ENERGY STAR Most Efficient 2015 requirements later this year, EPA is engaging with stakeholders now to begin work on revising the system status and messaging requirements for HVAC products. Recognizing the complexity of these criteria and the evolution of the market in the last year, EPA sees value in engaging with stakeholders prior to the release of ENERGY STAR Most Efficient 2015 proposals. Stakeholders are welcome to provide comments on this preliminary proposal no later than July 7, 2014.

2015 Proposed System Status and Messaging Requirements for ducted and ductless CAC/ASHP, Furnaces, and GHPs

Currently, ENERGY STAR partners that wish to have CAC/ASHP, furnaces and GHP products recognized as ENERGY STAR Most Efficient 2014 must meet system status and messaging requirements in addition to the efficiency performance criteria. EPA is seeking to make these requirements more specific and more closely tied to energy savings. The requirements outlined below are based on what EPA has learned about advanced HVAC equipment over the past few years implementing the ENERGY STAR Most Efficient program. The Agency anticipates these more specific requirements would increase clarity and address stakeholder feedback about delays in evaluating applications.
Because many of the issues these proposed requirements address are relevant to ductless units, EPA proposes that most of them apply to ductless units as well.

For the ENERGY STAR Most Efficient 2015, EPA proposes that CAC/ASHPs, Furnaces and GHPs must have automatic setup, monitoring, and message capabilities as specified below:

<u>Automatic Setup Requirements</u>

- **Unit Setup Information**: Units shall be capable of transmitting setup information to at least one controller on the market, including capacity, stages of cooling and heating and default air flow requirements. The controller may be a thermostat or an on-board controller designed to coordinate operation of an entire HVAC system.

To ensure that the HVAC system is installed correctly and delivers the designed performance, EPA proposes that units be capable of transmitting setup information to at least one controller on the market. This includes capacity, the number of stages of cooling and heating, and default air flow for each stage. Traditionally, thermostats have been the controllers of HVAC systems, but EPA understands that for many of the most advanced and efficient systems available today, control functions are now provided by onboard circuitry. The language of this (and other

requirements) is intended to allow manufacturers flexibility in this regard. Stakeholders are encouraged to comment on the setup information that is most important to transmit automatically, in order to prevent errors in setup. Stakeholders are also encouraged to comment on other system capabilities, similar to the above, that are important to prevent setup errors.

Monitoring Requirements

- **Static Pressure**: Ducted units which include a blower fan will provide a signal that can be used to estimate the static pressure across the fan.

The static pressure across the blower fan can signal the need for service or for the filter to be changed. Addressing these issues promptly maintains the efficiency of the system as installed. The modulating fans used to achieve the high SEER requirements of ENERGY STAR Most Efficient recognition have a control loop that should make it relatively easy to detect changes in static pressure. This requirement is not relevant for ductless units.

- **Refrigerant Charge**: Units shall be capable of transmitting signals from which errors in refrigerant charge may be estimated, such as subcool or superheat, to at least one controller on the market. The controller may be a thermostat or an on-board controller designed to coordinate operation of an entire HVAC system.

A system with an undercharged or overcharged refrigerant uses more energy than it is designed to use, and may not deliver the expected heating and cooling service. EPA understands that monitoring subcool is an excellent way to ensure the refrigerant charge level in a system is right, but sees no need to insist on a particular method.

- **Fault History**: Service personnel shall be able to access a log displaying fault history in plain text. The product may enable access through any mechanism, for example: 1) a text-based display (e.g. LED) permanently incorporated into the unit, 2) at least one thermostat available on the market, 3) a diagnostic tool available on the market which can be brought to the work site by the service personnel. Other equivalent mechanisms are also acceptable.

EPA's discussions with contractors revealed that complete and easy to understand fault code histories were key to fast, accurate servicing of equipment. This is intended for service personnel, not homeowners, which is reflected in the options for its access. The list of options provided here are examples only, and EPA welcomes other strategies that provide similar service.

Message Requirements

- **Resident Alerts in Plain Text**: Units shall facilitate display, in plain text, of messages to residents. This will include, at minimum, that the air filter needs changing, and that the unit needs professional service. This may be through display on the thermostat or other control device in occupied space in the home, or through any other system that can reach residents directly. Displays on a unit inside a closet, basement or attic, or outside of conditioned space, will not be sufficient.

Messages displayed in plain text rather than blinking lights or error codes are easier for the occupant to understand and are more likely to lead to prompt corrective action. EPA also requires that the display be located in occupied space in the home, easily accessible and visible to the homeowner. EPA is aware of stakeholders' suggestions to allow other methods of communication (e.g. text messages or emails) and would be amenable to the idea as long as they facilitate ease of communication with the owner of the HVAC device. These messages are intended to include only those maintenance actions that are recommended for homeowners to address themselves, such as a filter change or calling service personnel.

Stakeholders are encouraged to submit comments on all of these requirements, including whether the requirements and their specific wording reflect EPA's stated intent. We recognize that our manufacturing partners are the experts on these capabilities, and look forward to a robust and productive discussion.

EPA plans to hold a stakeholder meeting from 12:00 to 2:00 PM ET on June 24, 2014 to discuss this preliminary proposal for 2015 Most Efficient HVAC system status and messaging requirements in greater detail. If you'd like to participate, please register prior to the webinar here. Stakeholders are encouraged to submit comments on the proposed system status and messaging criteria to mostefficient@energystar.gov no later than July 7, 2014. EPA will consider feedback received on this initial proposal prior to releasing the ENERGY STAR Most Efficient 2015 HVAC proposals in July. EPA expects to finalize ENERGY STAR Most Efficient 2015 requirements in September 2014.

I look forward to working with you on the revision of these ENERGY STAR Most Efficient HVAC system status and messaging requirements.

Thank you for your support of the ENERGY STAR program.

Sincerely,

Abigail Daken
ENERGY STAR HVAC Product Manager