

EPA Most Efficient March 2011 Proposal for HVAC: Stakeholder Comments and EPA Responses

Comment	EPA Response
<p>The criteria would benefit from greater clarity regarding communication and diagnostics requirements. The criteria do not state if the communication has to be digital, if it needs to conform to a specific protocol and if other methods of communication also qualify, such as diagnostic codes that can be displayed by a thermostat or other device.</p>	<p>EPA will provide further clarity on the requirements for communications and diagnostics.</p>
<p>Can the EPA provide or identify resources that quantify The efficiency improvements expected by communicating commissioning and diagnostic information?</p>	<p>Several published studies have examined the efficiency difference between units as tested in the lab and as they work in the field. Poorly maintained systems can use 20% more energy than well maintained properly installed systems. The communication and diagnostic requirements we require are meant to mitigate these losses. As with all behavior change programs, it is difficult to predict their effect quantitatively. In addition, these requirements are synergistic with advanced control capabilities that are reported privately to save as much as 40% on cooling.</p>
<p>According to the AHRI directory, far less than 1% of central AC, air source heat pump and furnace products meet the proposed top tier requirements. Further, these limited products do not match each other, hindering the ability to put together an entire HVAC system. The range of available sizes does not include some commonly used ones, which could lead to the installation of over-sized or under-sized units. Specific recommendations for Furnaces levels included 97.5 AFUE, and 95 AFUE to match the Federal tax credits.</p>	<p>In recognition that the proposed Most Efficient levels would preclude forming a complete system controlled by a single intelligent thermostat, EPA has relaxed the levels for Central Air Conditioners, Air-Source Heat Pumps and Furnaces.</p> <p>One of the goals of the Most Efficient program is to highlight products with truly exceptional, leading edge efficiency. In light of this, EPA recognizes that the HVAC criteria may not be achievable in all configurations or by models in every size. However, EPA notes that this does not preclude consumers from choosing HVAC equipment that best meets their needs. The ENERGY STAR program recognizes products with superior efficiency in a wide range of configuration and sizes</p>
<p>GHPs should not be limited to less than 65,000 Btu/h of cooling. It is not uncommon for larger homes to employ water to air units above 65k BtuH and water to water units as large as 120k BtuH that employ a single phase power supply.</p>	<p>EPA agrees that as the ENERGY STAR GHP specification does not limit the size on GHPs, there is no reason for the Most Efficient program to do so. EPA will remove the size restriction from the GHP Most Efficient eligibility criteria.</p>

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<p>Require the same Top Tier levels for packaged and split Air-Conditioners and Air Source Heat Pumps, similar to the refrigerator proposal, where differences in the physical size or features does not differentiate the performance.</p> <p>Consider not including packaged AC for the following reasons: this equipment is not available with condensing furnace sections, so the winter performance is very poor. There is also a high potential for off-cycle losses and cabinet losses as the vertical supply and return ducts carry warm air from the living area into the unit, whose poor insulation <u>and uncertain sealing result in high thermal losses</u>.</p>	<p>In this pilot year, EPA will recognize package units, with eligibility requirements somewhat lower than for split systems, as proposed in the draft Criteria for Recognition. Should the program continue after this pilot year, we look forward to taking the opportunity to refine the criteria.</p>
<p>Most Efficient criteria should include a requirement for central AC and heat pumps to be equipped with variable speed air handler fans and <u>modulating compressors with at least 2-step operation</u>.</p>	<p>EPA understands that manufacturers use these features in any case to achieve the energy efficiency required for Most Efficient recognition.</p>
<p>Most Efficient criteria for central AC and heat pumps should include a requirement for units to be equipped with [...] humidistats; or alternatively demonstrate that they meet short-term event and seasonal needs in humid climates. Features and controls that enable outdoor air delivery for controlled ventilation should also be required. Also require "sealed combustion," which isolates the furnace from the space in <u>which it is installed</u>.</p>	<p>In the interests of launching and running the pilot for long enough to allow for evaluation, EPA will not implement these suggestions for this year. EPA is interested in learning more about them for future years should the program continue.</p>
<p>Require central AC and heat pumps to be equipped to [...] transmit trouble codes to dealers or factory.</p>	<p>EPA is concerned that this may be a privacy concern and therefore will not require it. However, with the required diagnostics and communications features, manufacturers could easily implement this <u>as a consumer option</u>.</p>
<p>The Furnace criteria specifies natural gas, propane and oil as the included fossil fuels but states that oil furnaces are not eligible for the most efficient recognition in 2011. EPA should address this <u>discrepancy in its criteria for residential furnaces</u>.</p>	<p>This is an error and EPA will correct it by removing oil from the list of fossil fuels.</p>
<p>Boilers should be included. Inclusion of furnaces and exclusion of boilers creates a bias between competing industries and also, boilers will lose out on rebate opportunities.</p>	<p>If the program goes well in this pilot year, EPA expects to include other products in the coming year and understands that boilers may deliver on stated program principles.</p>
<p>Do not regionalize GHPs, as these units are installation dependent for overall efficiency. Continued pushing for greater efficiencies will place undue burden on an industry that is significantly smaller in numbers than other products proposed for implementation of the Top Tier program.</p>	<p>EPA is not proposing regional performance criteria for the Most Efficient program at this time.</p>

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Top Tier program within the ENERGY STAR program runs the risk of moving the minimum requirements up. All manufacturers would again try to comply, and there would be no differentiation.	Given the intended role of the Most Efficient program in the market, EPA does not believe that the associated levels are likely to become minimum standards. Should the Most Efficient program continue, EPA will revisit the criteria for recognition annually.
Energy Star qualifications for the current Geothermal Heat Pump program need improvement in that AHRI ratings are only available at full load capacity. There is no rating standard for part load on two-stage or multi-stage units. Energy Star allows the part and full load ratings to be averaged to determine if a product meets Energy Star. Since there is no AHRI part load standard, there is no way to know if a manufacturer truly meets the Energy Star requirement because the <u>rating system is subjective</u> .	As this comment relates to the ENERGY STAR Geothermal Heat Pump specification, EPA will consider it the next time the specification is revised. EPA prefers to base ENERGY STAR requirements on industry-accepted test methods.
Require quality installation. For HVAC, Top Tier should include installer certification that the product installation has been performed in accordance with ACCA Quality Installation [QI] procedures.	EPA recognizes the importance of installation and maintenance to the performance of HVAC systems in the field. We welcome suggestions as to how to administer such a requirement, and will consider it for future years if an approach can be found.
The Most Efficient program would be more meaningful if it identified “systems” with the most energy efficient performance in the industry vs. other systems which provide the same service.	EPA recognizes that HVAC systems tuned for the climate and particular circumstances of the dwelling they serve will deliver the best efficiency. We welcome suggestions as to how to recognize these systems with a performance requirement on manufactured equipment, <u>for consideration in future years.</u>

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<p>Combining non-renewables with renewables puts renewable energy technologies on par with less efficient, non-renewable technologies and does not recognize that renewables are superior in efficiency to non-renewable products.</p> <p>Geothermal heat pumps are already the most energy efficiency system available to homeowners. [...] If a Most Efficient program were to be instituted, it would be more meaningful if it identified “systems” with the most energy efficient performance in the industry vs. other systems rather than comparing to like products which will always be comparable in performance</p>	<p>The ultimate measure of efficiency is energy consumed for service delivered. GHP systems are evaluated on the basis of the electricity they consume, not considering the renewable geothermal energy they consume, for delivering the service of space cooling. EPA believes this to be a fair comparison.</p> <p>In recognition of the generally higher performance of geothermal heat pumps, EPA has set levels for these products that include a large percentage of models on the market for consideration in future years.</p>