



ENERGY STAR[®] Programmable Thermostats

Draft 1 Version 2.0
Stakeholder Meeting
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Agenda



- Welcome & Introductions
- Drivers and Context for Draft 1 ENERGY STAR Programmable Thermostat Specification
- Draft 1 Version 2.0 Review
- Next Steps
- Q&A

Drivers and Context



- EPA recognizes a Programmable Thermostat's potential to deliver energy savings and will continue to educate Americans about using them properly.
- Until we can differentiate those programmable thermostats that routinely deliver energy savings, ENERGY STAR is not providing value, thus the current specification will sunset December 31, 2009.
- With the intention of developing a next generation ENERGY STAR specification as quickly as possible, EPA released for comment a Draft 1 Specification on October 29, 2009.
- This specification proposes requirements that EPA sees as a key step to fully realizing the energy-saving potential of programmable thermostats.

Drivers and Context (cont.)



- DOE is developing metrics or benchmarks that will allow more refined comparison of products' usability and EPA expects to use these tools in a next Tier of ENERGY STAR requirements.
- EPA does wish to work with stakeholders to refine the current proposal so that it delivers on its intention to ensure savings and deliver comfort. Any future ENERGY STAR requirements for these or similar products must deliver savings.
- EPA wishes to engage with stakeholders re: benefit of very near term implementation of the proposed Tier 1 vs sunseting on December 31, 2009 and allowing more time to transition to new requirements.

Key Draft 1, Version 2.0

Definitions



- New Definitions
 - Auxiliary Heat, Conventional HVAC, Heat Pump, Dual Fuel Heat Pump
 - Line Voltage Thermostat, Low Voltage Thermostat
 - Programmable Communicating Thermostat (PCT)
 - Home Area Network (HAN), Home Energy Management System
- Enhanced Definitions
 - Recovery System definition includes Conventional, Heat Pump and Pre-comfort recovery
 - Hold Features definition expanded to include Short & Long Term Hold features.

Key Draft 1, Version 2.0 Criteria



- Qualifying Product Requirements
 - Low voltage thermostats only
 - Three program modes minimum, 5-2 day (default) plus 5-1-1 day & 7 day
 - HVAC compatibility up to & including 3-stage heat / 2-stage cool plus humidity control
 - Proper support of Dual-Fuel systems
 - Field-upgradeable to PCT via HAN module installation

Key Draft 1, Version 2.0 Criteria (cont.)



- Usability Requirements
 - Single-click energy saving (“Away”) mode
 - Single-click raise/lower setpoint temperature
 - One or more “hold” modes, Short & Long-term hold modes recommended
 - Backlit display with timed power-down
 - Minimum font size for primary / secondary characters
 - Feedback to user to confirm changes to settings
 - Non-volatile memory to store schedules and settings
 - Capability of retrieving standard time signals
 - User selectable Fahrenheit or Celsius display

Key Draft 1, Version 2.0 Criteria (cont.)



- Technical Requirements
 - Maximum NEMA DC 3-2008 cycle rate of 5 per hour
 - Dual Fuel support including configurable, automatic cutover based on outdoor temperature
 - Energy saving default recovery systems
 - Humidity control
 - Maximum power consumption limits in various operational modes
 - Lead-free and mercury-RoHS compliance

Key Draft 1, Version 2.0 Criteria (cont.)



- Communication Requirements
 - PT shall be upgradeable with low-power, low-bandwidth HAN communication modules
 - Integrated logging and storage of usage data for use with energy management systems
 - Low-battery indicator (2-month notification)
- Documentation Requirements
 - Use of graphics and text for clear documentation, installation, and operating instructions
 - Electronic documentation available for at least 10 years after end of product manufacture cycle

Key Draft 1, Version 2.0 Criteria (cont.)



- Ease of Installation Requirements
 - Compliance with NEMA DC 3-2008 HVAC wiring terminal designations
 - Features to facilitate “no-new-wires” installation in retrofit application
 - Use common batteries free of special handling and/or hazardous waste disposal requirements (18 month battery life encouraged)

Tier 1 Next Steps

- Stakeholder comments due on Draft 1 by November 27
- EPA to refine Draft 1 through stakeholder process
 - 1-2 additional drafts with comment periods
 - Depending on timing and availability of usability metric, EPA may work with stakeholders on a program that merges currently articulated Tiers 1 and 2.

Tier 2 & Future Efforts



- Under Tier 2, EPA is proposing to include verification testing requirements similar to those for ENERGY STAR Residential Ventilating Fans
- EPA will work with stakeholders to refine requirements such as:
 - Products to be certified by third party certification org
 - Test lab accreditation to ISO/IEC 17025
 - Verification test procedures in place for certification org
 - Challenge procedure requirements in place for certification org

Tier 2 & Future Efforts (cont.)



- Conduct field studies on energy use and usability
- Contribute to DOE development of metrics or benchmarks to quantify and evaluate usability
- Develop ENERGY STAR program requirements that leverage this work
- EPA to consider establishing a new comfort controls category as an alternative to the narrower category of thermostats.

Tier 2 Milestones



- DOE recently launched research to increase the usability of residential thermostats
- EPA believes that this research will contribute to more robust definitions of usability
- EPA and DOE are coordinating so that research results will be useful input to future Energy Star specifications
- EPA urges stakeholders—especially thermostat manufacturers—to collaborate with DOE researchers to ensure highest quality and most relevant research

Version 2.0 Stakeholder Discussion Points



Overarching

- EPA intends for this specification to differentiate products that deliver savings by being superior when it comes to energy saving, usability, communication, and delivering on other consumer interests, all while offering comfort. Is this goal met? If not, what revisions are desired?
- Do stakeholders see benefit in near term implementation of the Tier 1 requirements vs sunseting the program on Dec 31 and giving more time to work on and transition to new requirements?

Definitions

- Are new definitions appropriate and accurate?

Qualification

- With these requirements has EPA excluded any products that deliver on the stated goals? Can EPA go further to ensure only top performing products can qualify (based on ability to meet goals)?

Version 2.0 Stakeholder Discussion Points



Usability

- Are the included usability criteria the right ones to differentiate the most easy to use products? Are there others?
- What time delay should be used for display backlight power-down?

Technical

- Are there other technical requirements that deliver on the program goals that EPA should consider?
- Are NEMA DC 3-2008 requirements for temperature differential and maximum cycle rate reasonable, achievable and sufficient?
- What feedback do you have regarding proposed humidity requirements?
- What are reasonable limits for power consumption in various operational modes?

Version 2.0 Stakeholder Discussion Points



Technical (cont.)

- How should ENERGY STAR address continuous mechanical ventilation?
- Where is the PT market on bringing lead-free, reduced mercury products in the US?

Communication

- The PCT communication upgradeability are seen as a initial step towards communication giving consumers choice now and the ability to upgrade their current product as communication evolves. What comments and questions do stakeholders have?

Documentation

- How can ENERGY STAR address customer service concerns?

Ease of Installation

- Does these criteria reflect an easy to install product?
- Are these features important to consumers?

Other Comments/Questions?

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Thank you