ENERGY STAR®
Residential Climate Controls

Draft 1 Version 1.0
Stakeholder Meeting
April 19, 2010

Abigail Daken, U.S. EPA
Doug Frazee, ICF International

Webinar Goals

1. Present the drivers and long term vision for this new product category.
2. Focus on key changes, rather than all changes.
3. Solicit stakeholder feedback on key requirements.
4. Allow stakeholders to address areas of confusion and concern, and to suggest changes.

Agenda

- Drivers and context
- Draft 1 Version 1.0 specification review
- Effect of enhanced testing requirements
- Next steps and development schedule
- Q&A

Q 0: Throughout the presentation, questions on which EPA would particularly like stakeholder feedback will be highlighted in this format. Please refer to the question number in your written comments.

Drivers and Context

- EPA recognizes the potential for Residential Climate Controls to deliver energy savings through:
  - optimal control of HVAC equipment
  - increased use of programmed and manual setbacks – usability is key
  - improved customer visibility into how they are spending their energy dollars and how they can spend less
  - novel services and capabilities enabled by communication outside the HVAC system

Drivers and Context (cont.)

- The ENERGY STAR Residential Climate Control specification includes the following differentiating features from historic programmable thermostat requirements:
  - enhanced usability, including “Away” mode
  - outdoor temperature data access
  - display and control of humidity
  - upgradeable to a communicating climate control
- EPA will work with stakeholders to refine the current draft so that labeled products deliver user comfort while providing increased energy savings.

Climate Controls vs. PTs

Feature	Programmable Thermostat	Residential Climate Control
Controls Low Voltage HVAC	X	X
Controls Line Voltage HVAC	X	X
Configurable schedule	X	X
Outside Temperature Data		X
Humidity Control		X
Away Mode		X
Pricing Indication		X
Networkable & Remote Controllable		X
Participate in AMI/Demand Response Programs		X

Qualifying Products

- Low-Voltage and Line-Voltage Climate Controls may qualify
- Residential Climate Controls only
- Communicating Climate Control *or* end-user upgradeable to a Communicating Climate Control

Key Elements

- Many elements of the Draft 1 Version 2.0 Programmable Thermostat spec are included, with consideration of Stakeholder comments

- Communications
- Usability
- Advanced HVAC control
- Ease of Installation

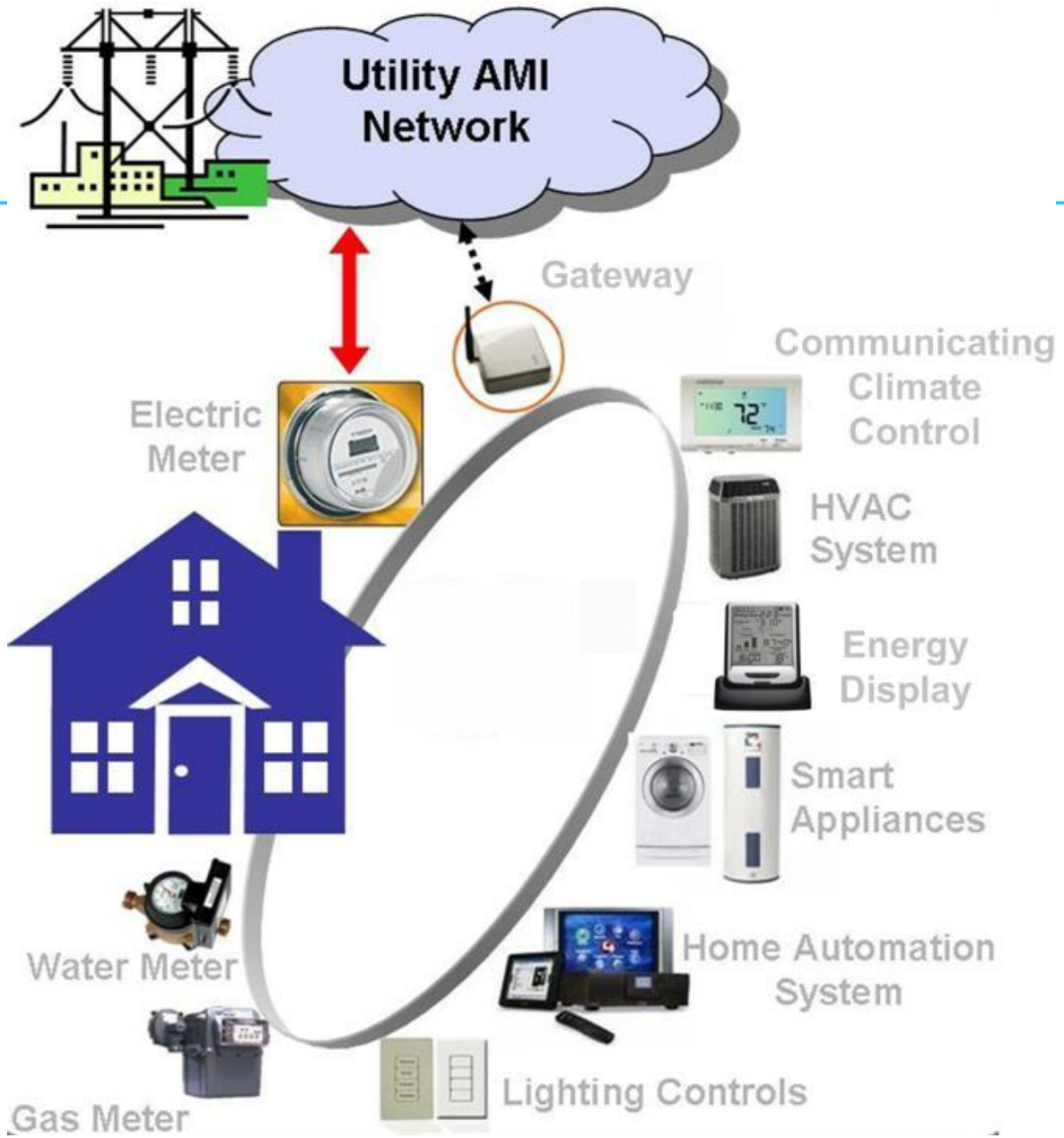
Communications

- New Definitions
  - Communicating Climate Control
  - Energy Management System (EMS)
  - Energy Services Interface (ESI)
  - Advanced Metering Infrastructure (AMI)
  - Demand Response (DR)

Communications (cont.)

- New Definitions (cont.)
  - Time of Use (TOU)
    - Off-Peak
    - Mid-Peak
    - On Peak
  - Open Standard

Q 1: EPA welcomes input on definitions. Are relevant definitions missed? Can wording be improved?.



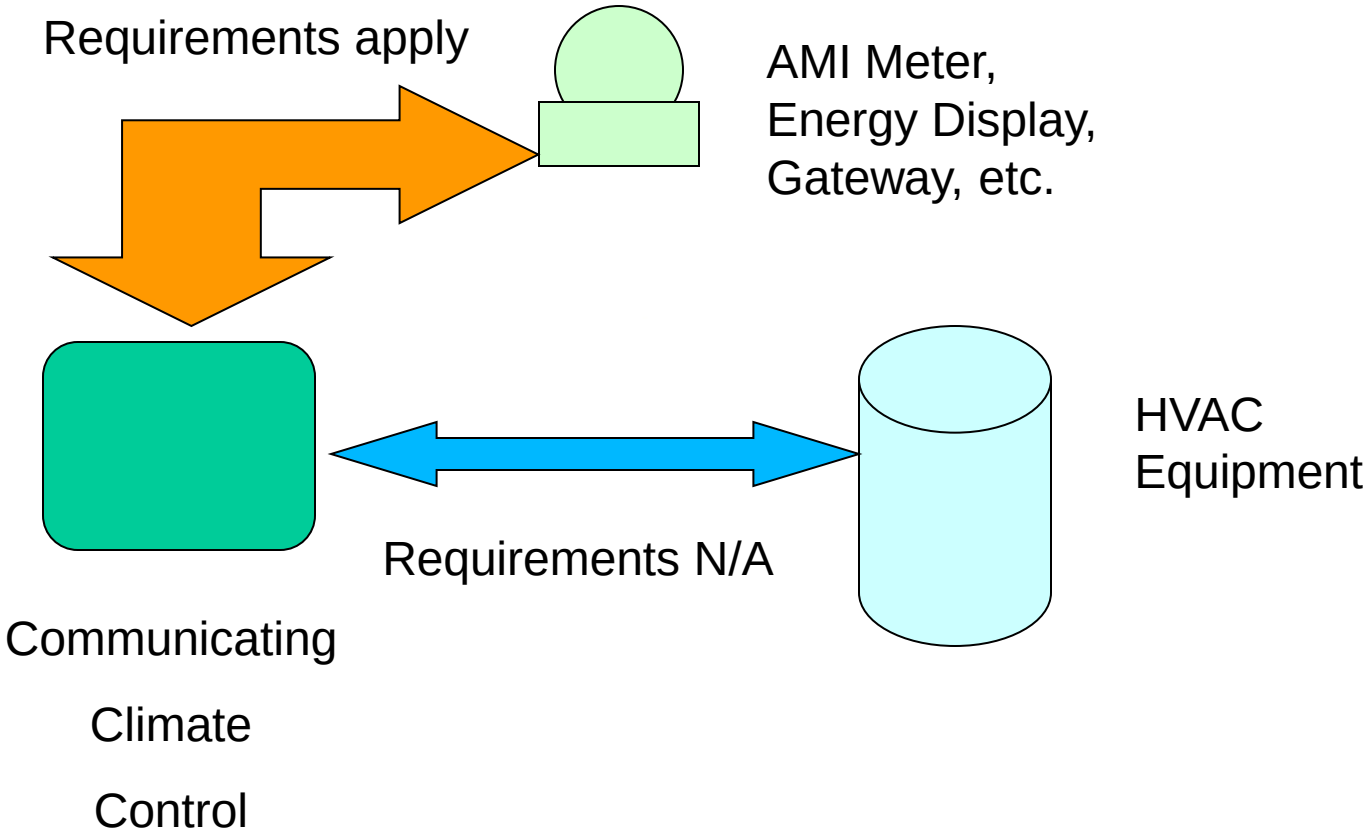
Source: digitalhomedesignline.com

Communications (cont.)

- 3rd party open access to all communication and remote control capabilities
- Must use suitable open communications standards, when they exist
- Requirements are applicable to all Qualified ClimateControls for communication with devices external to the HVAC system, only

Q 2: EPA requests comment on requirements for 3rd party access and use of open standards for communications. Are there alternate paths to achieve these goals?

Communications (cont.)



Communications (cont.)

- Communication security to allow only authorized access
- 60-second Climate Control data availability – transmitted at least every 5-minutes
- Near-real time response to remote control commands

Q 3: EPA welcomes input on data frequency, data transmission and remote control response. Are requirements reasonable? What system level throughput is being achieved in utility implementations?

Usability – Two Compliance Paths

Core requirements
- prescriptive
- standard terminology
- standard controls
- all ENERGY STAR climate controls must conform

Path 1

Performance Test
- task-based, non-prescriptive
- user panel test
- normalize by comparison with low-cost device
- allows manufacturer design flexibility
- encourages creative design

Path 2

Secondary Requirements
- prescriptive
- allows low-cost compliance path
- functionality parallel to performance test
- less flexible for manufacturers

Usability – Core Requirements

- Standardized “back-up heat” indicator
- Set and maintain date/time w/o user input
- Standardized default “Away” Heat & Cool set points

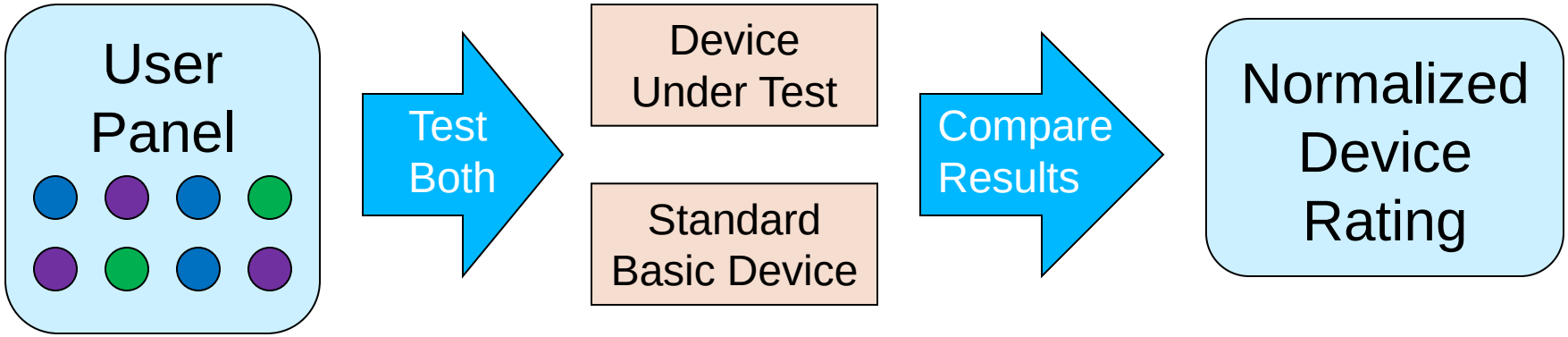
  62°F Heat / 85°F Cool

- Default “Away” set points may be changed but:

  65°F Heat, maximum

  80°F Cool, minimum

Usability – Performance Test



This comparison test is designed to derive an absolute device rating that allows fair comparison of devices tested by different panels.

Q 4: EPA welcomes advice on all aspects of test design, such as test concept, number of users, selection criteria for user panel, etc.

Usability – Performance Test (cont.)

Proposed Tasks

- Initial setup
- Establish constant temperature
- Establish a day/night schedule
- Establish a 5/2 schedule
- Activate Away mode
- Cancel Away mode & restore program control
- Recognize active modes and parameters

Q 5: Are these tasks reasonable? Are there others we should use in addition or instead? How many tasks?

Usability – Secondary Requirements

- Single operation to activate “Away” mode
- Green – Yellow – Red LEDs, or equivalent, capable of providing at a glance TOU price tier indication
- Single operation temperature adjustment
- Font size

Q 6: EPA welcomes recommendations for an appropriate readability test or standard to replace the font size requirement.

Q 7: Are these appropriate requirements? Are there others?

Advanced HVAC Control

- Recovery definitions harmonized with NEMA DC3-2008
- Recovery, adaptive as default
- For heat pump control default recovery must meet the requirements for recovery, adaptive AND recovery, heat pump with auxiliary heat

Q 8: EPA welcomes input on the default recovery requirement. Will adaptive recovery enhance user comfort, reduce overrides and auxiliary heat use, or will it confuse users?

Advanced HVAC Control (cont.)

- ±1°F operating differential
- Humidity sensing and display with minimum accuracy of ±3%
- 0.5w maximum power consumption in any operational mode
- Default schedule periods renamed to: Morning, Day, Evening, Night
- Default Night Cool setpoint relaxed to ≥ 78°F

Q 9: EPA welcomes input on humidity control and accuracy. Are requirements reasonable? Should independent temperature & humidity control be considered?

Ease of Installation

- Written installation instructions are required; written user instructions are no longer required.
- Residential use, only – specific labeling required on packaging and instructions.
- Exemptions to NEMA DC3-2008 terminal markings for Line Voltage Climate Controls and Low Voltage Climate Controls that use serial data links for direct HVAC control
- Minimum battery life requirement shortened from 18 to 12-months

Enhanced Testing Requirements

- Enhanced qualification and verification testing requirements across ENERGY STAR program – not unique to Climate Controls.
- Requirements will alter only the partner commitments section (as noted in the draft), not the technical requirements.

www.energystar.gov/testingandverification

- Test reports from EPA-approved, accredited labs will be reviewed prior to product qualification
- Verification testing will assure that qualified products continue to meet ENERGY STAR specifications through third-party testing of products acquired from distribution channels

Next steps

- Two more draft specifications, with comment periods
- Two additional stakeholder webinars, and
- Release to stakeholders of the draft usability metric, prior to final release
- The ENERGY STAR Residential Climate Controls Specification will go into effect upon the release of the final specification.
- Planned release date is October 1, 2010.

Schedule

- 3-31-2010 Draft 1 Version 1.0 Residential Climate Controls specification
- 4-19-2010 Stakeholder webinar
- 4-30-2010 Stakeholder comments due
- May 2010 Draft 2 specification
- June 2010 Stakeholder webinar
- July 2010 Draft usability metric
- August 2010 Stakeholder webinar
- September 2010 Final draft specification
- October 2010 Final Version 1.0 Residential Climate Controls specification

Contact Information

Abigail Daken
ENERGY STAR Program
202-343-9375
daken.abigail@epa.gov

Douglas Frazee
ICF International
410-279-1093
dfrazee@icfi.com

Alan Meier
Lawrence Berkeley National Laboratory
510-486-4740
akmeier@lbl.gov

Thank you