



# Residential Climate Controls Usability Test Method

Stakeholder Meeting

December 14, 2010

Washington, DC



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# Agenda

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- 9:00 am Welcome, introductions, review agenda
- 9:15 PT Usability Research (Alan Meier)
- 9:45 Test Method and Metric (Doug Frazee)  
Focus: test structure, metric, number and nature of tasks
- 11:45 Lunch
- 12:45 Stakeholder Presentation (ADT)
- 1:15 pm Repeatability: plans, panel design, and the reference device (Abigail Daken)  
Focus: panel design, reference device options
- 2:45 Reconvene, next steps for Climate Controls
- 3:30 Adjourn



# Why Concentrate on Usability?

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- EPA sunset labeling of programmable thermostats
- people who program = people who setback anyway
- Usability identified as a key barrier
- Energy and savings potential remains high – half of residential energy used for heating/cooling
- Performance based test (non prescriptive) key to fostering innovation



# Repeatability: Context

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**A good rating test will:**

- ✓ Differentiate devices
- ☐ Be **repeatable**
- ☐ Relate to real world performance

Be as simple as possible

# Repeatability

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- Check repeatability
- Test design for repeatability
  - Option 1: No reference device
  - Option 2: Physical reference device(s)
  - Option 3: Virtual reference
- Small group discussions (incl. phone)
- Polling



# Test Design for Repeatability

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- User panel tests repeatable in general?
- Comparatively, yes – but for an absolute score?
- Original concept: Reference device tested alongside unit under test each time the test is run (comparative test)
- Reference device is intended to “calibrate” different user panels and enhance repeatability
- Proposal of a reference device controversial
  - Concern: choice of device would bias the test
  - Concern: designation as a reference device would give market advantage

# Gold Standard vs. Brass Standard

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- Gold standard: best available
- Brass standard: does the job, not expected to be the best
- All the test requires is differentiation.
- Could have a gold standard reference for some tasks and a brass standard reference for others

# Repeatability Option 1: No reference

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- Use a large panel
- Specify composition tightly
  - Age
  - Gender
  - Color vision deficiency
- Harder to gather the panel and more costly.
- Repeatability yet to be confirmed





# Round Robin to Test the Test

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- Intended to test the test, not a device
- Run method on three specific devices
  - On the market now, widely varying designs - suggestions?
  - Abridge test as needed if some functions not present.
- At least three labs are needed.
  - Any source of additional data is welcome.
- Feedback on the test method in general



# Option to Add a Reference Device

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- In the long run, EPA intends to revise the test to include a reference
- Having a reference device will result in a more robust, repeatable test method.
- May allow smaller, easier to assemble panels
- Options for a reference device
  - Option 2: Physical reference device
  - Option 3: Virtual reference device

# Repeatability Option 2: Physical Device(s)

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- Use existing off the shelf devices as references
- No single device has all functions, so various products as references for various tasks
- Allows use of devices from various manufacturers, etc.
- For some tasks, no existing product has function, will need to create a “fake” reference
- Would not want to use a potentially labeled device as reference – no differentiation!
- Panel members end up using many devices in course of test

# Repeatability Option 3: Virtual Reference

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- Generic climate control hosted by a small, wall-mountable touch screen device
- No relationship to any actual climate control product
- Panel members use exactly two devices in course of test
- Easy to customize to provide all needed features
- Developed by ENERGY STAR/DOE (Option 3a) or by industry (Option 3b)



# Issues for Virtual Reference

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- Could be a gold standard or a brass standard. Do we have an opinion of which to aim for?
- Who will own the IP?
- EPA favors public domain IP. Does this favor DOE developing it? Could an industry consortium develop it?
- EPA's intention is to pursue developing a virtual reference unless an industry consensus alternative develops by 2012.



# Breakout instructions

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- 5-6 people per group
- On phone: will have moderator
- Will present focus questions
- Also answer poll (on line or physical paper) – we'll let you know when
- Reconvene and share insights, questions, opinions.

# Focus Questions

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- Is the panel too small, too large or just right?
- Is the panel specified too tightly? Are we missing anything?
- Which reference device option is best?



# Panel and Reference Poll Results

## Panel size

Too large 3

Just right 9

Too small 6

## Panel specified too tightly?

No 9

Yes 9

## Does the panel cover necessary demographic divisions?

Yes 6

No 12

## Preferred reference option

Option 1: No Reference 4

Option 3a: Virtual ref,  
DOE 9

Option 2: Physical dev(s) 0

Option 3b: Virtual ref,  
industry 0



# Climate Control Specification Timeline



- 1-30-2011 Draft Usability Test comments due
- February 2011 Draft 3, with usability metric and enhanced testing
- April 2011 Final draft specification
- May 2011 Final Version 1.0 Residential Climate Controls specification
- May 2011 Specification effective

# Contact information

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- Participate in round robin testing
- Comment on the Draft Test Method and metric

**Thanks for coming!**