ENERGY STAR® Smart Thermostats

Welcome & Update

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What do we mean by smart thermostat?

in the home

Thermostat
Two-way comms
Maintain comfort
Control HVAC Equip.

in the cloud

Network device
Occupancy detection & automated HVAC control
Demand response
Operational status reporting
Data collection for savings
Consumer feedback

Connected thermostat boundary

Consumer Remote Access
Participation in 3rd party (e.g. utility) services

Operational status reporting
Data collection for savings
Consumer feedback

Demand response
Occupational status reporting
Data collection for savings
Consumer feedback
The Service and its Energy Use

- Fundamental service: HVAC systems control for comfort
  - Use the least energy to do so, by the way
  - And make it convenient
- *Large* savings potential
- How to measure energy saved?
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  – Lab test
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  - Lab test
  - Rely on features (programmability)
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• How to measure energy saved?
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  – Rely on features (programmability)
  – Providers now HAVE DATA reflecting user choices and interactions!
Hardware + Service is the ENERGY STAR product
Service Provider is the ENERGY STAR Partner

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- Control HVAC Equip.
- Occupancy detection & automated HVAC control
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Cloud service

in the home
Earning the ENERGY STAR

1. Thermostat device passes basic tests

2. Thermostat product demonstrates basic capability

3. Demonstrate field savings using EPA software tools to analyze and aggregate data from hundreds of US homes

Heating savings

Cooling savings
Metric For Each Home

Thermostat setup (wiring, location)

History of use (set temps)

History of results of use (indoor temps, run times)

Publicly available data (outside temps)

EPA software tools

Quality of results

Climate zone

% run time reduction

Thermal characteristics
For Sample of Hundreds of Homes

- Cold/Very Cold
- Marine savings
- Mixed Humid
- Hot Dry/Mixed Dry
- Hot Humid savings
- Weighted average National savings
- Statistical information: deciles, standard error of the mean, etc.

Figure 1. Seven of the eight US climate zones recognized by Building America occur in the continental United States. A ninth zone, US climate zone 6, is shown in the annex.
Advantages of ENERGY STAR approach

• Not HOW energy savings are achieved, just WHETHER they are
• Accommodates wide variety of products
• Can credit savings achieved through services
• Wide scope for innovation, including behavioral