ENERGY STAR® Computer Stakeholder Online Meeting

Version 5.0:
Draft 1

April 8, 2008

Meeting Agenda

I.   Welcome and Introductions

II.   Review of the Version 5.0 Draft 1 with Facilitated Discussion
    A.   Definitions and General Comments
    B.   Energy Efficiency Performance Assessment (EEPA)
    C.   Network Requirements and Power Management
    D.   Thin Clients
    E.   Workstations
    F.   Power Supplies
    G.   Desktop Derived Servers
    H.   Game Consoles

III.   Timeline and Summary of Action Items Taken from the Meeting

IV.   Path Forward for ENERGY STAR Verification Testing for Computers

V.   Adjourn

II. Review of the Version 5.0 Draft 1 with Facilitated Discussion

Note (from Draft 1) - EPA has changed the reference from Tier 2 to Version 5.0 to reflect the structural changes in desktop/notebook evaluation, in consideration of Thin Clients for the first time, and to align with EPA's past versioning conventions regarding tiered specifications.

Draft 1 Overview

- Draft 1 Version 5.0 forwarded to Stakeholders on February 22, 2008
  - **Energy Efficiency Performance Assessment (EEPA)** to evaluate Desktop, Integrated Computer, Notebook, and Tablet PC product categories
  - **Updated power management requirements -** Energy Efficient Ethernet and full network connectivity maintenance while in Sleep Mode
  - **Inclusion of Thin Clients** - operational mode evaluation, distinct from Desktop and Notebook product categories
  - **Workstations** - intent to work with the Standard Performance Evaluation Corporation (SPEC) to develop a benchmark for Workstations
  - **Power supply efficiency requirements** – internal levels align with Climate Savers Computing Initiative's Bronze levels in response to industry feedback; external levels align with ENERGY STAR EPS V2.0 (in Final Draft)
  - **Desktop Derived Servers** – operational mode evaluation; review of product category viability
  - **Game Consoles** – separated into an independent product category within the computer specification

A. Definitions and General Comments

- **Stakeholder Comment Overview**
  - Operational Mode Definitions
    - <u>Off Mode</u>: a stakeholder suggested alignment of the ENERGY STAR definition with revised version of IEC 62301
    - <u>Sleep Mode</u>: stakeholders suggested moving ACPI S4 to the sleep definition (it is currently located as an Off mode per IEEE 1621)
    - <u>Active State</u>:
      - The active state definition was added to Draft 1 to account for the additional scope of the EEPA
      - Stakeholders expressed confusion over the inclusion of idle state in active
      - S0 was suggested as a revision to the Idle definition
      - One additional suggestion was to allow components to power manage themselves in the active state

<u>Active</u>	<u>Non-Active</u>
- Working	- Sleep
- Idle	- Off

A. Definitions and General Comments

- Stakeholder Comment Overview
  - Change *Integrated Computer* terminology to *Integrated* <u>Desktop</u> *Computer* to avoid confusion with the notebook category
  - Greater definition of the separation of notebook computers (covered by the specification) and PDA/Handhelds (not covered by the specification
  - Modifications to test procedures to account for portable computers that rely heavily or solely on WiFi rather than Ethernet
  - *Enterprise Channels -> IT Managed*

B. Energy Efficiency Performance Assessment (EEPA)

Energy Efficiency Performance Assessment and Associated Levels: Table 1 below lists annual energy consumption requirements for Version 5.0. Annual energy consumption will be determined using the formula below:

$$E_{annual} = 8760 * (P_{off} * T_{off} + P_{sleep} * T_{sleep} + P_{idle} * T_{idle}) + E_{active} * N_{active}$$

where all P_x are power values in watts, all T_x are Time values in % of year, E_{active} is the energy above Idle measured when a computer runs the benchmark workload once (in kWh), and $N_{workload}$ is the number of times each year the workload is assumed to typically run.

Table 1: Annual Energy Consumption

Product Category	Maximum Annual Energy Consumption (kWh)
Desktops and Integrated Computers	TBD
Notebook and Tablet Computers	TBD

- Draft 1 included an initial structure for the EEPA
  - Annual energy consumption limit derived from measured modal power levels pared with time multipliers, plus active energy component from EEPA tool (BAPCo's EEcoMark®)
  - N_{active} coefficient to scale active usage of the system to an annual component
  - First coefficient was a typo – should be 8.76 to reflect kWh

B. Energy Efficiency Performance Assessment (EEPA)

- **Stakeholder Comment Overview**
  - Support for strong presence of Idle in the active mode calculation
  - Stakeholders requested detail on the proposed Capability Adders table
    - The existing ENERGY STAR Imaging specification has an adder table with similar structure to what is being proposed in Draft 1
    - Some capabilities that add functionality to a system but do not expressly add to performance score have been identified in the Ecma/BAPCo process

B. Energy Efficiency Performance Assessment (EEPA)

- Stakeholder Comment Overview
  - Further details on the workload for the EEPA and current progress:
    - BAPCo EEcoMark development is progressing on schedule
    - EEcoMark is up to Beta 5 and most workloads are generally complete
    - Two Workloads primarily comprised of representative tasks performed by typical users:
      - <u>Office Productivity</u>: Focuses on office worker oriented tasks (web browsing of sites with increasing complexity; Microsoft Word documents creation revision)
      - <u>Media Rich</u>: Focuses on consumer media consumption/creation tasks (MP3 encoding from CD, MP3 playback multitasked with other program operations)
    - Workload specifications will be available for stakeholder review by May
    - The ENERGY STAR development team will receive EEcoMark beta versions beginning in May

B. Energy Efficiency Performance Assessment (EEPA)

- Data collection
  - EPA is continuing to collect data based on Intel's UTrack and VIA's PCUsage tools
  - Stakeholders will be providing additional data in the next two weeks, after which EPA will analyze the data for incorporation into the Time coefficients in the E_{annual} calculation

C. Network Requirements and Power Management

Table 5: Power Management Requirements

Specification Requirement		Applicable to
Shipment Requirements		
Sleep Mode	Shipped with a Sleep mode which is set to activate within 30 minutes of user inactivity	Desktop Computers, Integrated Computers, Notebook Computers/Tablet PCs, Workstations, and Thin Clients
Display Sleep Mode	Shipped with the display's Sleep mode set to activate within 15 minutes of user inactivity	All Computers

- ## Stakeholder Comment Overview
    - General support for continued presence of default PM at shipment
    - Suggested modifications were mostly related to PM implementation in Thin Clients and Game Consoles

C. Network Requirements and Power Management

Table 5: Power Management Requirements

Specification Requirement		Applicable to
Network Requirements for Power Management		
Ethernet	All Ethernet network interfaces shall comply with IEEE 802.3az – "Energy Efficient Ethernet"	All Computers
Wake on LAN (WOL)	Computers shall have the ability to enable and disable WOL for Sleep mode	Desktop Computers, Integrated Computers, Notebook Computers/Tablet PCs, Workstations, Desktop-Derived Servers, and Thin Clients
	Computers must be shipped with Wake On LAN (WOL) enabled from the Sleep mode when operating on ac power (i.e. notebooks may automatically disable WOL when disconnected from the mains)	Computers *shipped through enterprise channels* of the following types: Desktop Computers, Integrated Computers, Notebook Computers/Tablet PCs, Workstations, Desktop-Derived Servers, and Thin Clients

- ## Stakeholder Comment Overview
  - Requests that EPA table the IEEE 802.3az standard until a future tier of the program since it is not likely to be finalized within the scope of Version 5.0
  - WOL from Off as a niche use not applicable in most system implementations

C. Network Requirements and Power Management

Table 5: Power Management Requirements

Specification Requirement		Applicable to
	Network Requirements for Power Management	
Network Connectivity	Computers must maintain full network connectivity while in Sleep mode, according to a platform-independent industry standard.	Desktop Computers, Integrated Computers, Notebook Computers/Tablet PCs, and Thin Clients. Applies only to systems in the categories above that are shipped through Enterprise Channels.
Wake Management	Computers shall be capable of both remote and scheduled wake events from Sleep mode. Manufacturers shall ensure, where the manufacturer has control (i.e., configured through hardware settings rather than software settings), that these settings can be managed centrally, as the client wishes, with tools provided by the manufacturer.	All Computers *shipped to Enterprise Channels*

- ## Stakeholder Comment Overview
    - ### Requests for further detail on the network connectivity requirement
        - EPA feels that a large and increasing number of PCs in IT managed environments are left on continuously for the purpose of retaining full network connectivity when they otherwise could be in low power modes

D. Thin Clients

- Stakeholder Comment Overview
  - General support for a separate Thin Clients (TC) product category
  - Request that EPA to investigate mobile TCs, the types of servers included under the proposed definition, and impacts of datacenter energy consumption on overall energy savings of TCs
  - Suggestion to establish categories to capture differences between TCs (integral storage, processing, graphics)

- Updates
  - A notification of test effort distributed on March 14, 2008
  - Data from this effort will be used to set levels or inform the structure of Draft 2 TC requirements
  - Manufacturers encouraged to join those already participating
  - **If interested in participating in a separate call to discuss testing and possible classifications, email Evan Haines (ehaines@icfi.com) by Friday, April 11, 2008.**

E. Workstations

- Stakeholder Comment Overview
  - General agreement with separate requirements for workstations, with specific suggestions that the workload capture both active and inactive modes of operation

- Updates
  - SPEC GWPG has agreed to produce a workload based benchmark. Available by May 29.
  - The Workload will combine some portions of the SPEC Viewperf 3D workloads with relevant workloads from non 3D based applications
  - The output of the benchmark would then be annualized with modal measurements

F. Power Supplies

- Stakeholder Comment Overview
  - Comments were divided between support of alignment with CSCI Bronze internal power supply efficiency levels and concerns over component requirements impacting overall energy savings
  - Concerns expressed about IPS availability for channel manufacturers and cost impact of the requirements
  - Suggestion of removal of PFC for low output IPS (<75W)
  - For External Power Supplies, stakeholders generally supportive of adoption of ENERGY STAR EPS V2.0 levels

F. Power Supplies

- Updates
  - Manufacturers are encouraged to provide cost and IPS availability information
  - CSCI has proposed a revised modified test sampling methodology for IPS based on mean of an expanded sample set
    - ENERGY STAR supports this change and welcomes stakeholder feedback before changing test methodology
    - Next step: EPA will circulate a summary of proposal to stakeholders this week, with a request for comment in 2 weeks
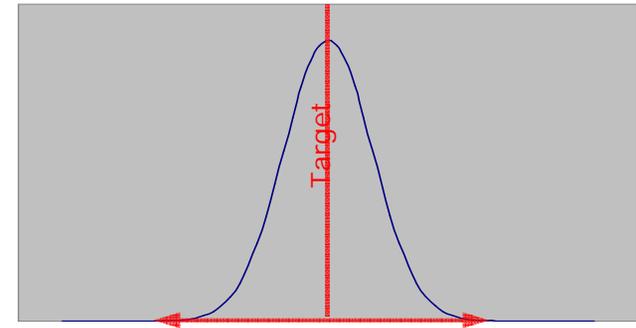
$Sample\ Size \geq 30$

$\overline{\eta}_{sample} \geq \eta_{target}$

$\sigma_{sample} \leq 1.0\%$

$If\ sample\ size\ N < 30, then:$

$\overline{\eta}_{sample} - (A\sigma - 0.380) \geq \eta_{target}$

$5 \leq N < 30$

G. Desktop Derived Servers

- **Stakeholder Comment Overview**
  - General agreement that definition revisions required
  - Interest in moving the DD Server Category to the ENERGY STAR Server specification (also in development)

- **Updates**
  - Stakeholder notification of test effort distributed on March 14, 2008
  - Data from this effort will be used to set levels or inform structure in Draft 2
  - Manufacturers encouraged to join those already participating

H. Game Consoles

- Updates
  - EPA has been working with Game Console manufacturers over the last 6 months on inclusion of requirements for this product category in Version 5.0
  - Based on their feedback, EPA will create and maintain definitions and test procedures more appropriate to Game Consoles
  - EPA is encouraged with the progress made to date. EPA continues conversations with GC manufacturers to find energy savings opportunities in current products and ways to implement energy saving features in future GC design generations

III. Timeline and Summary of Action Items Taken from the Meeting

Timeline

- <u>Mid April</u>: Draft 2
  - <u>Early May</u>: Draft 2 Comments due
  - *Tentative*: *In person stakeholder meeting*
- <u>Late May</u>: EPA comment response document
- <u>June</u>: data call; EEPA tool available and distributed
  - <u>Early to Mid July</u>: Data due (4-5 weeks)
- <u>Early August</u>: Distribute Draft 3 with levels
  - <u>Mid August</u>: In person stakeholder meeting
  - <u>Late August</u>: Comments due
- <u>Early September</u>: Distribute Draft 4; second revision of levels
  - <u>Mid to Late September</u>: Comments due
- <u>Early October</u>: Distribute Draft Final
  - <u>Mid October</u>: Comments due
- <u>Late October</u>: Distribute Final Version 5.0
- <u>July 2009</u>: Version 5.0 Specification goes into effect

IV. Path Forward for ENERGY STAR® Verification Testing for Computers

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April 8, 2008

Background and Purpose

- Through over 15 years of shared effort, EPA and our computer partners have built something of real value – the ENERGY STAR brand

- Maintaining the value of this brand requires ensuring products labeled with the ENERGY STAR deliver on their promise to the consumer

- This presentation intends to frame for initial discussion possible paths forward for computer verification testing

ENERGY STAR Value

- More than 1,700 manufacturers labeling more than 40,000 product models
- Over 900 retailers in US and Puerto Rico
- More than 500 utilities and other energy efficiency program sponsors promoting ENERGY STAR

ENERGY STAR Value

Awareness of ENERGY STAR

Legend: Unaided Awareness, Aided Awareness
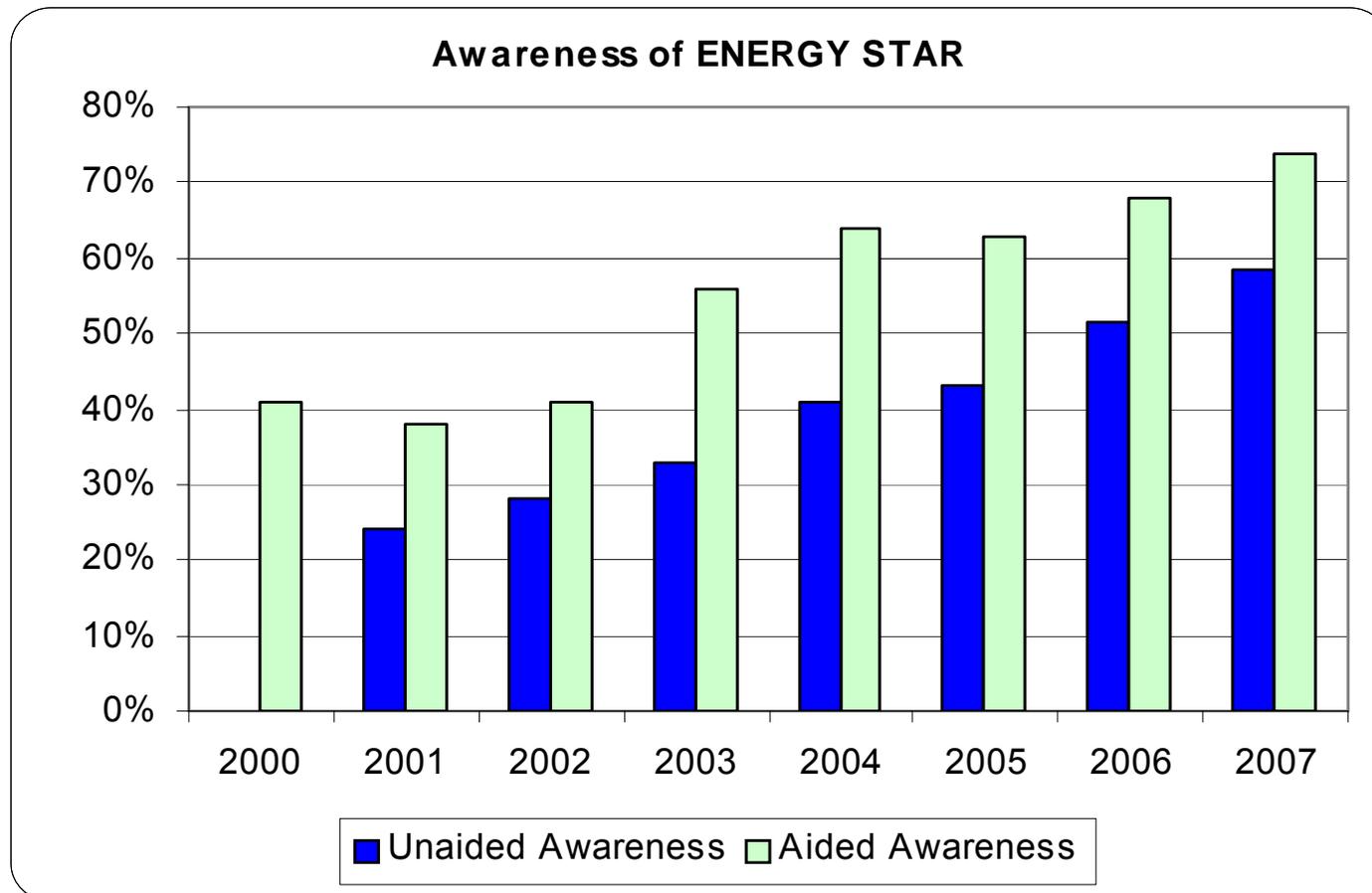
In 2007, more than 73% of households recognize the ENERGY STAR label at the national level.

ENERGY STAR Value

- ENERGY STAR supports its partners in advocating for international harmonization.

- Formal agreement with the European Union on ENERGY STAR for office equipment

- Arrangements re: ENERGY STAR for office equipment with:
  - Japan
  - Taiwan
  - Australia: also includes home electronics and others
  - New Zealand: also includes home electronics and others
  - Canada: also includes most other product categories

Maintaining the Value: Why Discuss Verification Testing Now?

- Increased scrutiny of voluntary programs
  - Proliferation of green standards – national, international, media, retail
  - Concern over "greenwashing"
  - OIG and GAO Reports

Maintaining the Value: Developing a Program-Wide Strategy

- Tailored approaches for product categories
- Goal is to maximize efficiencies by sharing information and increasing testing strategically
- Strengthening testing for specific products as appropriate (i.e. with spec revision)

Maintaining the Value: Overview of Current EPA Verification Testing

	EPA Testing	Manufacturer Testing	Third-Party Testing
Product Selection	EPA Determined Range of top-selling models	EPA Determined (formal input from others) ≤2 products/mfg/yr	Program Determined (only participating manufacturers) Designed to be random/unpredictable Challenge testing
Sample Size	1 unit of each model ~15 models	3 units of RLF; 13 units of combo ~10 models	Varies; 1-3 units of each model Many test all models in 2-3 yr span
Testing Frequency	Throughout year for different product categories	Up to 2 rounds per year	Typically once a year
Funding	EPA	Manufacturer	Manufacturer

Maintaining the Value: Overview of Current EPA Verification Testing

- EPA Testing
  - EPA selects models
  - EPA secures lab to procure and test models
  - Lab shares results with EPA
  - EPA works with manufacturers to resolve issues as necessary
  - Results aggregated across products categories
- Manufacturer Testing
  - EPA selects models and informs mfg
  - Manufacturer secures lab to procure and test models
  - Lab shares results with manufacturer and EPA
- Third-Party Testing
  - Third-party certification program covers participating manufacturers only
  - Program selects products; obtains and tests them; resolves issues as necessary

Maintaining the Value: Key Considerations for Computers

- Model approach for other products
- Needs to be transparent, credible, and cost-effective
- Also needs to:
  - Eliminate possible biases in product selection and procurement
  - Further confidence in consumers, manufacturers, and regulators

Next Steps

- Follow-up conversation to discuss potential paths
  - How could manufacturer's current quality assurance testing programs play a role?
  - Other relevant third-party testing?
- After the discussions referenced above, EPA will draft a proposed approach, distribute the draft(s) to stakeholders, and invite comment
- Finalize plan for moving forward concurrent with Version 5.0

Contact Information

Thank you for your participation and continued support of the ENERGY STAR program.

Please address questions and comments to:
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Materials will be posted to the ENERGY STAR Computer Specification Revision page -
http://energystar.gov/index.cfm?c=revisions.computer_spec