ENERGY STAR® Computer Stakeholder Online Meeting

Version 4.0 – Tier 2: Overview and Key Topics

December 6, 2007

Meeting Agenda

I. Welcome and Introductions

II. Review of the Tier 2 Discussion Guide with Facilitated Discussion

A. ENERGY STAR Computer Program Background
B. EEPA Approach
C. Product Categories
D. Requirement Categories
E. Power Supplies and Component Requirements
F. Power Management and Networking
G. Testing and Reporting

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

IV. Adjourn

ENERGY STAR® Computer Stakeholder Online Meeting:

II. Review of the Tier 2 Discussion Guide with Facilitated Discussion

ENERGY STAR Computer Program Background: Review of Tier 1

- 1st version of specification launched 1992
  - Desktops and integrated computers; focus on sleep mode
- Subsequent revisions tightened sleep mode levels and ensured power management enabling
  - Version 2.0: power management requirements specified
  - Version 3.0: tightened sleep requirements for integrated, ability to sleep in networked environment, power supply scaling introduced for desktops
- September 2004 – EPA announces intent to revise specification at Intel Technology Symposium
  - Tier 1 focus: address active and standby modes including internal power supply minimum efficiency requirements
  - Tier 2 focus: develop a holistic approach to computer efficiency

ENERGY STAR Computer Program Background: Review of Tier 1 (cont'd)

- Tier 1 effective on July 20, 2007
  - Desktops, notebooks, workstations, desktop derived servers, integrated computers, and game consoles
  - Sleep, standby, idle performance levels
  - External and internal power supply requirements
  - Power management requirements
- **35 manufacturers** have qualified **649 models**
- A computer meeting the new ENERGY STAR specification will use between **20% and 50% less energy** depending on how it is used.
- Tier 2 effective July 1, 2009

At a Glance: 4.0 Requirements

Tier 1 Energy Efficiency Requirements	
Product Type	**Tier 1 Requirements**
Desktops, Integrated Computers, Desktop-Derived Servers and Gaming Consoles	**Standby (Off Mode):** ≤ 2.0 W **Sleep Mode:** ≤ 4.0 W **Idle State:** **Category A:** ≤ 50.0 W **Category B:** ≤ 65.0 W **Category C:** ≤ 95.0 W ***Note: Desktop-derived servers (as defined in section 1. F) are exempt from the Sleep level above.***
Notebooks and Tablets	**Standby (Off Mode):** ≤ 1.0 W **Sleep Mode:** ≤ 1.7 W **Idle State:** **Category A:** ≤ 14.0 W **Category B:** ≤ 22.0 W
Workstations	**TEC Power (PTEC):** ≤ 0.35 * [**PMax + (# HDDs * 5)**] W ***Note: Where Pmax is the maximum power drawn by the system as tested per the test procedure in Section 4 of Appendix A, and #HDD is the number of installed hard drives in the system.***

ENERGY STAR Computer Program Background: Review of Tier 1 (cont'd)

- Tier 1 Specification Language Regarding Tier 2
  - **"Tier 2 Energy Efficiency Performance Metric"** [now termed an *Energy Efficiency Performance Assessment* (*EEPA*)]

- or -

  - **"Provisional Tier 2 Idle State Requirements"** if an energy efficiency performance metric is not in place in time for Tier 2 to become effective in July 2009. Expectation recognize top 25% for all product types covered in Tier 1 plus others (e.g., thin clients)

Energy Efficiency Performance Assessment (EEPA) Approach

- Goals:
  - Allow specification to more effectively scale efficiency metrics to the performance and functionality;
  - simplify testing;
  - provide greater specification longevity; and
  - drive consumers toward energy efficiency along with capability and function.
- EEPA Software tool runs computer through a consensus workload and collects data on how the computer performs in addressing this workload.
- Collected data can be used in conjunction with data on the power required to assess how effectively a computer is “translating” energy into desired performance.

Energy Efficiency Performance Assessment (EEPA) Approach

- Ecma TC38-TG2 on “Energy Efficiency” developing 3 component standard:
  - System classification
  - Compute performance and capability measurements
  - Energy consumption over a defined workload / duty cycle per classification
- BAPCo (the Business Applications Performance Corporation) producing software to support this standard:
  - Targets include desktops and notebooks.
  - Windows Vista and Mac OS X, support for Linux is to be added subsequently.
  - Office Productivity and Rich Media Workloads.

ECMA Participation

- Industry: AMD, Apple, Dell, HP, IBM, Intel, Lexmark, Microsoft, NVIDIA, Sony, Toshiba, VIA Technologies, Ricoh, Novell
- EU Gov: AEA Technology (UK), EC consultant
- EPA Consultants: ECOS, ICF, LBNL, Terra Novum

Key Topics for Tier 2

Energy Efficiency Performance Assessment (EEPA) Approach

- Development of specification levels based on results for desktops/notebooks running EEPA software and a consensus usage scenario representing common user tasks.

Stakeholder Comments:
Energy Efficiency Performance Assessment (EEPA) Approach

A. What challenges does platform dependence introduce to the ENERGY STAR Computer program?
B. How can performance under different EEPA workloads best be integrated into ENERGY STAR?
C. Do stakeholders believe that when paired with a calculated annual energy use value, an EEPA tool like EEcoMark will be a reasonable means of comparing the energy use of desktops? Notebooks?
D. Should the EEPA take into account different usage patterns for businesses compared to home users in arriving at a consensus usage scenario?
E. Should the EEPA reflect typical usage patterns of computer users in all ENERGY STAR countries in arriving at a consensus usage scenario?
F. How does the proposed EEPA approach mesh with the Climate Savers Computing Initiative, which bases qualification largely on the efficiency of internal power supplies and motherboards?

Key Topics for Tier 2

Product Categories

- EEPA approach focuses on desktop and notebook computers, and would likely be applicable for associated sub groups of these categories as well (integrated computers and tablet PCs).
- Other product categories – Desktop Derived Servers, Workstations, etc. - may require separate provisions to be addressed under the Tier 2 Specification

Stakeholder Comments:
Product Categories

G. Are sleep levels are appropriate for Desktop-Derived Servers covered in the Computers Specification?
H. Should EPA use the same approach used in Tier 1 for Workstations or should they be handled differently?
I. Should Game Consoles be covered under the Tier 2 Computer Specification or treated in a separate specification altogether? What test methods are applicable/available for this product category?
J. Should Thin Clients be evaluated alongside other computer categories in the ENERGY STAR Computer Specification? What research is available on energy consumption of thin clients and their impact on overall data center energy use?
K. Are there additional products that should be considered for inclusion in this Tier 2 Specification?

Key Topics for Tier 2

Requirement Categories

- Tier 1 included hardware-based Idle State requirement classifications intended to scale power use by capability of the system
- The EEPA should more accurately scale power requirements to the capability of the individual systems and hopefully eliminate need for Tier 1 type categorizations.

Stakeholder Comments:
Requirement Categories

L. Will an EEPA approach lessen the dependence on categorization of systems, as was done for Idle State requirements in Tier 1?

Key Topics for Tier 2

Power Supplies and Components

- Some component level considerations may remain necessary in Tier 2.
- Stakeholders are encouraged to provide examples, and supporting data, for emerging technologies that were not included in Tier 1 that provide further energy saving opportunities at the component level

Stakeholder Comments:
Power Supplies and Components

M. Are the Tier 1 component-level requirements for internal/external power supplies appropriate when used in conjunction with an EEPA tool such as EEcoMark? Alternatively, if they are appropriate, should component level requirements for internal/external power supplies be made more stringent?

N. ENERGY STAR's existing Tier 1 framework requires measurement of desktop computers and workstations with keyboard and mouse attached. Consistent with these measures to create a realistic testing situation, should any commonly used peripherals be included in Tier 2 test procedures to accurately reflect real-world usage (i.e. keyboards, mice, USB peripherals, docking stations)?

O. What new energy-saving technologies becoming prevalent on the market are worth special consideration in Tier 2?

Key Topics for Tier 2

Power Management and Network Requirements

- The ENERGY STAR Computer program remains committed to encouraging use of power management in qualified computers.
- EPA intends to retain network requirements under Tier 2, including Wake On LAN requirements, and support both “reduction of network link speed during times of low traffic” and “maintenance of full network connectivity while in Sleep mode” requirements listed as intents for Tier 2 in the previous document.

Stakeholder Comments:
Power Management and Network Requirements

P. Are any allowances for additional management tools that aid in the adoption of computer power management (such as service processors in Sleep and Standby) worth consideration?

Q. How should the Tier 1 network provisions (reduction of the speed of active Ethernet network links when transitioning to Sleep or Standby/Off, maintaining full network presence in Sleep, and Wake-On-LAN) be evaluated under the EEPA approach?

Key Topics for Tier 2

Testing Procedure and Reporting Requirements

- Workload and usage pattern data will be required to support EEPA tool development.
- ENERGY STAR intends to compile energy use and performance data on a computer sample set once the EEPA tool is completed.
- EPA may reevaluate enablement of monitors in notebook/integrated computer testing if data and stakeholder comment supports revision.

Stakeholder Comments:
Testing Procedure and Reporting Requirements

R. Should EPA investigate power levels for notebooks and integrated computers that incorporate the energy use of the displays?

S. What data collection is necessary to support the EEPA tool development? To support meaningful ENERGY STAR requirement levels?

T. When a final list of qualifying Tier 2 computers is eventually posted to the ENERGY STAR web site, the program intends to post annual energy consumption figures and performance information to better inform consumers. Posting of this information is also being proposed for televisions. EPA invites feedback on this plan.

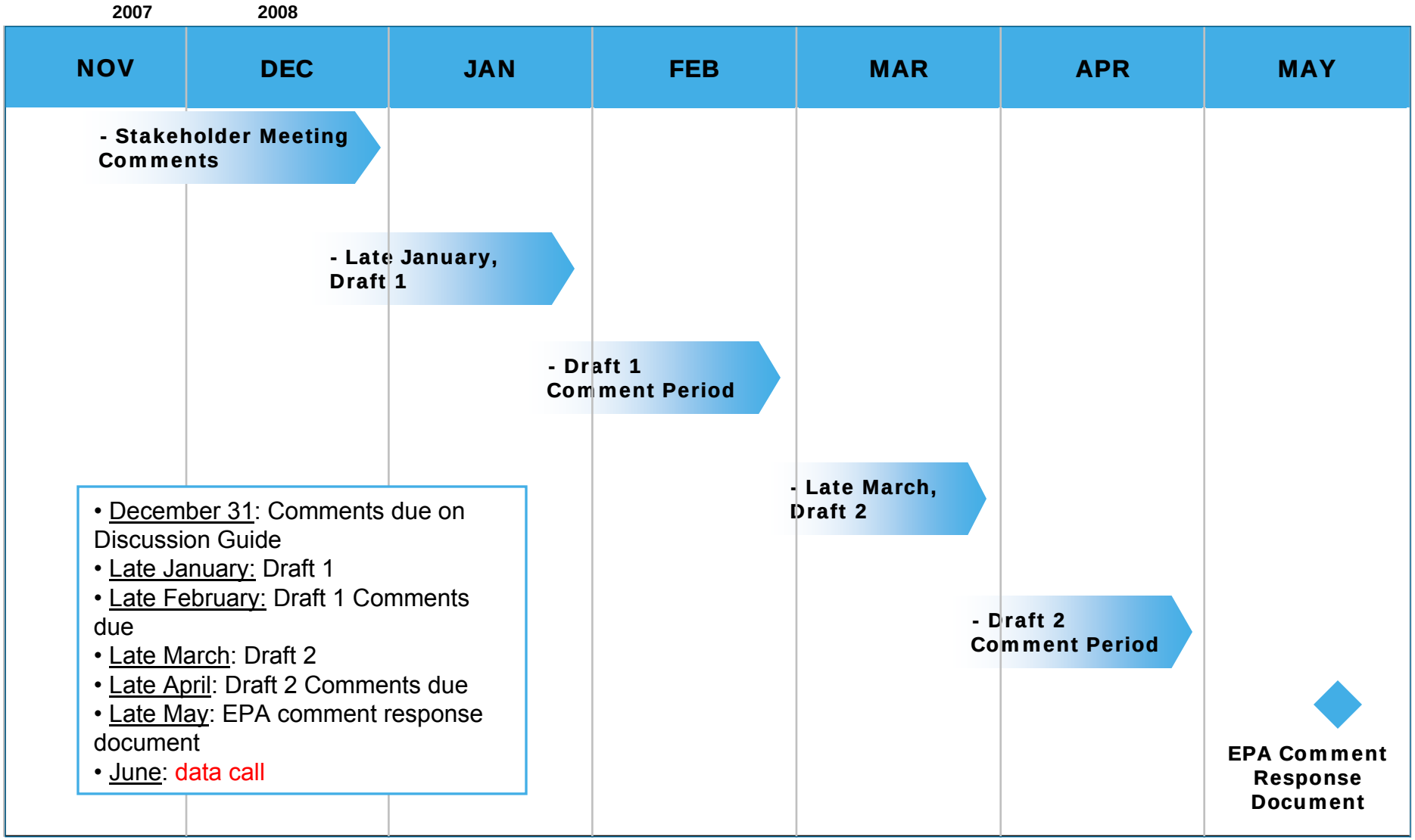
ENERGY STAR® Computer Stakeholder Online Meeting:

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

Timeline

- November 2007 to June 2008, EPA and EC work with stakeholders to develop and refine the Tier 2 approach, covered products, definitions.
- June 2008, Ecma standard and EEcoMark software become available and EPA and EC collect data to inform Tier 2 levels.
- October 2008, EPA and the EC finalize Tier 2 Computer Specification
- July 2009, Tier 2 Specification goes into effect.

Timeline


2007
2008
NOV
DEC
JAN
FEB
MAR
APR
MAY
- Stakeholder Meeting Comments
- Late January, Draft 1
- Draft 1 Comment Period
- Late March, Draft 2
- Draft 2 Comment Period
• December 31: Comments due on Discussion Guide
• Late January: Draft 1
• Late February: Draft 1 Comments due
• Late March: Draft 2
• Late April: Draft 2 Comments due
• Late May: EPA comment response document
• June: data call
EPA Comment Response Document

Contact Information

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

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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