ENERGY STAR® Update

Summary of Comments on Preliminary Draft V4.0 Computer Specification

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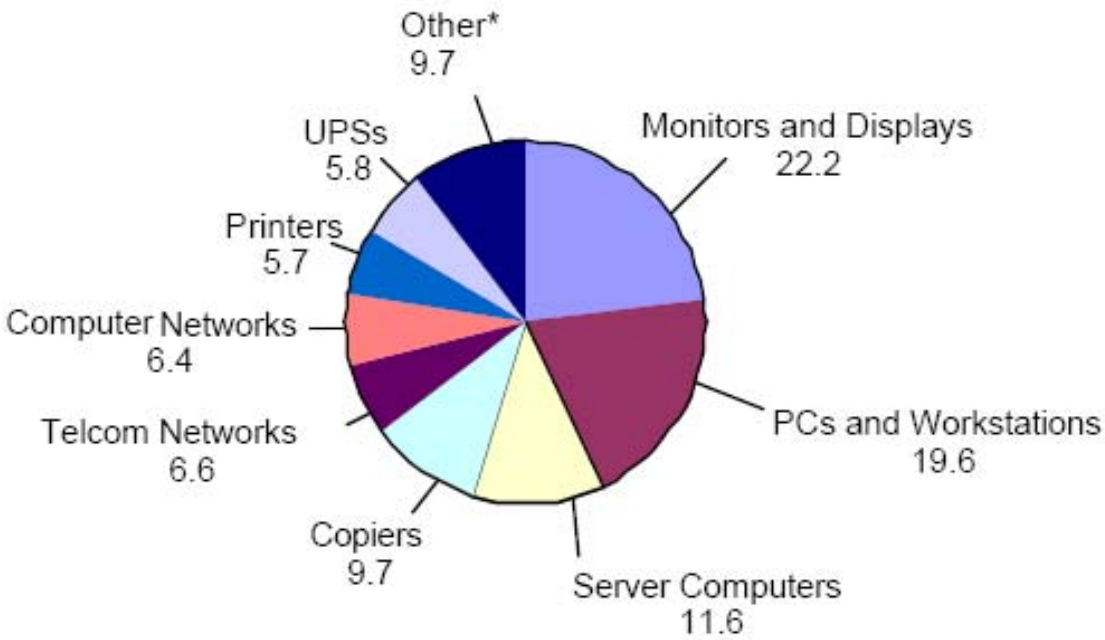
EPA Goals and Expectations

- Address power management issues and retain the requirement within the specification
  - Recognition that savings are user dependent and will take time to resolve and implement
- Continue with existing specification revisions to address active, sleep, standby energy use
- Finalize Tier I requirements by the end of 2005 and develop a roadmap for Tier II
- Short Term Goal: specification that recognizes products that are energy-efficient in all modes of operation
- Long Term Goal: determine whole machine performance approach and address both small and large servers

Computer and Monitor Energy Use More than Half of All Office and Telecom Equipment Energy Use

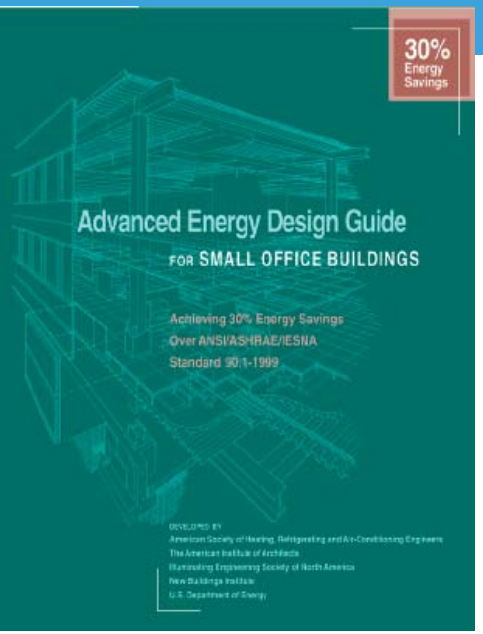


Total AEC Office and Telecommunications Equipment = 97 TW-h Site or ~1.1 quad Primary

Figure 2-1: Non-Residential Office and Telecommunications Equipment Annual Energy Consumption for Y2000, in quadrillion primary Btu (quads)

Source: Kurt Roth et. al, *Energy Consumption by Office and Telecommunications Equipment in Commercial Buildings; Volume 1: Energy Consumption Baseline,* Arthur D Little, Jan. 2002.

ASHRAE Analysis Confirms Significance of Plug Loads Especially in Highly Efficient Buildings



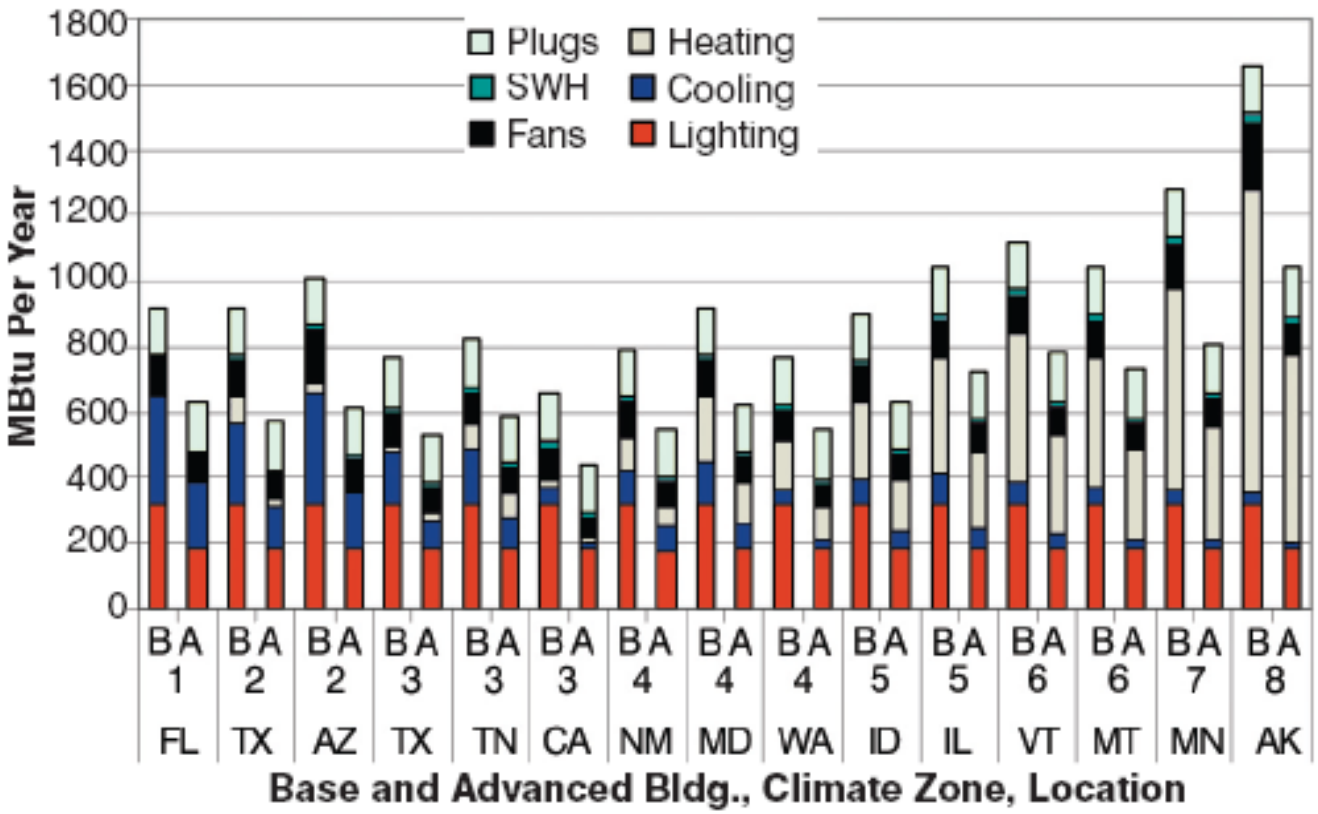
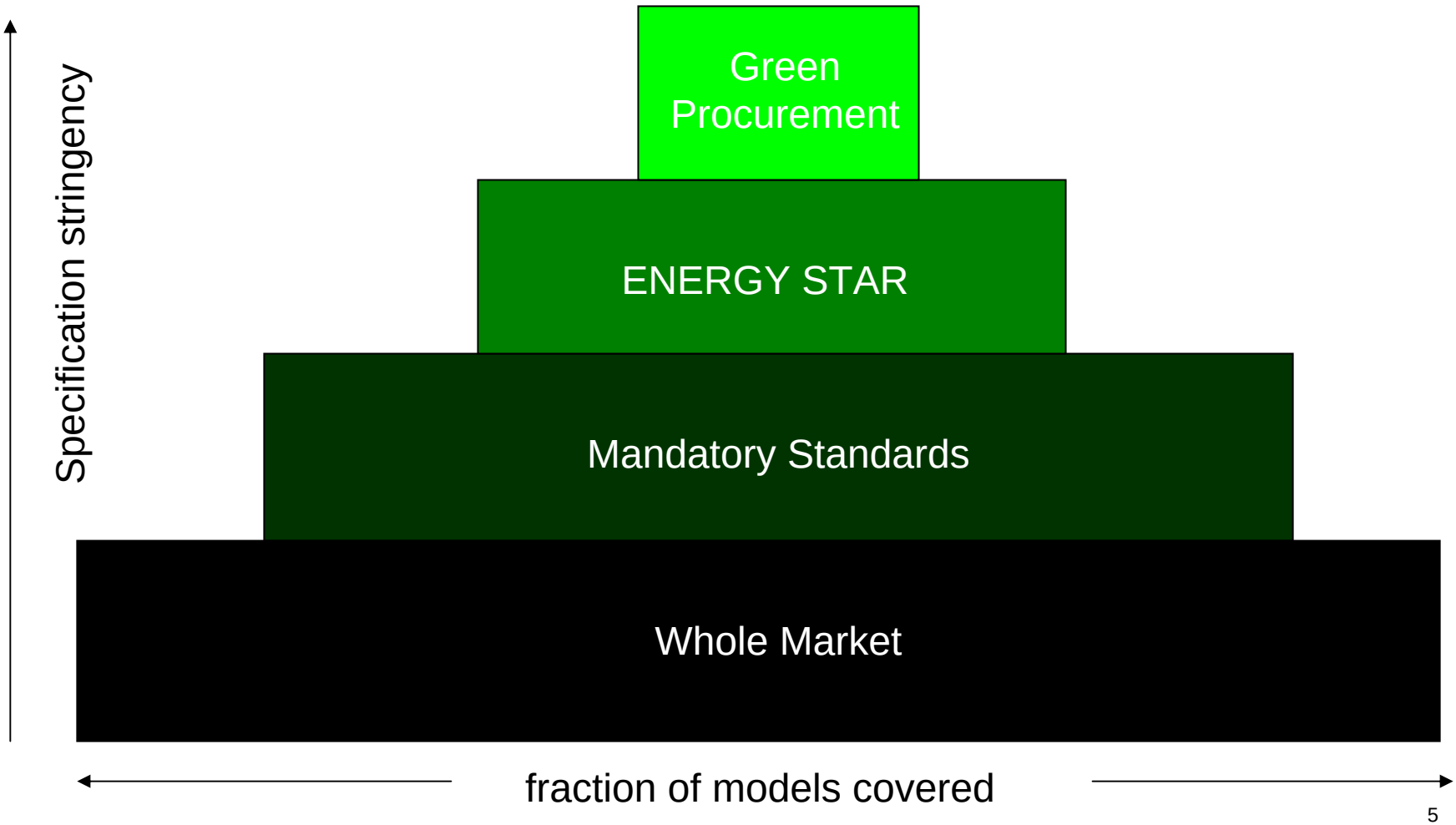


Figure 4b: 20,000 ft² building.

Plug loads are 10% (cold climates) to 30% (mild climates) of total energy use in efficient buildings

If ENERGY STAR Specs Not Stringent Enough Procurement Organizations Set Tighter Ones



International Support

- Partner countries support:
  - Continued target of top 25% of market
  - Harmonization of test procedures/specifications globally
  - Consideration of different voltage/frequency configurations for ENERGY STAR qualification
  - Performance requirements recognizing all operational modes including “idle mode” for computers
  - Finalization of specification by end of year

Natural Resources Canada
Ressources naturelles Canada

Australian Government
Department of the Environment and Heritage
Australian Greenhouse Office

Stakeholder Comments

- 10+ comment submissions from manufacturers, international groups, and other interested parties
- General EPA/stakeholder agreement that:
  - Ultimately develop some kind of performance based benchmark that can be used across all subcategories
  - Power management disabling is a problem that needs to be addressed now
  - New specification should consider future innovation and increased functionality
  - Product subcategories need to be further differentiated

Key Comment Areas

- Definitions
- Sleep and Standby Requirements
- Power Supply Efficiency Requirements
- Idle Mode Requirements
- Product Labeling
- Elimination of Grandfathering

Definitions

Comments:

- Workstation and server definitions need more work to effectively carve out product categories

EPA Preliminary Response:

- EPA recognizes the need to further differentiate the different product types to address their performance needs
- Technical and marketing elements of definition

Sleep Mode Requirements

Comments

- Proposed 5 W limit unrealistic for workstations
- Tiered or sliding scale approach should be considered

EPA Preliminary Response:

- EPA is open to exploring a sliding scale. The following needs to occur:
  - Workstations need to be further defined and differentiated from desktops
  - Performance data needs to be collected and reviewed

Standby Mode Requirements

Comments

- Standby mode of 0.5 W too low for notebooks
- Harmonize with CEC, Australia, New Zealand (1/2008)
- Tiered or sliding scale approach should be considered for workstations

EPA Preliminary Response:

- Standby mode is in line with proposed ENERGY STAR Tier II EPS specification
  - Another option is to simply use EPS no load specification as power supply requirement
- EPA is open to a sliding scale for workstations if data can be produced and reviewed

Power Supply Requirements

Comments

- Concerns with product availability and cost differentials
- Support incorporating the ENERGY STAR EPS specification for power supply requirements

ENERGY STAR EPS Partners

- Astec
- Ault Incorporated
- Celetronix USA Inc.
- Delta Electronics Inc.
- FRIWO Mobile Power GmbH
- Globtek Inc.
- Hipro Electronics
- Jerome Industries
- Leader Electronics, Inc.
- Li Shin International Enterprise Corp
- Lite-On Technology Corporation
- Phihong USA Corporation
- Salcomp (ShenZhen) Co. Ltd

Based on 2003 sales data, ENERGY STAR has signed up three of the top five manufacturers for North America representing **more than 30% market share***.

** Research by Darnell Group*

80 Plus Qualifying Power Supply Models

- Four models from Seasonic - 300, 400, 500, 600 watts. Quantity prices from $27 to $85 each
- Other commercial models from Acbel and Crown Young Industries
- Prototypes from Celetronix and OnSemi also qualify
- More models in testing from major manufacturers
- 9 different VARs selling them in finished systems

www.80plus.org/wheretobuy.html

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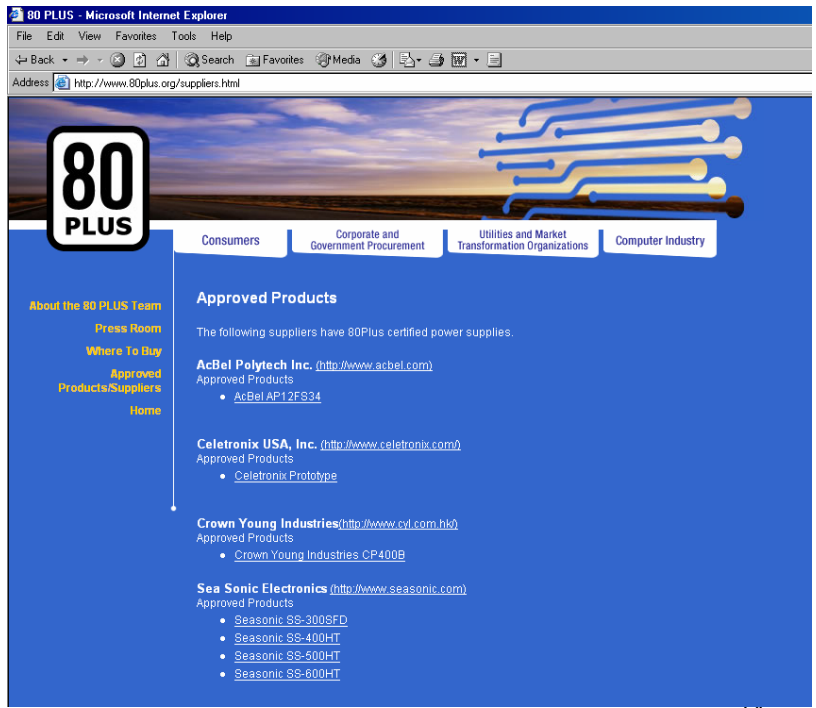
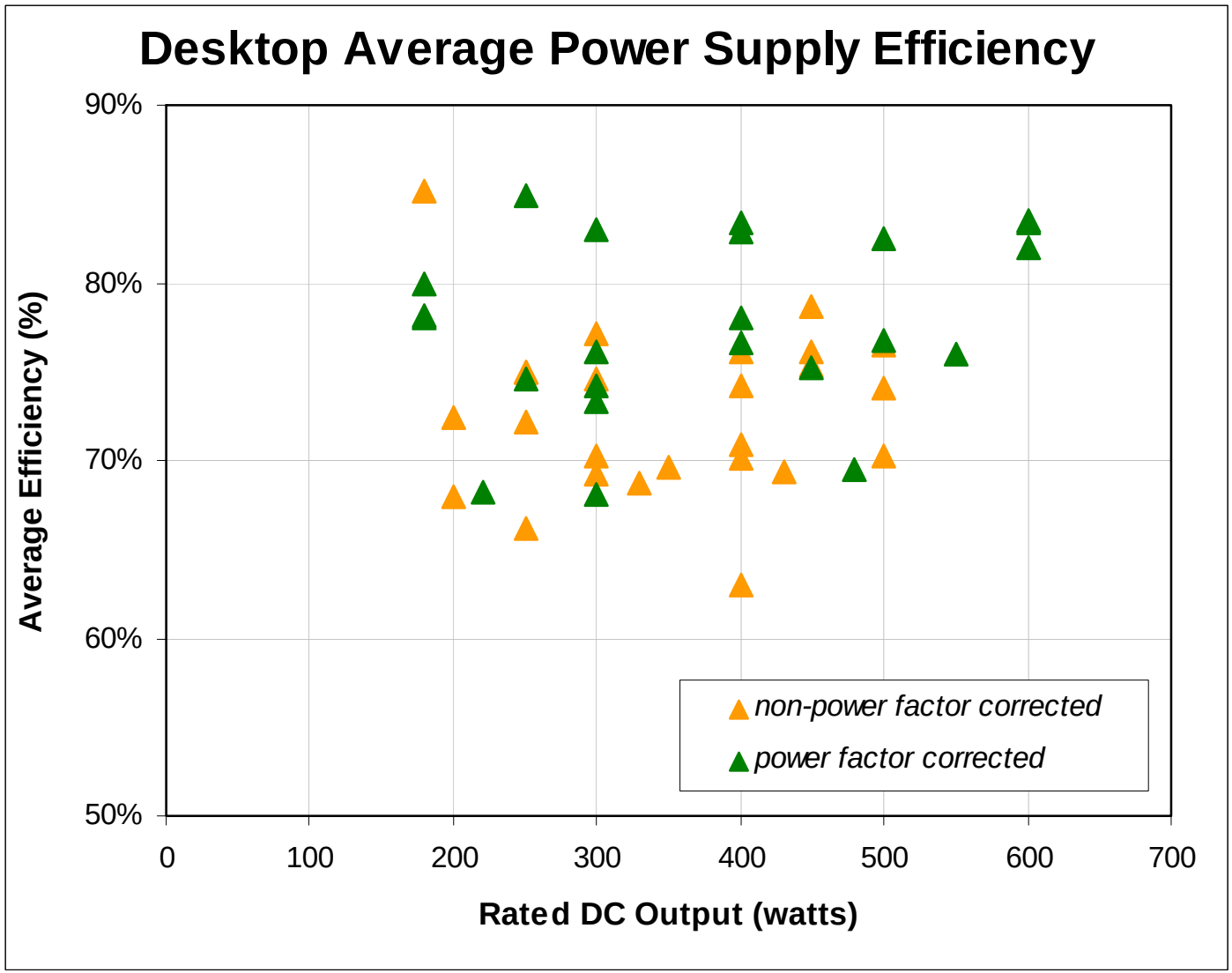
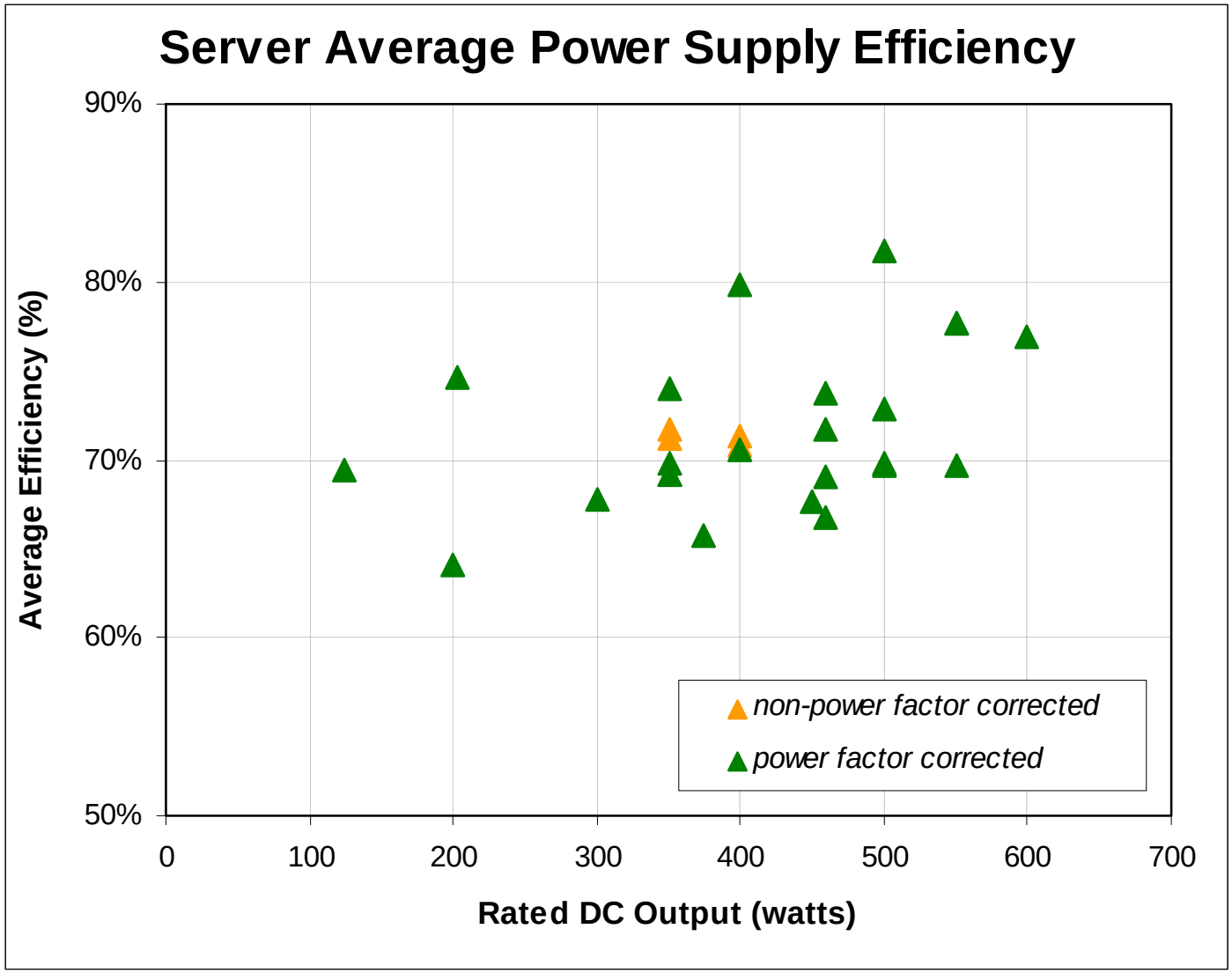


Update on Desktop Power Supply Efficiency



Server Power Supplies Lagging Desktop Efficiencies



Idle Mode/Power

Comments:

- Difficult to define – different for each manufacturer
- Standardized test procedure not available
- Address idle power by fixing the disabling problem
- Consider sliding scale for larger workstations

EPA Preliminary Response:

- EPA recognizes that there is more work to be done
- Many international organizations have defined and are already measuring idle
- More testing and discussion needed to arrive at single, globally accepted and applicable test procedure

Assessing Continuum of Measures to Reduce Energy Use in Idle Mode and/or through Power Management

	Idle Measures				Power Management Measures				
	Efficient Power Supply	**Efficient Cooling**	**Processor Throttling**	**Video Card Power Scaling**	**Enable Hard Drive Sleep**	**Enable Monitor Sleep**	**Wake on LAN Solution**	**Enable Computer Sleep**	**Manually Switch Off Computer**
Wait Time Imposed	None	None	Minimal	Minimal	<5 sec	<5 sec	10 sec	10-30 sec	>60 sec
Performance Impact	None	None	Small	Small	Small	None	Small	Maximum	Maximum
Magnitude of PC Power Savings	15-25%	<5%	10-15%	5-60%?	5-10%	<1%	40-90%	40-90%	90-95%
Extent of User Control	None	Minimal	Minimal	Minimal?	Moderate	Moderate	High	High	High
Certainty of Power Savings	High	High	High	Moderate	Moderate	Moderate	Low	Low	Low
Timeframe of Solution	0-6 months	0-6 months	0-6 months	6-18 months	Now	Now	12-24 months	Now	Now

Labeling

Comment:

- Product labeling should be voluntary

EPA Preliminary Response:

- EPA will work with manufacturers to determine the most appropriate and effective way to identify ENERGY STAR qualified models in the marketplace

Elimination of Grandfathering

Comment:

- Allow a grace period for product redesign which can take 12 – 18 months

EPA Preliminary Response:

- Grandfathering not allowed in any product category
- EPA will work with manufacturers to determine an effective date that takes into account design cycles
  - Typical time between finalization and effective date is 9 – 12 mos.

Moving Forward

- Continue working closely with all interested stakeholders to determine a specification that rewards energy efficiency while ensuring continued functionality
- Continue to hold one on one discussions and meetings with stakeholders
- Decisions on final performance levels will be determined by performance data
- Interest in holding a separate server workshop
  - Discuss large servers and associated whole building energy performance issues with manufacturers and building owners