

# ENERGY STAR® for External Power Supplies

Online Stakeholder Meeting  
November 13, 2007



*Presented by:*  
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# Meeting Agenda

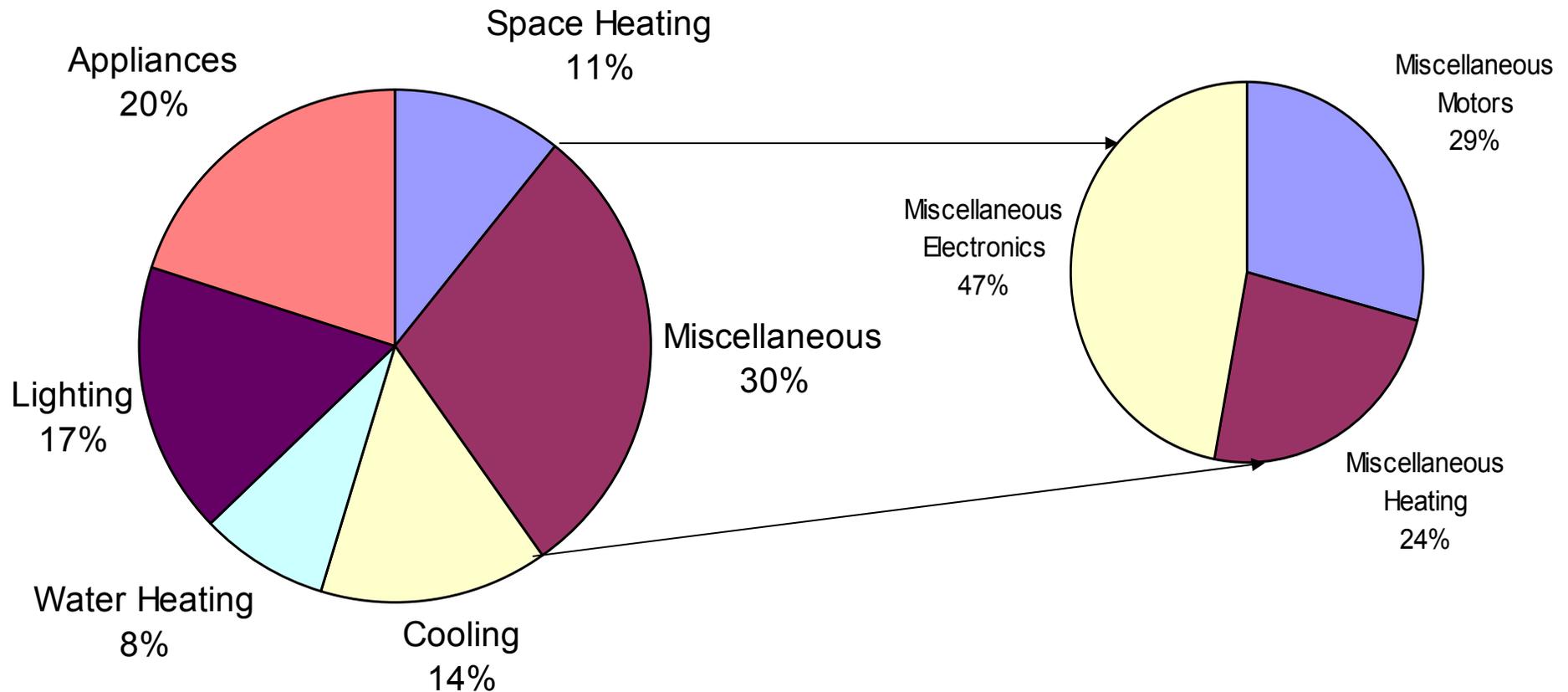


1. Welcome and Introductions (10 mins.)
2. Overview of Draft 1 Version 2.0 Specification (30 mins.)
3. Brief Discussion/Clarifying Questions from EPA Presentation (15 mins.)
4. Overview of Comments Received to Date (15 mins.)
5. Stakeholder Comments and Discussion (40 mins.)
6. Timeline and Next Steps (10 mins.)
7. Adjourn



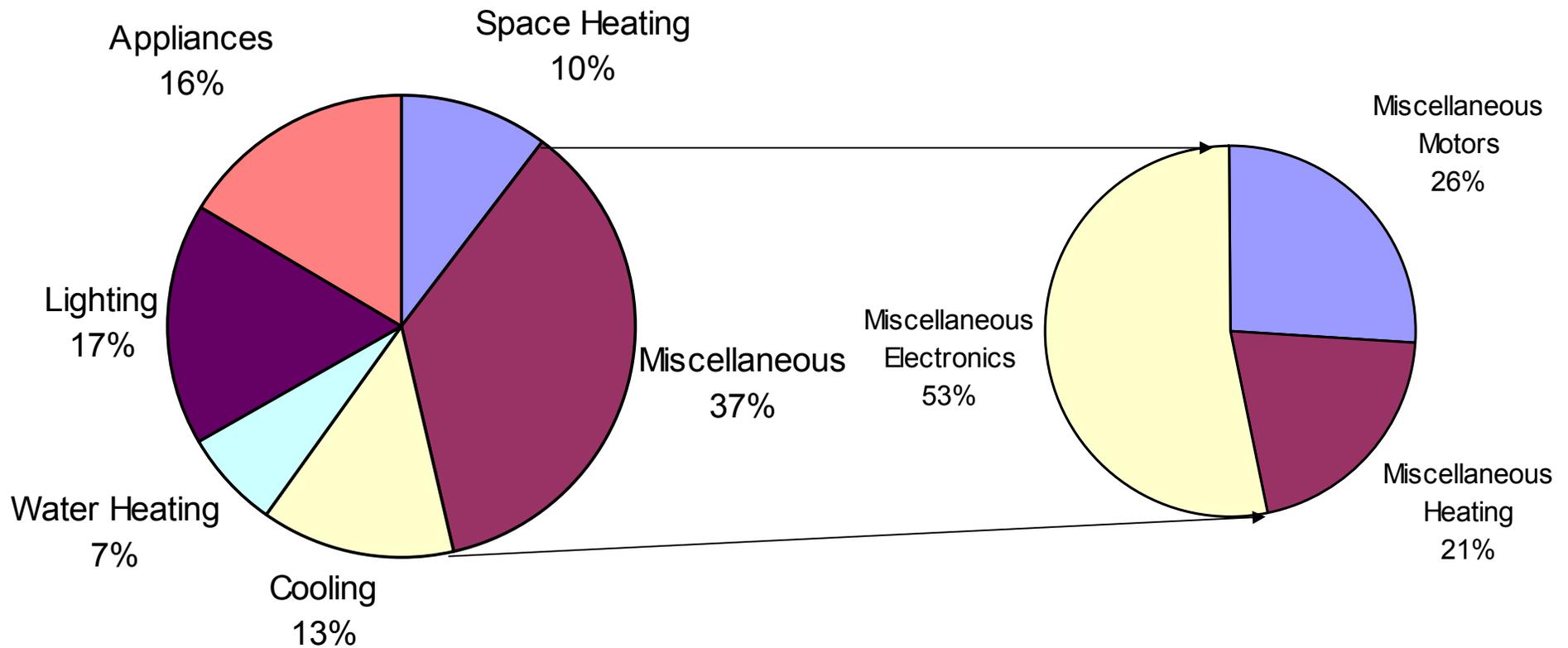
## 2. Overview of Draft 1 Version 2.0 EPS Specification

# Summary of National Residential Electricity Consumption by End Use for 2006



- Projected 2006 U.S. residential electricity consumption: 1,353 TWh
- Electronics products—under Miscellaneous—accounted for 14% of total residential electricity consumption.

# Summary of National Residential Electricity Consumption by End Use for 2020



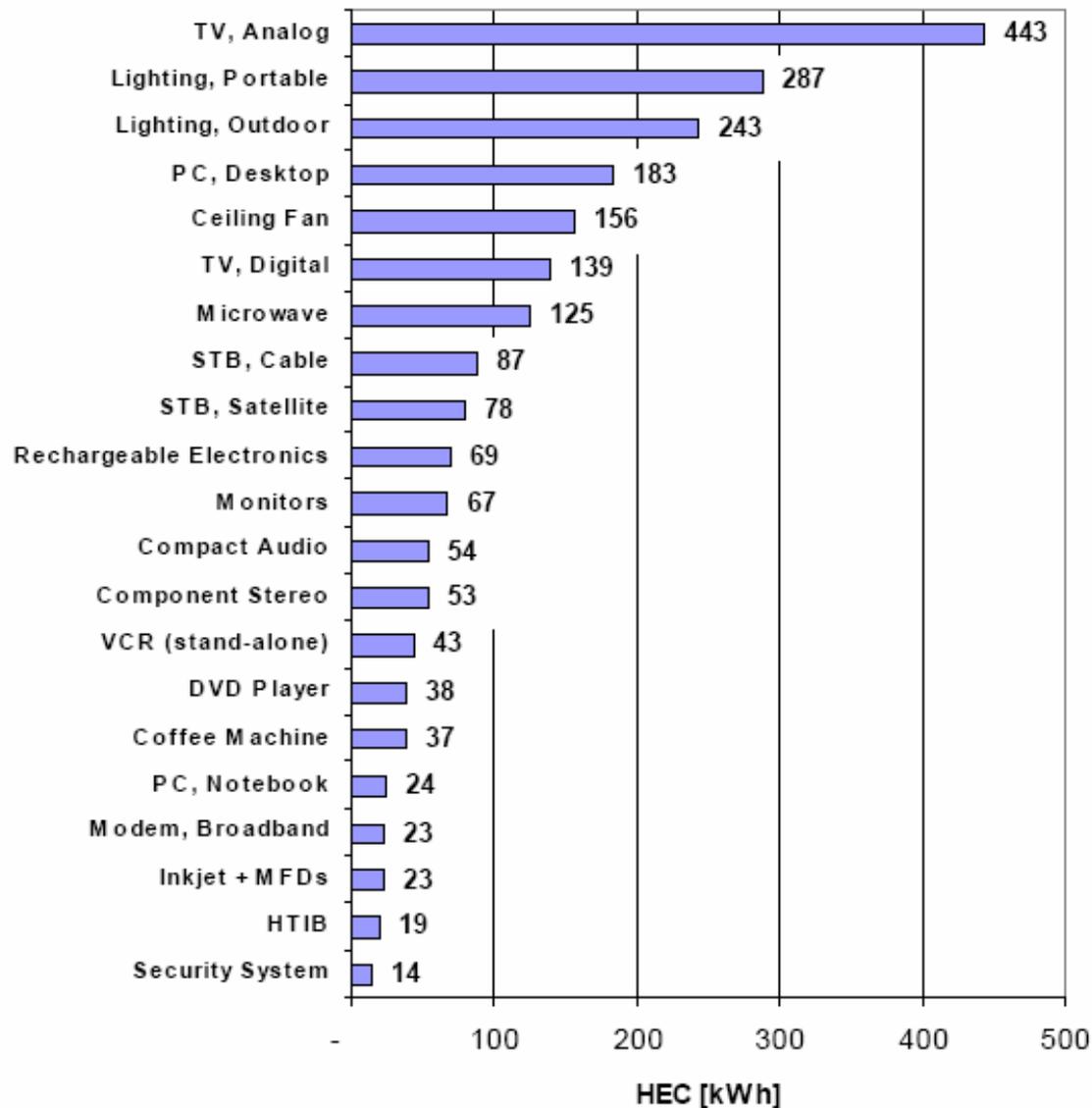
- Projected 2020 U.S. residential electricity consumption: 1,691 TWh
- Electronics products—under Miscellaneous—will account for 19% of total residential electricity consumption.

# Causes of Increasing Miscellaneous Energy Consumption



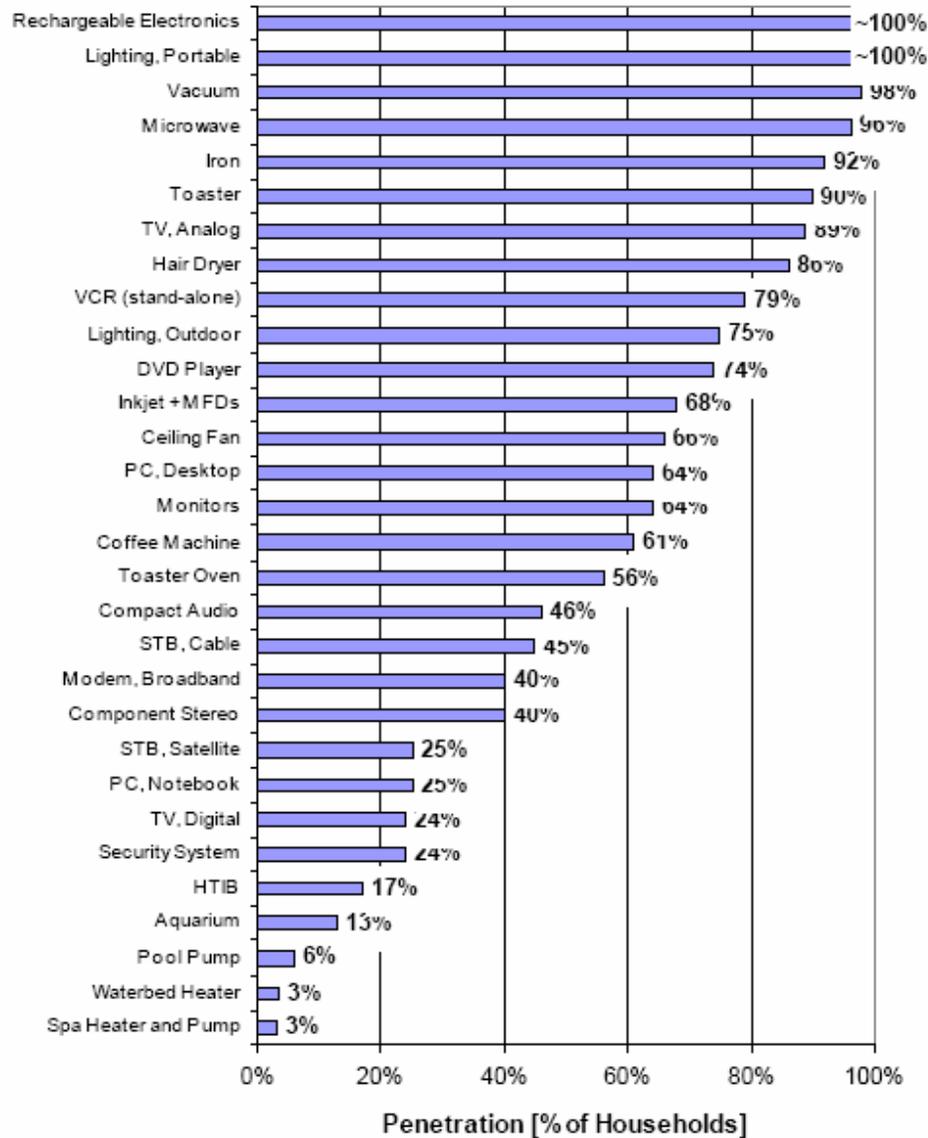
- Advances in Consumer Electronics
  - Dramatic increases in connectivity and performance
  - Decreases in cost
  - Residential installed base of consumer electronics related energy consumption doubled between 1995 and 2006
- Growth in Number of Products within Miscellaneous Category
  - More energy-intensive products
  - Average On Mode draw of products within category has increased

# Average Household Electricity Consumption for Key Products



*Residential Miscellaneous Electric Loads: Energy Consumption Characterization and Savings Potential, TIAx LLC, finalized July 2007.*

# Percentage of Households with at least One Device



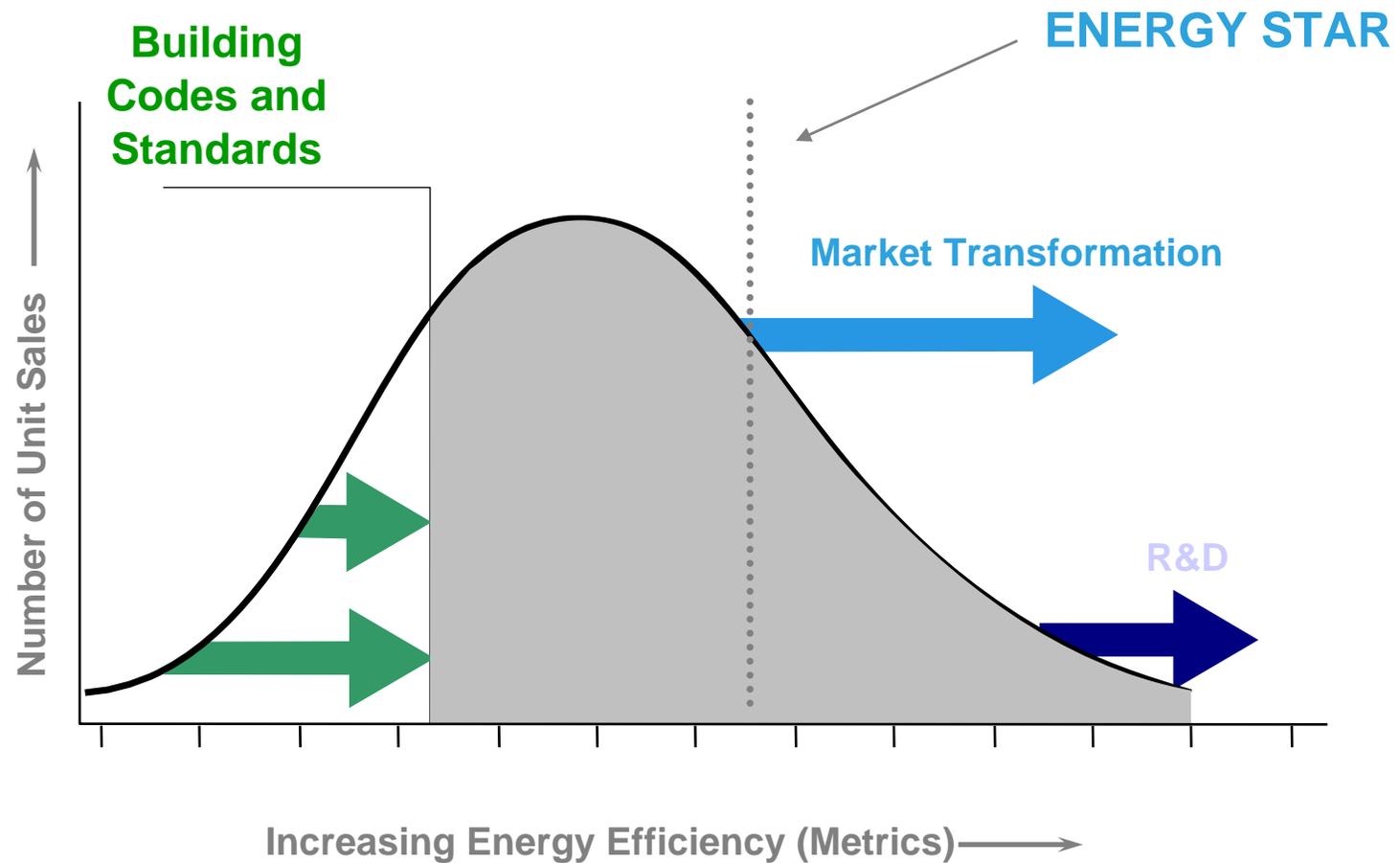
*Residential Miscellaneous Electric Loads: Energy Consumption Characterization and Savings Potential, TIAx LLC, finalized July 2007.*

# ENERGY STAR



- Protects the environment through superior energy efficiency
- Proven technology
- No tradeoffs in performance or quality
- Cost effective (2<sup>nd</sup> price tag)
- ENERGY STAR is a government backed symbol providing valuable, unbiased information – source of authority
- Binary (Y/N)
- Power of the individual to make a difference

# ENERGY STAR is Key Part of Technology Deployment



# Setting/Revising ENERGY STAR Specifications



- Key criteria:
  - Significant energy (GHG) savings will be realized on a national basis.
  - Product energy consumption and performance can be measured and verified with testing.
  - Product performance will be maintained or enhanced.
  - Purchasers of the product will recover any cost difference within a reasonable time period.
  - Specifications do not unjustly favor any one technology.
  - Labeling will effectively differentiate products to purchasers
- Use a well documented process (see chart) – for transparency

Specification Development Cycle



# Proposed EPS V2.0 Specification



Nameplate Output Power ( $P_{no}$ )	Minimum Average Efficiency in Active Mode (expressed as a decimal)
0 to $\leq$ 1 watt	$\geq 0.44 * P_{no} + 0.145$
$> 1$ to $\leq$ 36 watts	$\geq [0.08 * \ln (P_{no})] + 0.585$
$> 36$ watts	$\geq 0.870$

- Increased Active Mode efficiency requirements representing the average of measured efficiency at 25%, 50%, 75%, and 100% of rated output current.

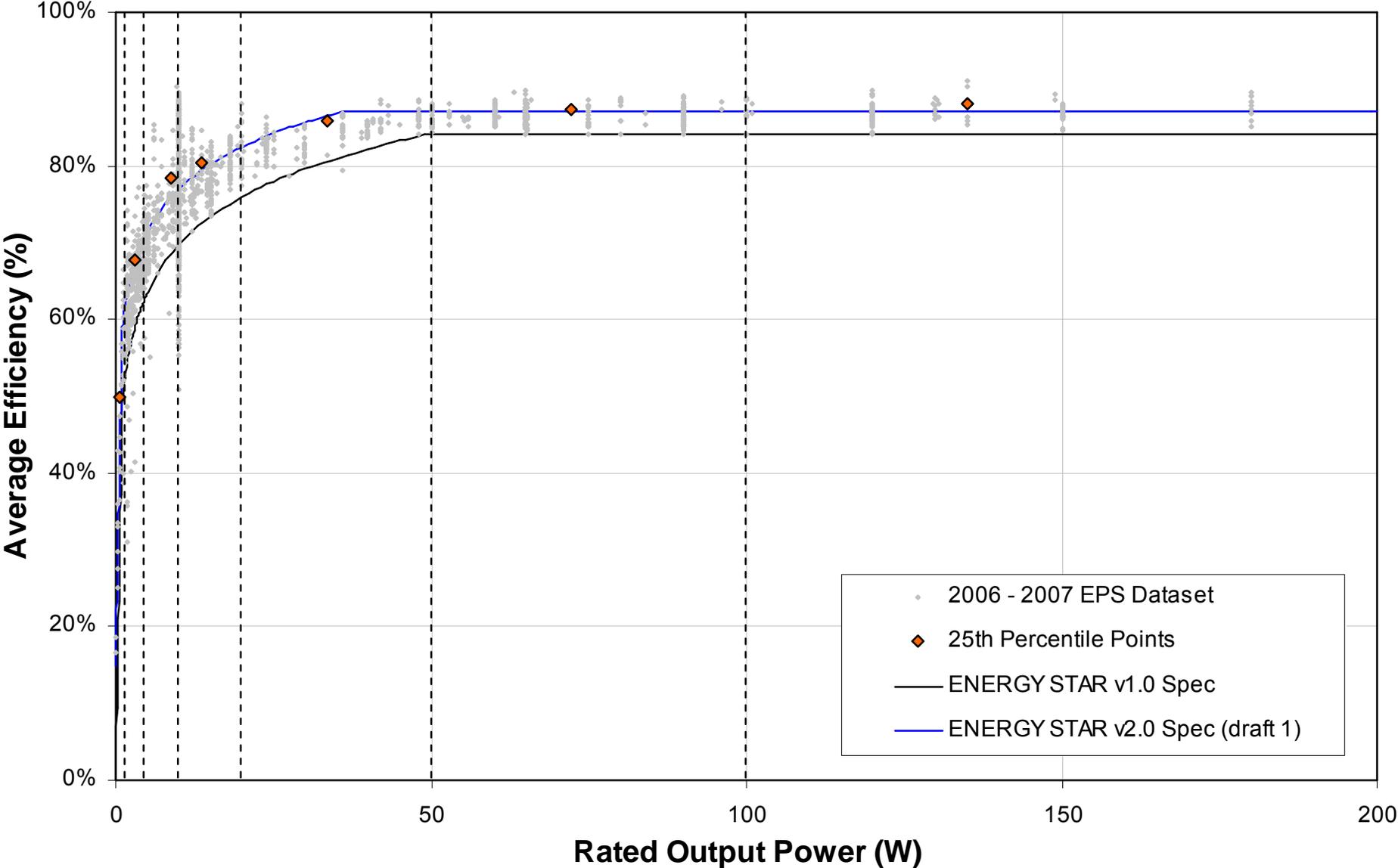
# Proposed EPS V2.0 Specification *(cont.)*



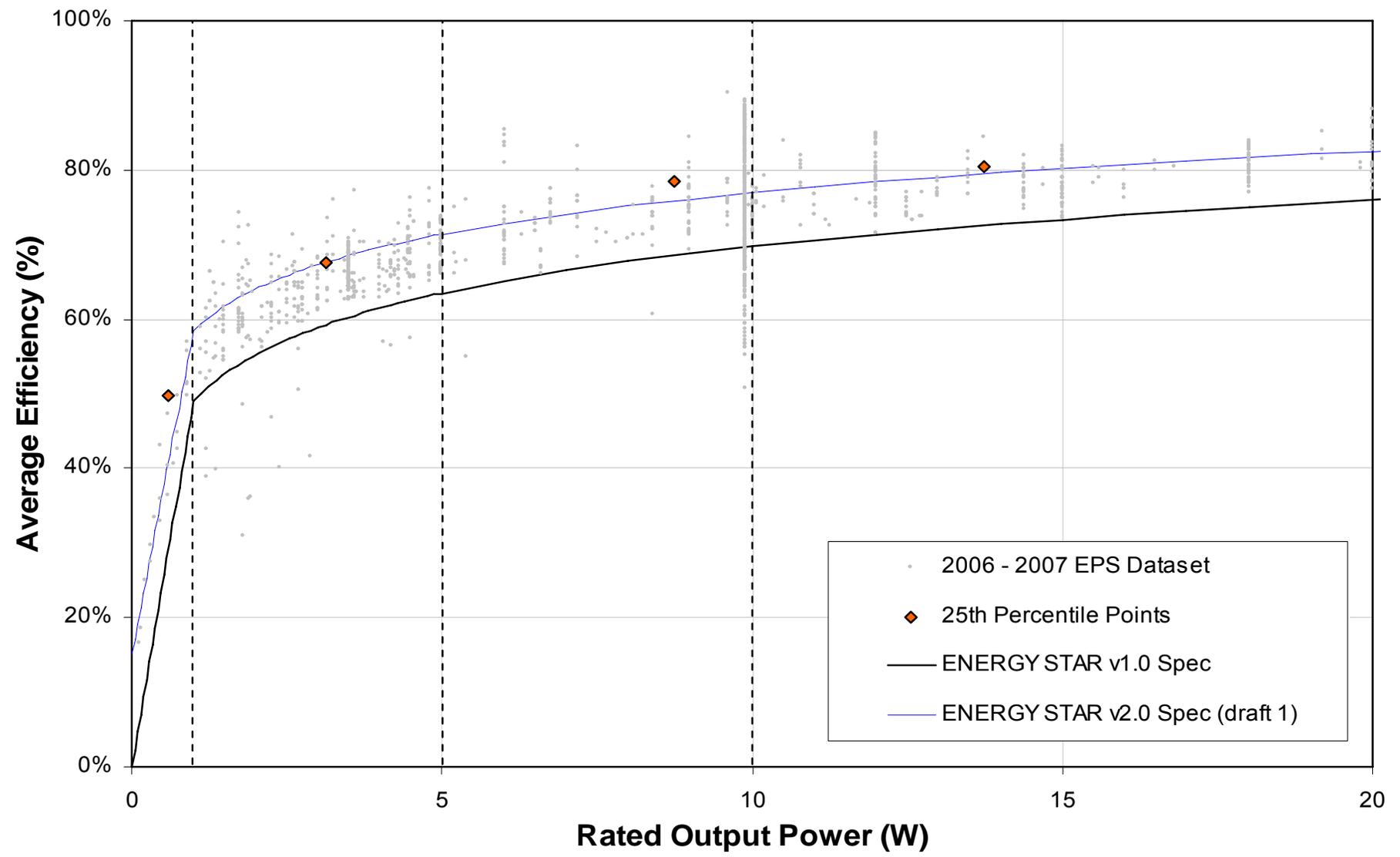
Nameplate Output Power ( $P_{no}$ )	Maximum Power in No-Load	
	Ac-Ac EPS	Ac-Dc EPS
0 to < 50 watts	$\leq 0.5$ watts	$\leq 0.3$ watts
$\geq 50$ to $\leq 250$ watts	$\leq 0.5$ watts	$\leq 0.5$ watts

- Reduced No-Load power limits.
- Added a power factor requirement of 0.9 or greater for power supplies with a nameplate output power of 75 watts or greater.

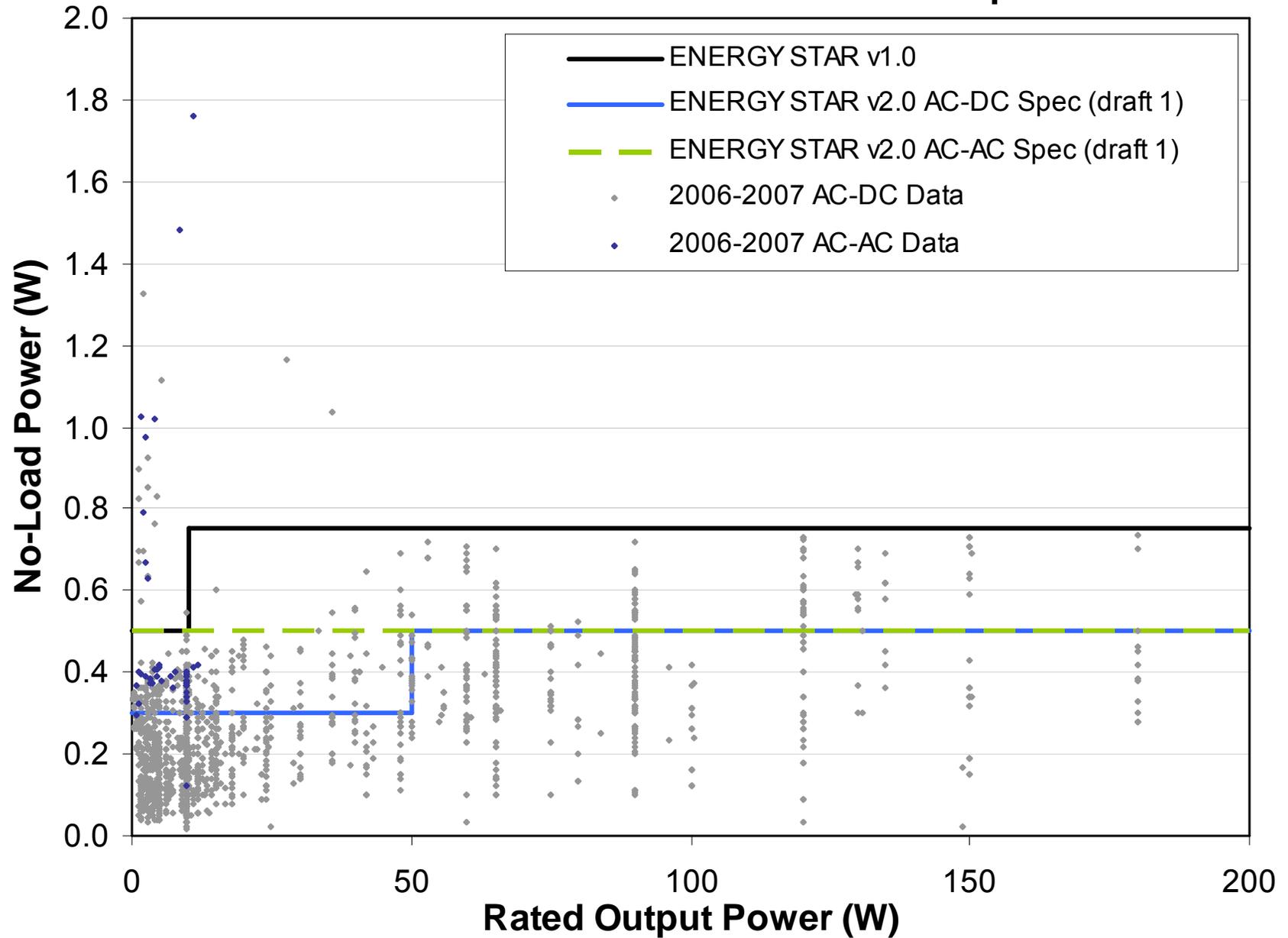
# ENERGY STAR Draft 1 v2.0 Spec with 25th Percentile Points in Current Dataset



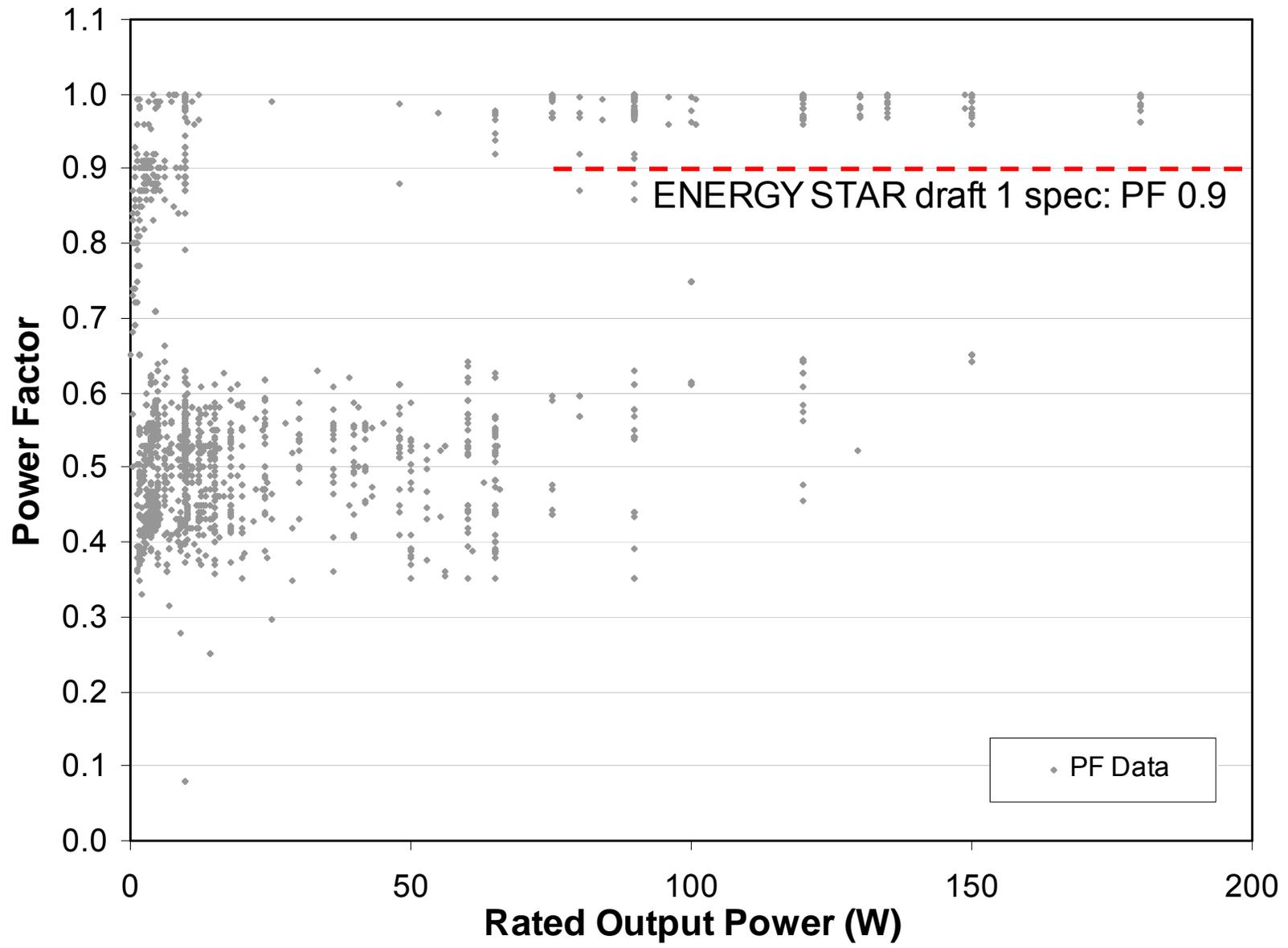
# ENERGY STAR Draft 1 v2.0 Spec with 25th Percentile Points in Current Dataset



# ENERGY STAR Draft 1 v2.0 EPS No-Load Spec



# Proposed ENERGY STAR v2.0 EPS Power Factor Spec

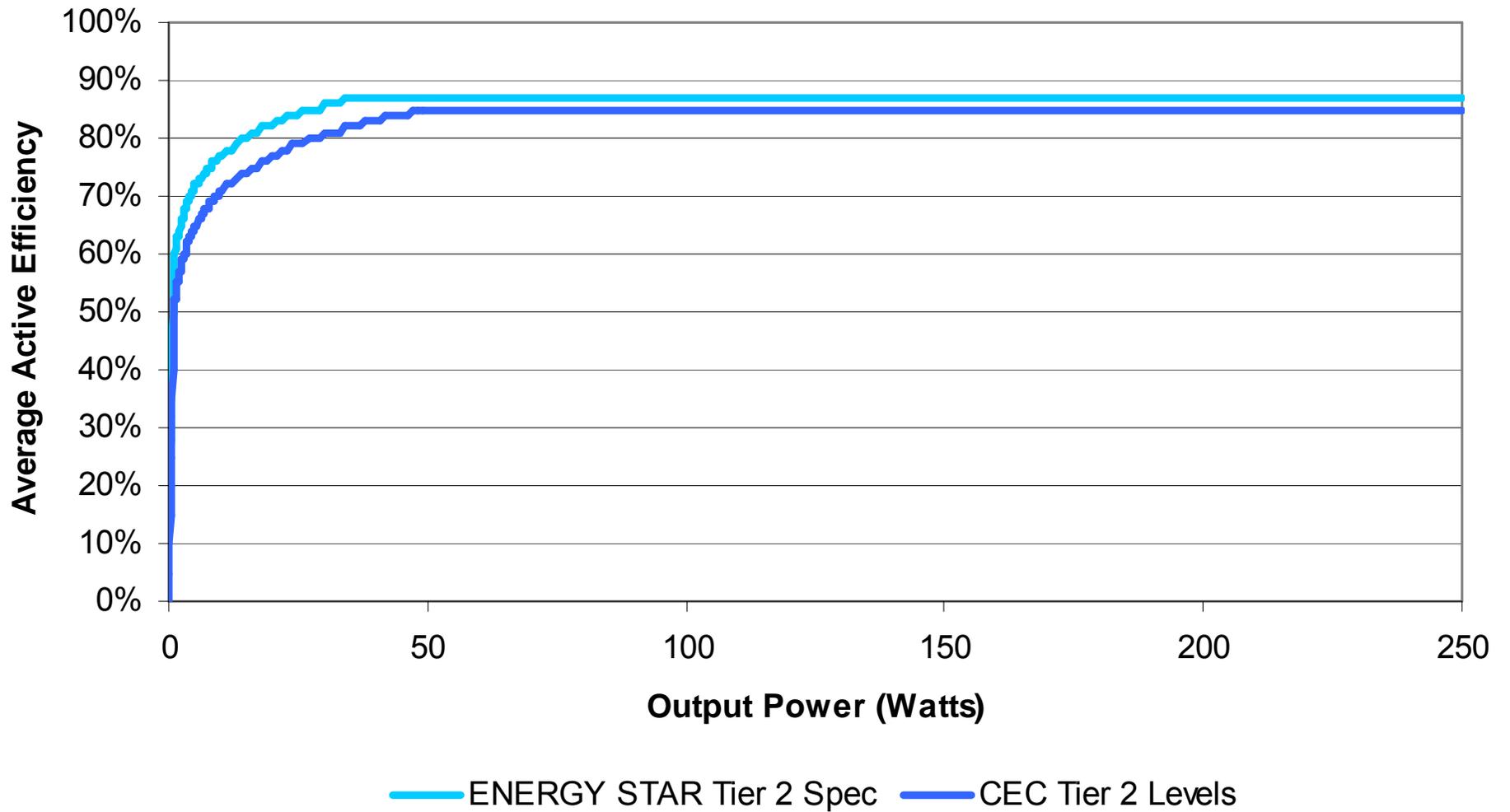


# Draft 1, V2.0 Compliance Rates

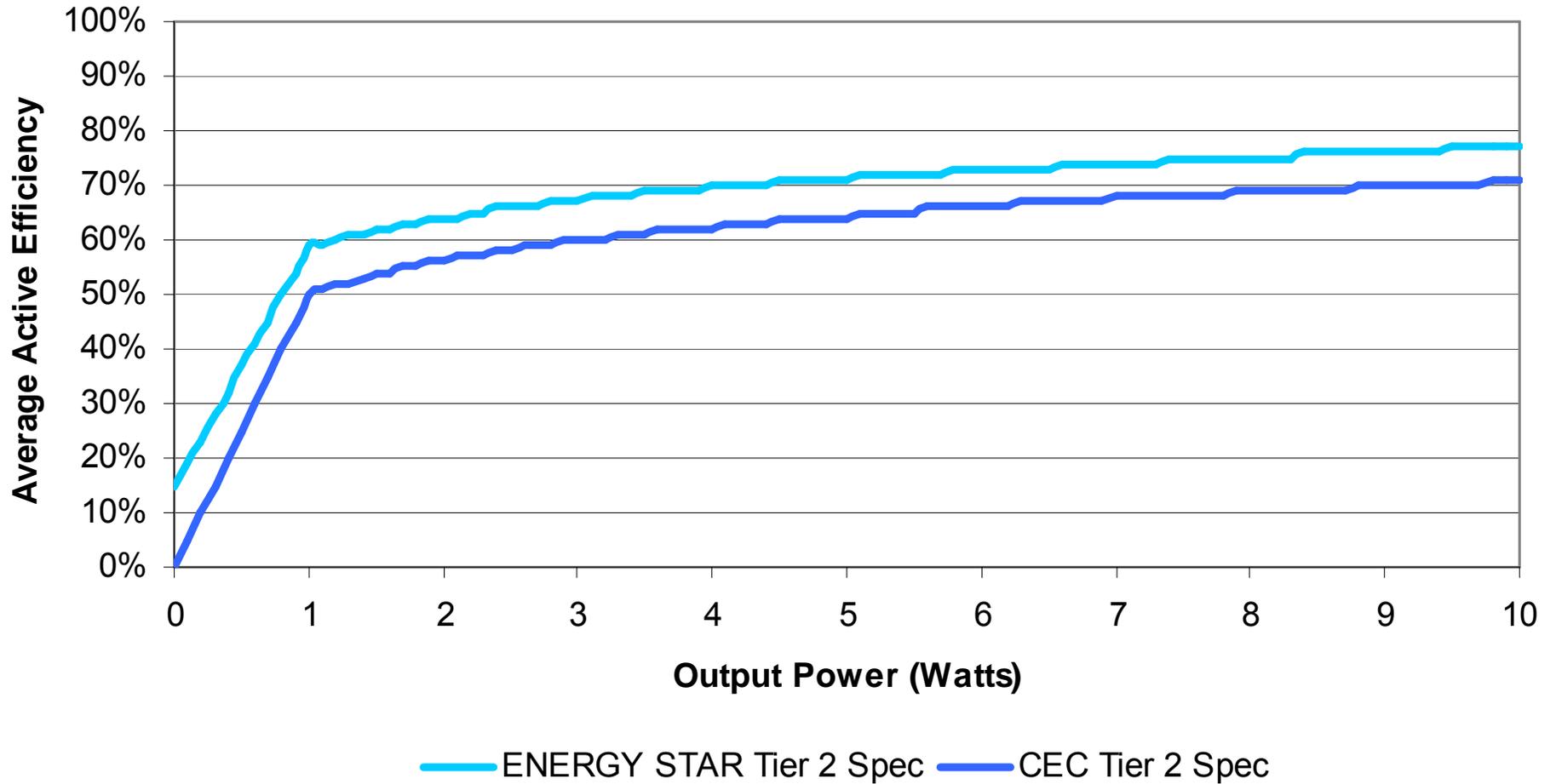


Wattage Range	Total Devices	Compliant Devices (no load)	Compliant Devices (active mode)	Compliant Devices (PF)	Compliant Devices (combined)	Compliance Rate (combined)
< 1 W	22	9	11	22	5	23%
1 - 5 W	463	400	111	463	109	24%
5 - 10 W	548	447	218	548	188	34%
10 - 20 W	247	196	75	247	64	26%
20 - 50 W	166	98	21	166	16	10%
50 - 100 W	267	212	98	233	78	29%
> 100 W	121	73	59	89	26	21%
<b>TOTALS</b>	<b>1834</b>	<b>1435</b>	<b>593</b>	<b>1768</b>	<b>486</b>	<b>26%</b>

## Average Active Efficiency Specification Vs. Output Power



## Average Active Efficiency Specification Vs. Output Power for Low Power (<10 Watts) EPS



# Cumulative EPS Savings for V1.1



<b>EPS Cumulative Savings from the Version 1.1 Specification (2006-2015)</b>	
<b>U.S. energy bill savings</b>	\$2.6 billion
<b>U.S. energy savings</b>	29 billion kWh
<b>U.S. carbon savings</b>	5.22 million MtC
<b>U.S. carbon dioxide savings</b>	19.1 million metric tons
<b>2006 ENERGY STAR Market Penetration</b>	31%
<b>Key Assumptions</b>	<ul style="list-style-type: none"><li>• The price of electricity varies by year and by sector (residential or commercial), ranging between 8.8 and 9.5 cents/kWh during 2006 to 2015.</li><li>• The percentage of stock and new shipments that are ENERGY STAR is assumed to remain constant from 2005 to 2015.</li></ul>

# Incremental Savings for Proposed V2.0 (2006-2015)



- U.S. Energy Savings: 1.5 billion kWh
- U.S. Energy Bill Savings: \$134 million
- U.S. Carbon Savings: 0.27 million MtC



### 3. Brief Discussion/Clarifying Questions from EPA Presentation



## 4. Overview of Comments Received to Date

# Specification Levels



- Draft 1 specification will significantly increase material costs and create technical difficulties
- AC-DC performance requirements “can be met with existing technologies, or where these technologies fail to meet them today the improvements required are small and are expected to be practical in the near future.”
- Threshold or cutoff for 87% average Active efficiency should be 51 watts to harmonize with European requirements, not 36 watts as proposed
- Suggestion that the ENERGY STAR V2.0 specification be identical to the CA Energy Commission’s Tier 2 requirements

# Power Factor



- The power factor requirement in the European regulations begins at 75 watts input power, not 75 watts output power as stated by EPA in Draft 1
- Change power factor requirement to apply to EPSs with 75 watts or greater input power
- Power factor is a function of load. Need a statement requiring the EPS to be tested on the typical loads seen in normal use
- Recommend that power factor requirement be revised to comply with IEC 61000-3-2 for harmonics
- Suggest that power factor only be limited in the same way that harmonic current is limited in EN 61000-3-2
- Typically, there will be a loss in efficiency with the addition of PFC to a power supply and this should be recognized with a slightly lower efficiency limit in the specification

# Ac-Ac Models



- Proposed 0.5 watt maximum No-Load is acceptable for ac-ac supplies up to output power of 15 VA
- 0.75 watt maximum No-Load is feasible for ac-ac models with output power greater than 15 VA and less than or equal to 40 VA
- It is not possible with present technology to meet a maximum No-Load requirement of 0.75 watts for ac-ac supplies with output power greater than 40 VA
- Recommend revising ac-ac specification to only apply to units with an output power  $\leq 40$  VA
- Allow manufacturers of 50-250 watt ac-ac models to subtract power draw from monitoring circuits and LED indicators

# Testing at 115V and 230V



- Consider separate energy efficiency requirements for 115V and 230V
- Testing at 115V and 230V with the lower efficiency used for qualification unduly penalizes any EPS with 115V capability

# Other Comments



- 87% average Active efficiency is particularly challenging for low voltage/high current power supplies; consider changing requirements or provide additional time for R&D
- Ac-dc power supplies with switching technology produce unwanted noise that can affect the clarity of audio signals. Consider allowing ac-dc power supplies that utilize a linear type transformer to meet the No-Load requirements for ac-ac models
- Implement similar specification in two phases (e.g., step 1 in July 2008 and step 2 in 2010)
- Some suggested that EPA delay the Version 2.0 effective date while others supported July 1, 2008
- Integrate language from the proposed change for Imaging and Computers into the EPS specification



## 5. Stakeholder Comments and Discussion



## 6. Timeline and Next Steps

# EPS Specification Revision Timeline



- **June 8, 2007:** Announcement Letter for V2.0 Specification Development
- **October 11, 2007:** Draft 1 V2.0 Specification to Stakeholders
- **November 13, 2007:** Online Meeting with Stakeholders to Review Draft 1
- **November 20, 2007:** Deadline for Draft 1 Stakeholder Comments
- **Dates TBD:** Additional Drafts, as needed
- **July 1, 2008:** Proposed V2.0 Effective Date

# Key Next Steps



## EPA

- Consider verbal comments provided during Online Stakeholder Meeting
- Review all written stakeholder comments
- Coordinate with international and domestic energy efficiency colleagues, as needed
- Develop Draft 2, if appropriate, and share with stakeholders

## Stakeholders

- Test new models and share test data with EPA
- Submit comments to EPA by November 20, 2007

# Stay Informed



Visit ENERGY STAR on the Web at  
[www.energystar.gov](http://www.energystar.gov)

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## 7. Adjourn

Thank you for your comments,  
suggestions, and support.