Breakout Session: Power Supply Requirements

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Goals for the Session

• Evaluate Net Power Loss approach for evaluating power supply losses in operation

• Record feedback on the state of power supply efficiency
  – What levels of efficiency are readily available on the market?
  – What are barriers to further efficiency improvements of PS installed in servers (assuming Tier 1 requirements as baseline)?

• Identify areas not addressed with current approach (efficiency/power factor, single- and multi-output)
  – E.g. Redundancy, multiple power supply systems, etc.
Recap of Tier 1

EPA intends to explore a Net Power Loss approach for Computer Server power supplies under Tier 2 of this specification. This approach would aim to specify a maximum allowed power loss through the power supply at actual operating conditions of the Computer Server (e.g., Idle and full load power).

• Driving factor for NPL approach - current efficiency structure:
  – Current efficiency approach requires power supplies to perform efficiently in power ranges where they may not operate (e.g., 100%), and can give insufficient attention to where they do operate
  – Ignores benefits of right-sizing
  – Ignores impact of redundancy choices (two 85% efficient PSU’s use more energy than one)
  – Fails to address real-world PSU interactions with server
“Net Power Loss” Approach

- Address actual wattage losses at real operating conditions instead of efficiency at arbitrary load conditions

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\text{AC Power}_{\text{in}} - \text{DC Power}_{\text{out}} @ \text{Idle and Max} \quad \text{not} \quad \text{DC Power}_{\text{out}} / \text{AC Power}_{\text{in}} @ 10\%, 20\%, 50\% \text{ and } 100\% \text{ Rated Load}
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| • Directly correlates to wasted wattage / real-world conditions  
• Moves away from arbitrary load points  
• Includes effects of redundancy, PSU sizing, multiple power supplies | • Industry currently understands and does procurement based on efficiency  
• More difficult to measure  
• Would take time to develop |
Feedback from Climate Savers Computing Initiative

Kathleen M. Fiehrer
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Program Manager Climate Savers Computer Initiative

Learn more at energystar.gov
Discussion

• What level of effort will be required to comply with the NPL Calculation and Measurement? Are there implementation issues or concerns the EPA should consider with this approach?

• What is the current level of availability for power supplies meeting the proposed efficiency levels?

• What levels of efficiency are readily available on the market?

• What are barriers to further efficiency improvements of PS installed in servers (assuming T1 requirements as baseline)?

• What areas are not effectively addressed with current approach for efficiency/power factor requirements? What methods might help meet this need?