

565 **3) Efficiency Requirements for Qualifying Products:** A Computer Server must meet all the
 566 requirements provided in Sections 3.A – 3.C, below, to qualify as ENERGY STAR.
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568 **Tier 1 Requirements: Effective May 1, 2009**
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570 **A. Power Supply Efficiency Requirements**

571 All power supplies in Computer Servers must meet the minimum efficiency and power factor
 572 requirements contained in Tables 1 and 2, below.
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575 **Table 1: Efficiency Requirements for Computer Server Power Supplies**

| Power Supply Type | Rated Output Power | 10% Load | 20% Load | 50% Load | 100% Load |
|-------------------------------|--------------------|----------|----------|----------|-----------|
| Multi-Output (AC-DC & DC-DC) | All Output Levels | N/A | 82% | 85% | 82% |
| Single-Output (AC-DC & DC-DC) | ≤ 500 Watts | 70% | 82% | 89% | 85% |
| | 501 - 1,000 Watts | 75% | 85% | 89% | 85% |
| | > 1,000 Watts | 80% | 88% | 92% | 88% |

Table 2: Power Factor Requirements for Computer Server Power Supplies

| Power Supply Type | Rated Output Power | 10% Load | 20% Load | 50% Load | 100% Load |
|---------------------|--------------------|----------|----------|----------|-----------|
| DC-DC (All) | All Output Levels | N/A | N/A | N/A | N/A |
| AC-DC Multi-Output | All Output Levels | N/A | 0.80 | 0.90 | 0.90 |
| AC-DC Single-Output | ≤ 500 Watts | 0.65 | 0.80 | 0.90 | 0.90 |
| | 501 - 1,000 Watts | 0.65 | 0.80 | 0.90 | 0.90 |
| | > 1,000 Watts | 0.80 | 0.90 | 0.90 | 0.90 |

576 **Note:** An important element of holistic design for power conversion is to properly size power supplies to
 577 keep the operating range of the Computer Server in the high efficiency portion of the efficiency curve. EPA
 578 realizes that an unintended consequence of setting levels that are too difficult for lower wattage power
 579 supplies could be for manufacturers to use larger (and potentially oversized) power supplies to meet these
 580 efficiency requirements. This could result in an increase in the total energy used by the server, which is
 581 not EPA's intention.
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584 EPA revisited the dataset to investigate concerns regarding the challenges of low wattage power supplies
 585 to overcome fixed losses and meet the 10% and 20% efficiency levels proposed in the Draft 3
 586 specification. One stakeholder suggested that EPA create a separate category for low wattage power
 587 supplies (≤ 750 Watts) that includes a slight modification to the 20% load requirements and an exemption
 588 from 10% loading requirements. EPA agrees that modified levels are necessary for lower wattage
 589 supplies. Due to the dominance of fixed losses at low loading for smaller supplies, efficiency levels
 590 appear very low when in reality, relatively little power is actually being lost. EPA considered this proposal
 591 and based on further analysis of the data has chosen 500 Watts as the appropriate cutoff for low wattage
 592 products. As a result, a new low wattage bin is proposed in Tables 1 and 2, above, with relaxed
 593 requirements for efficiency at 10% and 20% loads. Based on available data, EPA has set the 20% load
 594 level equal to that of Multi-Output supplies and the 10% load condition efficiency level at 70%. These new
 595 levels represent approximately the top 25% of performers in EPA's data set. Since the challenge of fixed
 596 losses is applicable only to low loading conditions on the power supply, the proposed levels at 50% and
 597 100% loads remain unchanged. EPA has not modified the power factor requirements for these products
 598 because the current levels should be achievable based on EPA's collected data. EPA also realizes,
 599 based on industry discussions, that solutions that aim to further reduce fixed losses at low loads are in
 600 development. Therefore, EPA anticipates moving efficiency levels for all power supplies to the > 1,000
 601 Watt Single-Output levels under Tier 2.

