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June 26, 2018

Mr. Ryan Fogle
US Environmental Protection Agency
Ariel Rios Building 6202J
1200 Pennsylvania Avenue
Washington, D.C. 20460

Dear Mr. Fogle:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to Draft 3, Version 3, ENERGY STAR® Computer Servers Specification, released by the Environmental Protection Agency (EPA) on May 3, 2018.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces. In 2016, CEE members directed nearly $7 billion of the $8.8 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR, so it may continue to serve as the national marketing platform for energy efficiency.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

CEE Supports the Proposed Active Efficiency Metric

CEE thanks EPA for sharing the data, analysis, and assumptions it used as the basis for the Draft 3 proposed active efficiency criteria. We recognize that baseline performance data is unavailable, and we appreciate EPA compiling and sharing all available data directly with stakeholders. This includes the server dataset analyzed in the development of proposed

performance criteria, and the basis for concluding that the dataset is representative of the market. We appreciate efforts EPA made, working with the Information Technology Industry Council (ITI) and The Green Grid (TGG) Server Efficiency Rating Tool (SERT) Working Group, during the development of Draft 3 to make the dataset available to stakeholders as well as engaging stakeholders in review and discussion of this analysis. Based on these discussions and review of the data and analysis EPA provided, CEE accepts the conclusion of ITI and TGG that the proposed active efficiency metric provides a consistent and credible basis for comparing active server efficiency of similar server types and configurations across a common range of tasks typically performed by servers in data center environments.

CEE supports the use of the active efficiency metric as proposed in Draft 3. CEE comments on Draft 2 supported the concept of balancing idle energy limits and active efficiency performance requirements to identify the top quartile of performers. While not a measure of efficiency, idle state power consumption is important because multiple studies have found that a significant portion—ten percent to thirty percent—of installed servers are inactive, operating in idle state continuously.[1,2,3] In March, the SERT Working Group provided analysis demonstrating that the SERT active state tests includes significant time in idle and captures servers' ability to ramp power down with lower levels of server utilization. Given this new information, we support the Draft 3 proposal to set Version 3 performance criteria based solely on active efficiency and to retain idle energy as a reporting requirement.

CEE Requests that EPA Provide Guidance on Energy Savings and Incremental Costs that can be Expected from ENERGY STAR Servers

CEE supports the EPA in its objective to address energy savings opportunities in the computer server market. The provision of cost-effective energy savings to customers without compromising performance is an important principle that guides the ENERGY STAR program in development of specifications. As noted above, we accept the conclusion of ITI and TGG that the proposed active efficiency metric identifies more

[1] "Comatose Server Savings Calculator," The Uptime Institute, accessed September 15, 2017, https://uptimeinstitute.com/resources/asset/comatose-server-savings-calculator.

[2] Jonathan Koomey and Jon Taylor, Anthesis Group, "New data supports finding that 30 percent of servers are 'Comatose', indicating that nearly a third of capital in enterprise data centers is wasted," 2015, accessed September 15, 2017, http://anthesisgroup.com/wp-content/uploads/2015/06/Case-Study_DataSupports30PercentComatoseEstimate-FINAL_06032015.pdf.

[3] Robert McMillan, "Zombie Servers: They're Here and Doing Nothing but Burning Energy," *The Wall Street Journal,* September 13, 2015, accessed September 15, 2017, https://www.wsj.com/articles/zombie-servers-theyre-here-and-doing-nothing-but-burning-energy-1442197727.

efficient servers without compromising performance, but we believe stakeholders would benefit from analysis and disclosure of assumptions used in calculating expected energy savings and the cost-effectiveness to the end user. For example, publicly available market data that indicate the expected retail price difference associated with a more energy efficient server versus its energy inefficient counterpart, could bolster the case for selecting ENERGY STAR. If EPA has concluded that there will be no incremental cost for servers meeting the proposed specification, we encourage EPA to disclose its basis for that conclusion for stakeholder consideration.

We understand that the proposed active efficiency metric provides a basis to compare the efficiency of servers of similar type and configuration, but that active efficiency scores cannot be used directly to estimate energy consumption, and that a methodology such as the Deployed Power Analysis, described in the ITI and TGG comments on Draft 1, is needed to characterize and compare the potential energy use of servers.[4] We encourage EPA to provide consumer facing guidance on interpreting the active efficiency score and using the SERT performance data made available via the qualified products list to characterize expected energy use to the extent practical. EPA is well positioned to provide information on the expected energy savings or range of savings for servers meeting the proposed ENERGY STAR criteria versus their equivalent, non-ENERGY STAR qualifying counterparts, as well as the basis and assumptions used to generate the savings expectation. This information would include significant variables such as configuration and application that impact the actual energy savings or range of savings that can be expected.

CEE Sees an Opportunity to Increase Stringency of Power Supply Efficiency Requirements at Low Load

Available data indicates that a significant portion of servers have low average utilization, suggesting that those servers spend much of the time in idle state not performing work. A 2016 DOE report estimates that most servers are in internal data centers and that these internal data center servers have an average server utilization use between ten percent and fifteen percent. The report also estimates that internal data centers will continue to house over half of all servers, and the volume of servers installed in internal data centers will remain roughly constant from 2016 through 2020.[5] As noted above on page 1, multiple

[4] https://www.energystar.gov/sites/default/files/ITI%20and%20TGG%20Comments.pdf Accessed June 6, 2018.

[5] Arman Shehabi et al., United States Data Center Energy Usage Report (Berkeley, CA: Lawrence Berkeley National Laboratory, June 2016), 10, table 1, "Average active Volume Server Utilization Rates, and 23, fig. 20, 'Total

studies have found that a significant portion—ten percent to thirty percent—of installed servers are inactive, operating in idle state continuously. The dataset shared by EPA includes analysis of power supply unit (PSU) when the server is idle.[6] The data for one and two socket rack and tower servers shows that the average PSU is 15.7 percent for typical configurations and 12.7 percent for low-end configurations. These data suggest a need to reexamine the stringency of the requirements for the ten percent load and twenty percent loads in the Draft 3 PSU requirements.

In their comments on the Draft 2 proposal,[7] NRDC shared analysis comparing the mean of all the Platinum units in the 80 PLUS database as of Summer 2017 (530 units) against the 80 PLUS Platinum requirements, showing that 80-PLUS certified power supplies exceed requirement by 5.26 percent at ten percent load and 2.7 percent at twenty percent load. For reference, we've included this analysis below.

Table 1. **Efficiency of 80-PLUS Platinum PSUs vs. 80-PLUS Requirements**

Load:	10%	20%	50%	100%
Platinum req. (single-output)	83.00	90.00	94.00	91.00
Mean	88.26	92.71	94.38	92.78
Difference of mean to Platinum requirement	5.26	2.71	0.38	1.78

This analysis indicates an opportunity to set more stringent requirements at the ten percent and twenty percent load levels. If EPA sees benefit in supporting performance levels that are equivalent to those of 80 PLUS, we encourage EPA to work with the 80 PLUS program to develop PSU efficiency requirements that are more stringent at the low load levels typically experienced by computer server PSUs.

CEE would once again like to thank the EPA for the opportunity to comment on the Draft 3 Version 3 ENERGY STAR Computer Servers Specification. Please contact CEE Program Manager Bjorn Jensen at 617-337-9280 with any questions about these comments.

Server Installed Base by Data Center Space Category." LBNL-1005775, accessed June 6, 2018, https://eta.lbl.gov/publications/united-states-data-center-energy.

[6] EPA "ENERGY STAR Computer Servers Draft 3 Version 3 Data and Analysis Package" "Metric Analysis (A,C)" tab, columns QL-QT. Accessed June 6, 2018 https://www.energystar.gov/sites/default/files/asset/document/SERT_2012%20Plus%20SERT%202.0.0%20converted_03232018_public_0.xlsx

[7] NRDC comments regarding Draft 2 Version 3.0 Specification for Computer Servers, 2017, https://www.energystar.gov/sites/default/files/NRDC%20Comments_8.pdf. Accessed June 26, 2018

Sincerely,

Ed Wisniewski
Executive Director