September 15, 2017

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 2 Version 3.0 ENERGY STAR® Computer Servers Specification, released by the Environmental Protection Agency (EPA) on July 31, 2017.

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 2015, CEE members directed nearly $7 billion of the $8.7 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. We appreciate the opportunity to provide these comments.

According to Lawrence Berkeley National Laboratory (LBNL), computer servers will consume approximately thirty-five terawatt hours of electricity in 2017, or almost one percent of total US electricity consumption.1 Computer servers are technically complex products, and the data center industry is diverse, dynamic, and rapidly innovating. The technical complexity, rapid innovation, and short useful life of server technology (to our understanding, approximately four years) make it challenging for energy efficiency program administrators to incorporate efficiency measures for servers into their portfolios. Given these challenges, only a few CEE members offer

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prescriptive programs for servers. If available, program administrators would benefit from additional market intelligence on computer server refresh rates in different market segments, particularly segments with refresh rates of five years or longer.

**While EPA and Industry Have Developed a Tool to Benchmark Server Performance, Additional Analysis and Summary of the Data is Needed to Demonstrate Energy Performance is Accurately Represented**

In response to a request from EPA, the server industry via the Standard Performance Evaluation Corporation, or SPEC released a software tool, the Server Efficiency Rating Tool, or SERT, that rates the performance and energy efficiency of single- and multi-node servers across a broad span of configurations. Server testing using SERT has been a mandatory part of the ENERGY STAR Computer Server Specification since 2013, with test results made publicly available through an ENERGY STAR Server qualified products list. It is our understanding that EPA has collaborated with ENERGY STAR server partners and SPEC to collect and analyze server performance data to determine how to most appropriately set active efficiency requirements in the draft ENERGY STAR Computer Server Specification. We applaud EPA for taking on the challenge to develop a tool that can be reliably used to benchmark server performance. If the EPA analysis of server data is capable of representing active server energy performance in a reliable, consistent, and credible manner, we would find it of great value. However, thus far we have seen an insufficient basis for belief that this is so. We look forward to reviewing the EPA dataset and supporting analysis when made public later this year, and may have additional comments at that time.

CEE supports the EPA in its objective to address energy savings opportunities in the enterprise computer server market. Draft 2 represents that the proposed idle energy and active efficiency requirements target the top quartile of the market. However, the underlying data has not been revealed that demonstrates that servers meeting the Draft 2 Version 3.0 Specification would provide cost-effective energy savings to customers without compromising performance or negatively impacting manufacturers or end users. We understand that this principle is intended to guide the ENERGY STAR program in the development of specifications. While SERT results may indicate performance, no supporting evidence such as data or supporting analysis is provided in the draft specification. CEE requests that EPA share the data, analysis, and assumptions it used as the basis for the Draft 2 proposal. 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 understand that the underlying dataset is large

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2 Based on a recent survey of CEE member programs, only three CEE members offer prescriptive incentives for servers.
and complex and that EPA is working to convert the dataset into a format that can be shared publicly. In addition, the following information is requested:

- Expected energy savings or range of savings for servers meeting the proposed ENERGY STAR criteria versus their equivalent, non-ENERGY STAR qualifying counterparts, the basis and assumptions used to generate the savings range, and significant variables such as configuration or application that impact the actual energy savings or range of savings that can be expected. Draft 1 Comment Response Document references national energy savings for ENERGY STAR servers in the conclusion of Version 3.0 development.
- Basis for estimates of the relative market share of products meeting the proposed ENERGY STAR Specification versus the overall server market, such as national unit shipment data or other relevant data used to develop this proposal. Program administrators who wish to propose server programs to their regulators typically need market share data to characterize the cumulative savings potential and to demonstrate that the efficiency measure is not standard practice.
- Publicly available market data that indicate the expected retail price difference associated with a more energy efficient server versus its energy inefficient counterpart, for example, prices as published in catalogs. Program administrators desiring to support ENERGY STAR servers through their programs typically require this information to determine potential payback periods.

**CEE Supports the Concept of Balancing Idle Energy Limits and Active Efficiency Performance Requirements to Identify Top Performers**

In theory, CEE supports the EPA approach to balance idle energy and active efficiency performance requirements in order to identify the top 25 percent of performers in the market. Servers are purchased to perform work critical to business operations in data centers and office environments. Active efficiency represents the efficiency with which a server does the work for which it was purchased. Therefore, active efficiency is important from a customer and societal energy efficiency perspective. While not a measure of efficiency, idle state power limits are also important to lowering server energy use. Multiple studies have found that a significant portion—ten percent to thirty percent—of installed servers are inactive, operating in idle state continuously.  

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estimates that average server utilization rates range from ten percent to fifteen percent in internal corporate-owned data centers.⁶ For these reasons, we support retaining idle energy limits with appropriate allowances for additional memory and other components typically used in servers configured for virtualization hosts and in cloud platforms.

**CEE Thanks EPA for Reducing the Idle State Efficiency Adder Limits for Additional Memory Above 4GB of Installed Memory to 0.125 W/GB**

CEE thanks EPA for reducing the idle state efficiency adder limits for additional memory above 4GB of installed memory from 0.25 W/GB to 0.125 W/GB. CEE understands that Natural Resources Defense Council (NRDC), a CEE member, is developing a recommendation to further reduce adder limits for additional memory above 4GB and will be sharing their recommendation, data, and analysis later in September. CEE will review the NRDC assessment of the opportunity to reduce the additional memory allowance further.

**Consider Giving Greater Weight to Low Load Points in Power Supply Efficiency Requirements**

Reports of low average server loads in the field raise questions regarding the stringency of the ten percent load and twenty percent load efficiency requirements in the Draft 2 power supply requirements. For example, the 2016 DOE report cited above estimates that a majority of servers are in internal data centers and assumes average server utilization for these internal data center servers to be between ten percent and fifteen percent. While the report estimates that the share of servers in hyperscale (servers found in large colocation and cloud data centers) is expected to increase rapidly from 2016 to 2020, it 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.⁷ If EPA has similar assumptions regarding the server market and operations, increasing the efficiency requirements for single output power supply units (PSUs) at ten percent and twenty percent load above the current levels of 83 percent and 90 percent efficiency, respectively, is worthy of consideration. Similarly, adding an efficiency requirement at the ten percent load point is worth consideration for multi-output power supply units.

CEE intends to review additional data and analysis on this topic from NRDC and may forward additional comments to EPA before the conclusion of the revision process.

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⁷ Ibid., 10, table 1, “Average Active Volume Server Utilization Rates”, and 23, fig. 20, “Total Server Installed Base by Data Center Space Category.”

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CEE would once again like to thank the EPA for the opportunity to comment on the Draft 2 Version 3.0 ENERGY STAR® Computer Servers Specification. Please contact CEE Program Manager Bjorn Jensen at 617-337-9280 with any questions about these comments.

Sincerely,

Ed Wisniewski
Executive Director