May 3, 2019

Mr. Ryan Fogle
ENERGY STAR Program – Product Labeling
U.S. Environmental Protection Agency
Ariel Rios Building 6202J
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Subject: Version 8 ENERGY STAR Computer Specification Draft 1 Comments

Dear Mr. Fogle:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the United States (U.S.) Environmental Protection Agency's (EPA) request for further information on desktop computer categorization.

The signatories of this letter, collectively referred to herein as the California Investor Owned Utilities (CA IOUs), represent some of the largest utility companies in the Western U.S., serving over 32 million customers. As energy companies, we understand the potential of appliance efficiency standards to cut costs and reduce consumption while maintaining or increasing consumer utility of the products. We have a responsibility to our customers to advocate for standards that accurately reflect the climate and conditions of our respective service areas, so as to maximize these positive effects.

We appreciate this opportunity to provide comments to EPA as it develops the ENERGY STAR ® Computer Specification Version 8. This letter outlines comments regarding Draft 1 of the specification.

The CA IOUs supports the EPA's efforts to recognize efficient computers on the market, and generally support the updates proposed in Draft 1 Version 8.0. In particular, we support:

- **Increased stringency for desktops and integrated desktops –** EPA estimates that the market penetration of ENERGY STAR qualified desktops under the Version 7.1 Specification is 52 percent. EPA's proposed base allowances increase stringency and better characterize efficient systems on the market today.
- **Eliminating incentives for Energy Efficient Ethernet (EEE)** – The EEE incentive was put into place to encourage the adoption of this energy-saving technology on Ethernet ports. EPA data shows that the market has broadly adopted EEE, and the incentive is no longer necessary.
- **Removing Full Network Connectivity mode weightings** – The CA IOUs agree with EPA that the proposed mode weightings eliminate the need for separate mode weightings for Full Network Connectivity.

The CA IOUs have noted some areas to improve the specification. Our key recommendations are summarized below, followed by more detailed discussion:

## Summary Recommendations

1. **Add a ten percent load efficiency requirement for internal power supplies –** As a compromise between stakeholder proposals on power supply efficiency, the CA IOUs recommend that EPA adopt an efficiency requirement at ten percent load. The ten percent load efficiency is already measured by 80 PLUS and is closer to actual system load points than the lowest point of 20 percent proposed by EPA. CA IOU analysis below shows significant spread in that metric across systems in the EPA dataset, indicating a savings opportunity that would be missed without including a low-load point.

2. **Align discrete graphics adder to the California Energy Commission (CEC) Appliance Efficiency Regulations (Title 20) for computers Tier II level** – Although we appreciate harmonization in the structure of ENERGY STAR requirements with the CEC Title 20 computers regulation, EPA should set requirements that are more stringent than mandatory standards and lead the market rather than follow it. Instead of using the proposed Title 20 computers Tier I adder for discrete graphics, which is the standard in California today, EPA should adopt the Title 20 computers Tier II adder.

3. **Adopt a memory adder that is more stringent than the CEC Title 20 computer adder** – For memory greater than about four GB, the EPA's proposed memory adder is less stringent than the CEC Title 20 computer memory adder. We recommend EPA adopt a memory adder that is 20 percent more stringent than the CEC Title 20 adder.

4. **Adjust adders to appropriate levels for new mode weightings** – The new mode weightings decrease the amount of time systems are assumed to spend in short and long idle. ENERGY STAR adders from previous versions of the specification or the CEC Title 20 computer regulation should reflect this change, and be decreased in the same proportion as the idle mode weightings.

## Detailed Recommendations Discussion

1. **EPA should add a ten percent load efficiency requirement of 83 percent for internal power supplies**

   The CA IOUs agree with EPA that there is "value in addressing low load power supply efficiency as it is the operating condition desktop computers spend a majority of their time in while turned on according to the latest desktop mode weighting data…".[1] EPA proposes to do so by setting efficiency requirements equivalent to 80 PLUS Gold requirements at 20, 50, and 100 percent based on the reasoning that 80 PLUS Gold power supplies exhibit better five percent load efficiency than Bronze power supplies. Although this is true for 80 PLUS supplies, EPA has not shown this to be true for models that are not certified by 80 PLUS. In addition, if EPA assumes that efficient performance at high load leads to efficient performance at low loads, rather than requiring a direct measurement, EPA will not capture the actual low-load performance of power supplies and systems.

   The CA IOUs and the National Resources Defense Council have previously recommended an efficiency requirement at five percent load, while industry stakeholders have objected to increasing test burden. As a compromise, EPA should include an efficiency requirement at ten

[1] ENERGY STAR Program Requirements, Product Specification for Computers Eligibility Criteria, Draft 1, Version 8.0, p.8. https://www.energystar.gov/sites/default/files/Version%208.0%20Computers%20Draft%201%20Specification.pdf

percent load, a measurement that has been collected by 80 PLUS since 2012 and is already routinely reported to ENERGY STAR for systems to qualify for the internal power supply efficiency allowance.

As shown in **Error! Reference source not found.**, power supplies can operate at wide range of efficiencies at ten percent load, even those that meet 80 PLUS Gold requirements. To begin to encourage low-load efficiency, we suggest that EPA include a ten percent load requirement of 83 percent in the ENERGY STAR Computer Specification Version 8.0. This would encourage low-load efficiency for no additional test burden so long as manufacturers generally use 80 PLUS certified power supplies. Consumers would benefit from not only better efficiency, but also from the generally better quality of power supplies that perform well at low load points. This requirement would reduce compliance of systems in the EPA data package by about two percent.

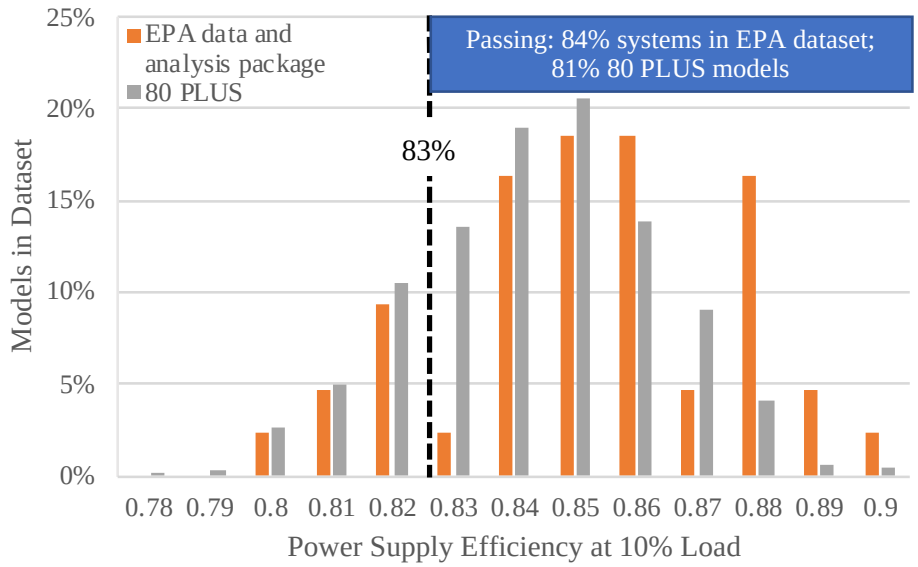


**Figure 1: Internal power supply efficiency at ten percent load.**
Source: CA IOU analysis of EPA data and analysis package[2] and 80 PLUS Gold certified power supplies.[3]

2. **EPA should align the discrete graphics adder to CEC Tier II level.**

The CA IOUs support the EPA's proposal of aligning the discrete graphics adder to that in the CEC Title 20 regulation. EPA proposes the CEC Tier I discrete graphics adder, a standard requirement that is already in place. We recommend instead that EPA use the CEC Tier II level, so that ENERGY STAR recognizes discrete graphics cards that are more efficient than those that meet California standards. Including this change decreases pass rate of the systems in the data and analysis package by about five percent.

[2] EPA data and analysis package for Computers Specification Version 8: https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%208.0%20Computers%20Draft%201%20Specification%20Data%20Analysis%20Package.xlsx
[3] 80 PLUS certified power supplies: https://www.plugloadsolutions.com/80PlusPowerSupplies.aspx

3. **EPA should adopt a memory adder that is more stringent than the CEC Title 20 adder.**

The EPA memory adder should be more stringent than the current mandatory standard in California. EPA's proposed adder is more stringent than CEC's for memory capacity of 11 GB and less, less stringent for systems with more than 11 GB or memory capacity (**Error! Reference source not found.**). The CA IOUs recommend an adder equal to either the EPA proposal, or 20 percent less than the CEC Title 20 adder, whichever is lower for a given capacity. This yields a memory adder equal to the EPA's proposed adder for memory capacity of five GB and less, and 20 percent more stringent than the CEC Title 20 adder for memory capacity greater than five GB. This adjustment would decrease pass rates of systems in the EPA's data package by about nine percent.

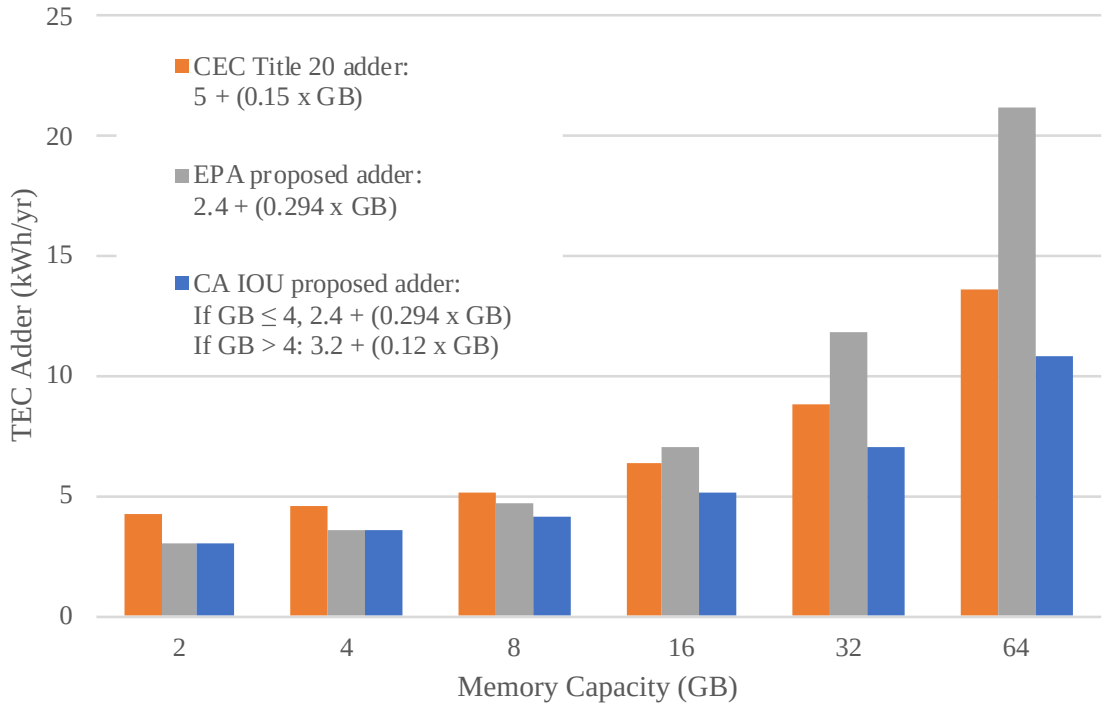


**Figure 2: Comparison of memory adders for a various memory capacities.**
Source: CA IOU analysis.

4. **EPA should adjust adders to appropriate levels for new mode weightings.**

EPA's proposed mode weightings reduce idle mode weightings from previous levels of 35 percent and 15 percent of time spent in short and long idle, respectively, to 30 percent and 10 percent. Adders give additional allowances to systems with functions that operate in idle modes and were developed to accommodate systems based on the previous mode weightings. Therefore, adders should be adjusted proportionally to the new idle mode weighting.

For example, the proposed display adder is based on a display mode weighting of 35 percent on, 65 percent sleep time:[4]

[4] ENERGY STAR Program Requirements, Product Specification for Displays Eligibility Criteria, Final Draft, Version 8.0, p.7, Equation 1. https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Displays%20Final%20Draft%20Version%208.0%20Specification.pdf

$$E_{TEC\_old} = 8.76 \times (0.35 \times P_{ON} + 0.65 \times P_{SLEEP}) \quad (1)$$

where $E_{TEC\_old}$ is the annual energy use of the display using the previous mode weightings, $P_{ON}$ is display on mode power, and $P_{SLEEP}$ is display sleep mode power. In an integrated display, this translates to an active display in short idle 35 percent of the time. Adjusting the adder to EPA's proposed mode weightings changes Equation 1 to:

$$E_{TEC\_new} = 8.76 \times (0.30 \times P_{ON} + 0.70 \times P_{SLEEP}) \quad (2)$$

where $E_{TEC\_new}$ is the annual energy use of the display using EPA's proposed mode weightings. Assuming the display's sleep mode power is small relative to its mode power, the sleep energy use terms in Equations 1 and 2 may be ignored and the ratio of the new adder to the old adder is approximately:

$$\frac{E_{TEC\_new}}{E_{TEC\_old}} = \frac{0.30}{0.35} = 86\% \quad (3)$$

Thus, to scale the display adder to the new mode weightings, it should be reduced by 14%. Similarly, adders that align with the CEC Title 20 computer regulation (memory, graphics, and storage) are based on mode weightings in version 6.1 of the ENERGY STAR Computer Specification, and should be adjusted to the proposed weightings.

Once the memory and graphics adders are made more stringent (Recommendations 2 and 3) and all adders are adjusted for the new mode weightings (Recommendation 4), EPA may find that the base allowances must be adjusted to achieve acceptable pass rates. Specifically, decreased adders may lead to the need to increase the proposed base allowances. This may be fairer to low performance systems that do not benefit from adders, while ensuring that higher performance systems deliver their increased functionality in an efficient manner.

The CA IOUs thank EPA for the opportunity to be involved in the ENERGY STAR Computer Specification Version 8 revision process, and we look forward to discussing how the suggestions above may be incorporated into the next draft.

Sincerely,

Patrick Eilert
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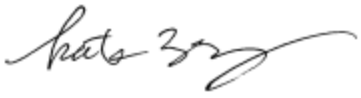
Pacific Gas and Electric Company



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