



November 3, 2017

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: Draft 2 of Version 7 ENERGY STAR® Computer Specification

Dear Mr. Fogle:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SoCalGas®), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the U.S. Environmental Protection Agency's (EPA) Version 7, Draft 2 ENERGY STAR® Computer Specification.

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 United States, serving over 35 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 about the second draft of the Version 7 specification. The ENERGY STAR® program has made important and constructive improvements in this draft, including clarification on the application of the Full Network Connectivity duty cycle and associated requirements, increased efficiency requirements for internal power supplies over 500 watts (W) in size, and stronger Energy Efficiency Ethernet (EEE) incentive requirements. **However, several of the definition changes made in draft 2 in the interest of harmonization with the California Energy Commission (CEC) may have unintended consequences that may weaken the standard.** The CA IOUs are specifically concerned about changes to the definitions of workstations and discrete graphics. Consistent with past and current input provided to the CEC, our comments to ENERGY STAR suggest slight modifications to wording that maintain clarity and stringency.

While we acknowledge EPA's intent to mainly address considerations for notebook computers with this version of the specification, our comments also address issues that are relevant to desktop computers. We encourage EPA to move forward as expeditiously as possible with Version 7 revisions so that work on Version 8 can commence, thereby addressing significant changes that may be required for desktops. The CA IOUs continue to encourage EPA to consider adopting new, expandability-based categories for desktops, and to extend desktop power supply efficiency requirements to lower load fractions, which are more typical of today's computer usage. Based on EPA's public statements, we understand that such requirements will not be fully addressed until Version 8; however, it is critical that ENERGY STAR begin gathering the necessary data today to help inform future policy decisions.

Below, we organize our comments based on their applicability to Version 7 and Version 8. In the case of our Version 8 comments, there are important reporting requirements that should be added in Version 7 to lay the groundwork for successful specification development in the future.

Version 7 Comments

1) We recommend refinements to the discrete graphics definition to avoid unintended consequences that may result from changes introduced in draft 2.

ENERGY STAR's draft 2 definition for discrete graphics has been simplified to eliminate the requirement that discrete graphics processing units (GPU) be packaged separately from the central processing unit (CPU). This decision not only weakens the definition of discrete graphics (components that receive significant total electricity consumption (TEC) allowances in the proposed specification), but also the product definition for workstations, which directly references discrete GPUs. The CA IOUs understand the need to maintain flexibility in product definitions to avoid stifling innovations that may ultimately provide efficiency advantages; however, in the case of discrete graphics, we are concerned that the draft 2 definition could have unintended consequences that may ultimately weaken the specification.

Discrete graphics have traditionally been distinguished from integrated graphics based on physical separation, namely the fact that they are located on a separate add-in card. This distinction is not arbitrary. By locating a GPU on a separate card, manufacturers are free to implement higher performance solutions with greater bandwidth, throughput, and thermal design power (TDP, often in the hundreds of watts) than solutions located in close proximity to the CPU. ENERGY STAR and other jurisdictions have recognized the amenity afforded by discrete GPUs and have granted them TEC allowances accordingly.

When a GPU can be packaged alongside a CPU, this signals that the product can be operated in a significantly tighter thermal envelope. In effect, any GPU that can be packaged alongside a CPU is inherently capable of greater efficiency than traditional discrete GPUs and, therefore, should not receive equivalent treatment as discrete products. Due to tighter CPU-GPU integration, packaged GPUs should also be capable of the various power-saving techniques employed by integrated graphics, including panel self-refresh and switchable graphics.

For these reasons, the CA IOUs recommend that ENERGY STAR revert to its original, draft 1 definition of discrete GPUs. Alternately, ENERGY STAR could create a new category of graphics called "packaged graphics," distinct from both integrated and discrete graphics. A packaged GPU is packaged on the same die/substrate as the CPU and has a dedicated local memory controller and dedicated graphics memory. TEC allowances for packaged GPUs would be set at the same levels as for switchable graphics, namely half of the adder for a G1 discrete graphics solution in desktops (no adder in notebooks). This option would provide flexibility for GPU innovation, while maintaining the stringency of existing product definitions like workstations that refer to traditional discrete graphics.

2) We recommend a modification to the revised workstation definition to ensure meeting EPA's goal that high-end desktops are not misconstrued as workstation products.

ENERGY STAR's draft 2 language adopted, almost verbatim, the California Energy Commission's (CEC) definition of workstations. While the IOUs support policy harmonization

where practical, we recommend important modifications to further distinguish workstations from high-end desktops. As noted in comments to the Energy Commission on October 24, 2016, the following optional criteria regarding PCI Express (PCIe) lanes¹ is one that most desktops are capable of meeting:

- b) Supports four or more lanes of PCI-express, other than discrete GPU, connected to accessory expansion slots or ports where each lane has a bandwidth of 8 gigabits per second (Gb/s) or more.

A variety of small form factor ports used in desktops and notebooks could satisfy this requirement, including M.2 and Thunderbolt 3. For this reason, we recommend that EPA adopt the following language, as originally suggested to CEC:

Includes four or more PCI-Express (PCIe) slots, other than discrete graphics, connected to accessory expansion slots or ports, one of which must support at least 16 PCIe lanes, where each lane has a bandwidth of 8 gigabits per second (Gb/s) or more.

Version 8 Comments

- 3) We recommend that EPA lay the groundwork for future desktop computer category approaches by beginning a desktop computer data collection effort now that includes product expandability attributes.**

Although EPA has publicly expressed that it will not address desktop computer categories in Version 7, the CA IOUs recommend that data collection begin now to address this important consideration as early as possible in the Version 8 revision. EPA could require mandatory reporting of desktop computer expandability attributes as part of its certification process for new models, but this would only capture attributes of qualifying systems and would be available in a few years. To ensure a robust and representative dataset to inform the Version 8 development, we recommend that EPA initiate a call for desktop computer data concurrent with the Version 7 revision process.

The CA IOUs recommend capturing, *at a minimum*, the attributes required under upcoming CEC Title 20 Regulations.

- 4) We recommend that EPA lay the groundwork for potential future low-load power supply efficiency requirements by requiring reporting of power supply efficiency at new low-load points.**

The CA IOUs continue to support the long-term development of low-load efficiency requirements for computer internal power supply units (PSU). As demonstrated by the Electric Power Research Institute's (EPRI) data submission in support of the California rulemaking, over half of the power consumed in idle and active modes can be lost in the PSU at low loads (we consider loads below the 10 percent condition to be "low load"),² but ENERGY STAR's current PSU requirements only cover as low as the 20 percent load point, which equates to more than 40 W of direct current (dc) output in a typical desktop PSU, and is beyond the typical idle range of most systems.

While we acknowledge that such requirements may not be added until Version 8, EPA can take important steps to lay the groundwork during Version 7. First, EPA should work with key industry stakeholders and

¹ PCIe lanes are individual busses for data transfer that can be arranged in parallel for increased speeds in high-bandwidth applications.

² http://docketpublic.energy.ca.gov/PublicDocuments/14-AAER-02/TN210102_20160130T110353_Douglas_McIlvoy_Comments_Results_from_laboratory_testing_for_th.pdf

the 80 PLUS program to identify appropriate, standardized low-load test points for mainstream desktop PSUs (specified either in terms of an absolute wattage or as a percentage of the PSUs rated dc output) and any associated instrumentation requirements that may be necessary. Second, EPA should begin collecting PSU efficiency data at these new low-load conditions as part of its desktop certification process or as part of a separate Version 8 data collection effort that runs in parallel with the Version 7 specification development process.

5) We continue to recommend that EPA explore additions to its test procedure to more accurately reflect real-world idle and light active mode use.

The CA IOUs conducted research and testing that demonstrates that ENERGY STAR's current test procedure for long and short idle does not reflect real-world usage.³ More recent research supported by the United Kingdom, and Super-efficient Equipment and Appliance Deployment (SEAD) initiative found that ENERGY STAR 6.1 and ECMA 383 may dramatically underestimate the influence of active mode and called for additional research to identify more appropriate duty cycle assumptions and test methods.⁴ We encourage EPA to include more realistic idle mode and "light" active mode testing in its Version 8 specification.

In conclusion, we would like to reiterate our support to EPA for revisiting the test procedures and voluntary standards for computers. We thank EPA for the opportunity to be involved in this process and encourage EPA to carefully consider the recommendations outlined in this letter.

Sincerely,



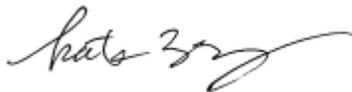
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³ http://docketpublic.energy.ca.gov/PublicDocuments/14-AAER-02/TN211731_20160606T163325_California_Investor_Owned_Utilities_Comments_California_Investo.pdf

⁴ <http://www.superefficient.org/~media/Files/Computer%20efficiency%20report/SEAD%20Report%20-%20Task%20-%20-%20Final.ashx>