August 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 1 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 1 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 first draft of the Version 7 specification. While we acknowledge EPA's intent to mainly address considerations for notebook computers with this version of the specification, our comments address issues that are relevant to desktop computers as well. 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. Per our January 2017 comment letter, 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.

We also recommend that the ENERGY STAR program address issues related to memory allowances for both desktops and notebook computers. Analysis by the CA IOUs indicates that computer manufacturers commonly certify their systems using maximum technically achievable memory installations that are not representative of retail systems. Configurations reported in the Certified Product List (CPL) contain 2, 4, even 16 times the capacity of memory offered to consumers. Since ENERGY STAR's memory adders are capacity-based (on a kWh/yr/GB installed basis), this greatly inflates the allowance that products receive. This could easily be corrected by modifying certification requirements to ensure that representative models are actually offered for purchase through normal retail channels.

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 that EPA address oversights in its memory adder and model certification approach to ensure that certified model configurations reflect those that are available for sale.

EPA's Draft 1 specification maintains a capacity-based approach for memory TEC allowances. Desktop computers are afforded a 0.8 kWh/yr/GB allowance and notebooks a 0.4 kWh/yr/GB allowance. Though relatively innocuous in appearance, the structure of this memory adder combined with current certification requirements has resulted in unintended adverse consequences. Analysis of the Version 6.1 CPL shows that the memory installed and reported in CPL configurations is almost always significantly higher than the capacities available in retail configurations. As a result, manufacturers are able to claim large TEC allowances for memory configurations that consumers cannot directly purchase.[1]

Through collaboration with Natural Resources Defense Council (NRDC) and analysis of its draft Desktop Expandability Dataset, we have documented the extent to which this problem affects certified desktop models. NRDC's Desktop Expandability Dataset provides additional hardware attributes for product families certified since 2015 from manufacturers Dell, HP, Lenovo, Apple, Asus, Acer, and MSI. As shown in Figure 1, over 90% of the product families we surveyed were certified with significantly more installed memory — anywhere from 2 to 16 times more — compared to matching configurations available at retail.[2] In most cases it is impossible to find products that ship with the amount of memory reported in the CPL. This can result in over 40 kWh/yr of additional TEC allowances in desktops, depending on the size of the memory gap, with systems receiving on average about 10% additional TEC allowance.

We note that this additional allowance is not a determining factor for meeting the TEC requirements in any of the systems we have examined to date. Rather, it makes the specification far more lenient in practice than it should be, and this effect could become a significant factor in qualification in the future as other aspects of the specification are tightened if it is not addressed. We have only examined the issue of hardware over-reporting as it relates to installed memory, but the issue could conceivably manifest itself in other areas of the specification where hardware-based adders are granted.

[1] It would be theoretically possible for a consumer to upgrade given models to the memory capacities listed in the QPL by installing additional memory after purchase.

[2] NRDC's dataset contains hardware information on 62 product families and 437 desktop computer configurations. The additional hardware attributes are derived from retail systems that fall within a certified product family. In many cases, there are many configurations that could fall under a certified family. For this analysis, we only retained configurations that most closely reflect the "Representative Model" tested for each category in a product family, resulting in a total of 87 configurations.

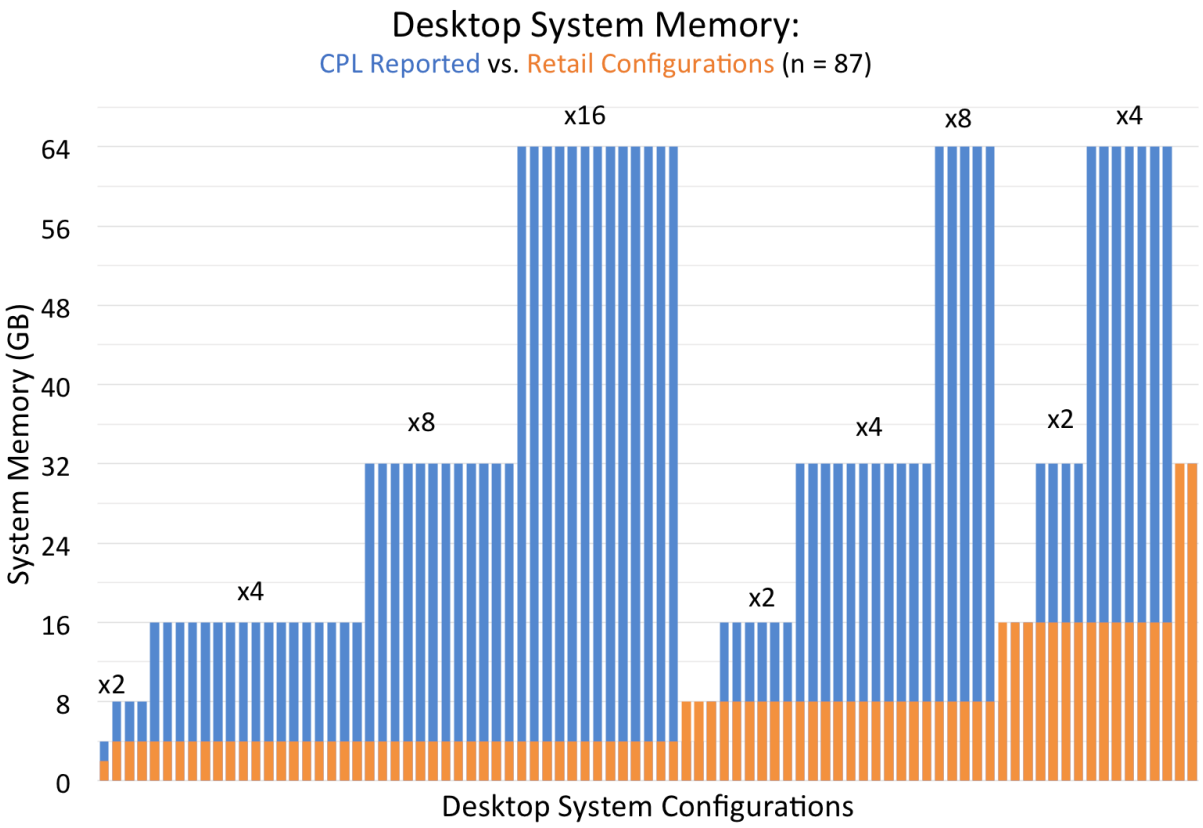

Figure 1: Analysis of 87 desktop configurations show most systems reporting 2 to 16 times the amount of memory available in retail configurations

Additional research by the CA IOUs suggests that the memory over-reporting issue may be present in certified notebooks as well. Since we do not have a matched retail dataset for notebooks, such as the one developed by NRDC for desktops, we have used broad market analysis to examine the issue. Figure 2 provides a distribution of memory configurations for Version 6.1 certified notebooks compared to memory configurations currently available from Dell and HP (based on models currently listed on their websites). Systems in the ENERGY STAR CPL skew significantly toward larger memory configurations (most systems report more than 8 GB of installed memory) compared to those available through manufacturers' online storefronts.

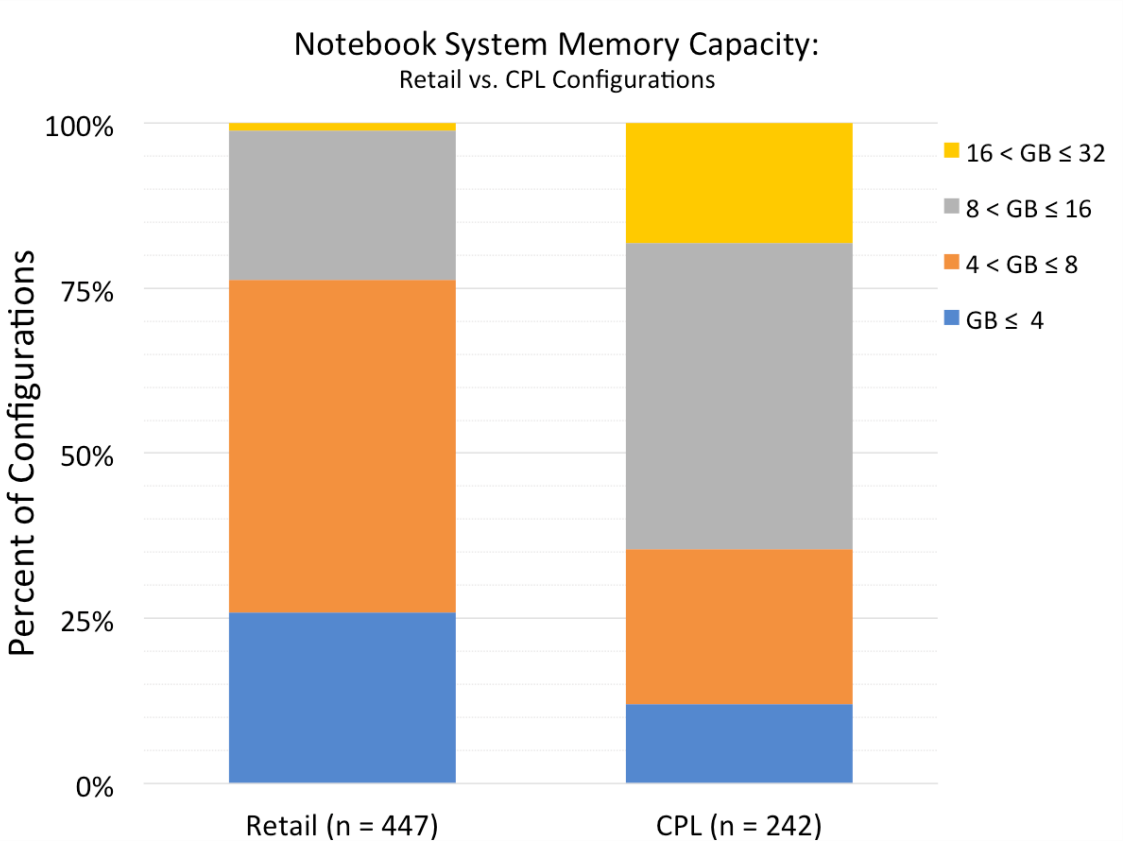

Figure 2: Installed memory capacity in retail and CPL configurations

The CA IOUs firmly believe that TEC requirements for ENERGY STAR product families should be based on hardware configurations that are actually available for purchase by consumers. This reflects the spirit of the ENERGY STAR program itself by providing consumers with transparent and accurate information to motivate more energy-efficient purchasing decisions. We recommend that EPA adjust its certification requirements to ensure that the language in Version 7 is unequivocal on this issue.

Current language on certification of a "Product Family" (section 4.2.1) instructs manufacturers to certify "Representative Models" and that "product configurations that represent the worst-case power consumption for each product category within the family are considered Representative Models." We recommend that EPA further clarify that a Representative Model must be available for purchase through retail channels in applicable locales/markets in the *exact* configuration certified.

2) We recommend that EPA simplify and clarify its approach in dealing with network-connected low power modes, such as Microsoft's Modern Standby and Apple's Power Nap.

The CA IOUs support EPA's efforts to promote low power modes that maintain a device's network presence with minimal power draw and encourage continued dialogue with hardware and software vendors to realize this long-term goal. We particularly appreciate EPA's ongoing conversations with industry on how best to accommodate future network-connected low power states, such as Microsoft's Modern Standby and Apple's Power Nap. However, we are concerned that the current Draft 1 language is ambiguous on how these new power states may be handled.

Section 3.5.1(iii) describes criteria that must be met in order for manufacturers to utilize the "Network Proxy – Full Capability" mode weighting, described in Table 3 of the draft. In addition to requiring that products comply with the ECMA 393 proxy standard, the language requires that sleep power be maintained at or below 2 W while providing full network connectivity. However, on the following page in section 3.5.1(iv), EPA describes a set of requirements whereby products with an "alternative low power mode" (i.e. one that does not conform to the definition of "System Sleep Mode" defined in section 1(D)(4)) are allowed to utilize the alternative low power mode in place of sleep mode as long as its power is no greater than 10 W. The language is unclear on exactly how an alternative low power mode is defined, so we assume that a network-connected sleep mode could be treated as such.

Since the CA IOUs and other stakeholders are currently not privy to the data shared with EPA by industry on network-connected low power modes, it is difficult to judge whether network-connected modes like Modern Standby and Power Nap will be able to achieve EPA's stated 2 W target for sleep modes with full network connectivity. However, the alternative low power mode provisions described above could provide an effective "safety valve" for Modern Standby/Power Nap systems to still comply with ENERGY STAR requirements even if they cannot achieve the 2 W target. Choosing to treat Modern Standby or Power Nap as an alternative low power mode would mean forgoing the Full Network Connectivity mode weighting, but would not significantly penalize systems. As Figure 3 illustrates, there is significant incentive to control sleep power to below 2 W by taking advantage of the Network Proxy – Full Capability mode weighting. If that cannot be achieved, there would be a small TEC jump of about 5 kWh/yr for systems with sleep power immediately above 2 W due to the Conventional mode weighting. Assuming a given system could afford the initial 5 kWh/yr difference in TEC, though, there is relatively little incentive to maintain sleep power lower than 2 W.

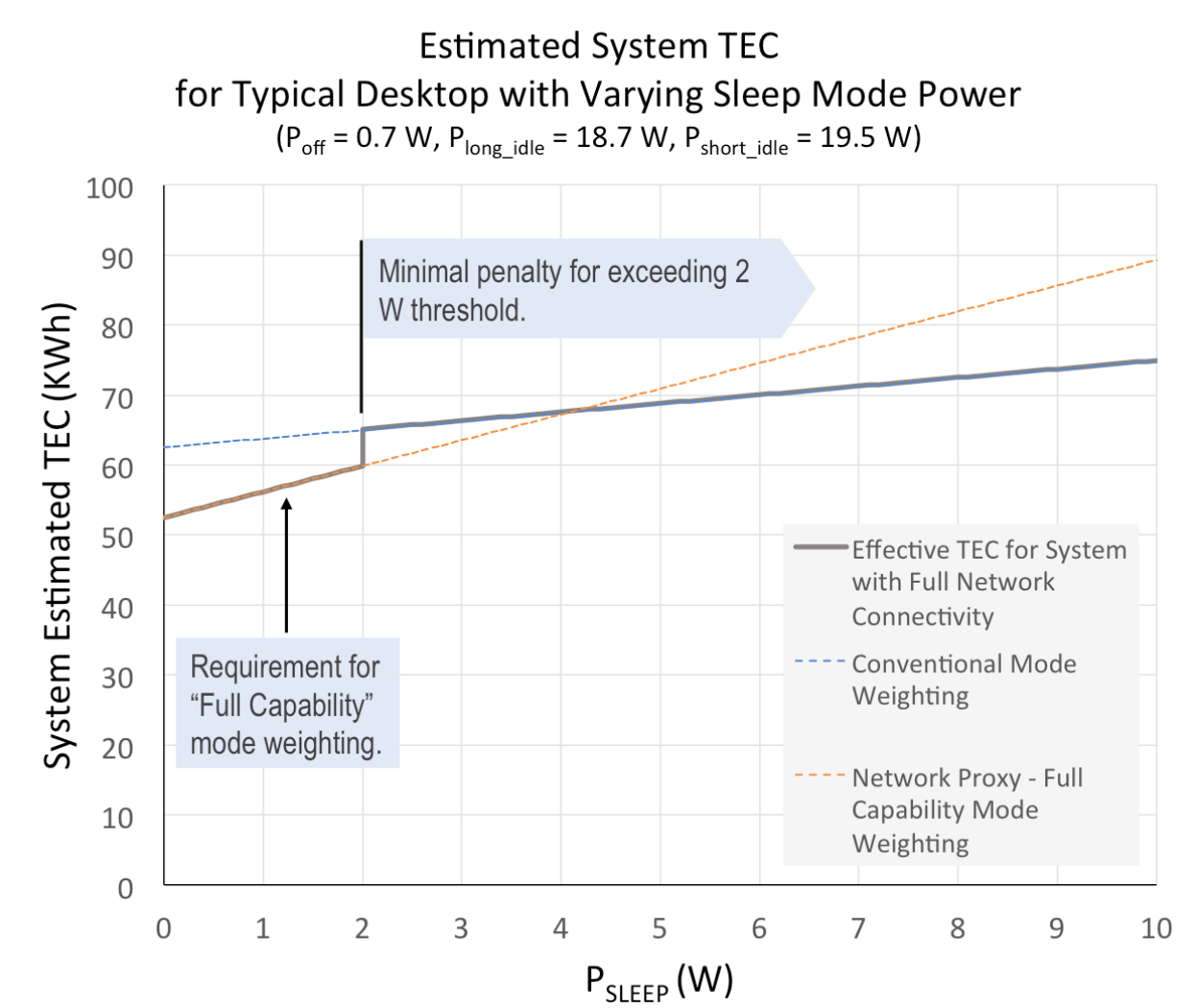

Figure 3: Relationship between estimated TEC and sleep power for a typical desktop with different allowed duty cycles

Our understanding is that the alternative low power mode approach was originally intended to accommodate computers systems that do not utilize a traditional sleep mode, such as ACPI S3. This might include Chrome OS products that use long idle mode as their sleep mode, for example. The alternative low power mode approach is not appropriate for new network-connected sleep states like Modern Standby and Power Nap. It will also not help EPA achieve its stated goal of "a constant network connection at power levels below 2 watts" as it does not provide manufacturers with a clear and unequivocal compliance path for systems implementing these new modes.

We recommend that EPA limit the applicability of the alternative low power mode approach in its Draft 2 language, prohibiting products with Modern Standby and Power Nap from utilizing this provision and clarifying that those products must certify using the Full Network Connectivity provisions described in sections 1(E)(3) and 3.5.1(iii).

3) We recommend that EPA tighten language for the Energy Efficient Ethernet (EEE) incentive by requiring that EEE technology is not only supported, but enabled as shipped.

The current draft continues to provide an incentive in the form of a 0.7 kWh/yr allowance for computer models that incorporate an "IEEE 802.3az-compliant (Energy Efficient Ethernet) Gigabit Ethernet port." The CA IOUs continue to support inclusion of this incentive as a means to foster adoption of highly efficient network protocols and technologies. However, we recommend that language be tightened to ensure that the Ethernet hardware is not only *compliant* with EEE, but that EEE features are *enabled by default* in the network adapter's driver settings. As the screenshot below indicates, some drivers for Ethernet adapters can contain toggles for EEE functionality (Figure 4), and anecdotal experience has shown that certain models may ship with the feature disabled.

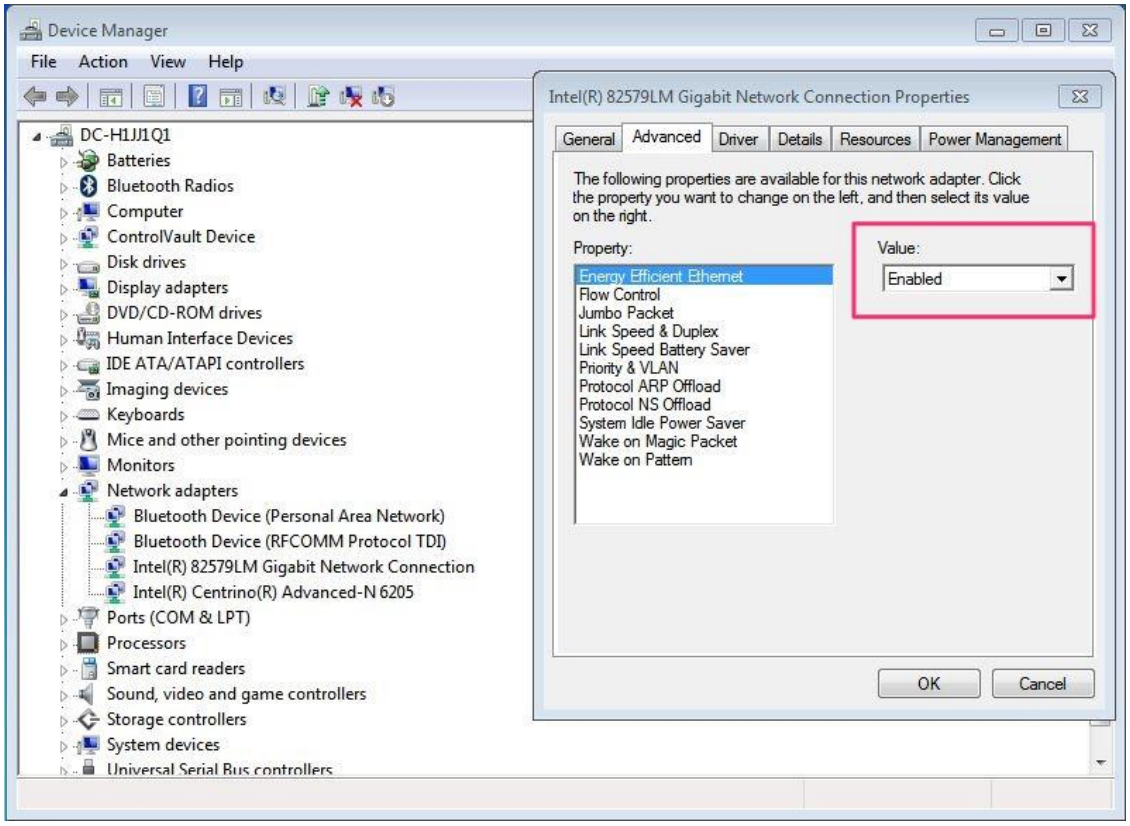

Figure 4: Screen shot from a manufacturer support article instructing users on toggling of EEE functionality[3]

Version 8 Comments

4) 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

[3] http://www.dell.com/support/article/us/en/19/sln79684/resolving-issues-with-energy-efficient-ethernet-(eee)-or-green-ethernet?lang=en

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.

5) 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 EPRI's 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% condition to be "low load"),[4] but ENERGY STAR's current PSU requirements only cover as low as the 20% load point, which equates to more than 40 W of 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 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.

6) 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.[5] More recent research supported by the UK 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.[6] 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.

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[4] http://docketpublic.energy.ca.gov/PublicDocuments/14-AAER-02/TN210102_20160130T110353_Douglas_McIlvoy_Comments_Results_from_laboratory_testing_for_th.pdf

[5] http://docketpublic.energy.ca.gov/PublicDocuments/14-AAER-02/TN211731_20160606T163325_California_Investor_Owned_Utilities_Comments_California_Investo.pdf

[6] http://www.superefficient.org/~/media/Files/Computer%20efficiency%20report/SEAD%20Report%20-%20Task%202%20-%20Final.ashx

Sincerely,

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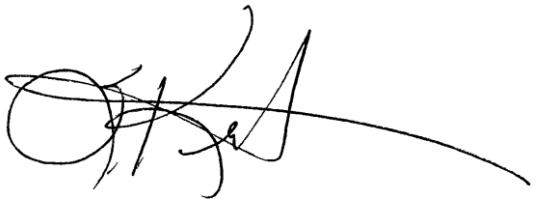

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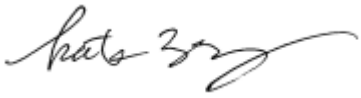

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