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Comment Received From: Donna Sadowy

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14-AAER -2 Appliance Efficiency Rulemaking, AMD

Additional submitted attachment is included below.



May 18, 2016

Commissioner Andrew McAllister
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Re: Docket No. 14-AAER-2: Final Draft Staff Report for Computers, Computer Monitors, and Signage Displays

Dear Commissioner McAllister:

Founded 47 years ago in Sunnyvale, California, AMD designs and produces microprocessors for computing and display needs. AMD's components bring visually compelling graphics and computing to research, entertainment, finance, healthcare, retail, education and more across the State of California.

As a company with deep California roots, we applaud the Commission's efforts to promote an environmentally sustainable future. In support of these efforts, since 2012 AMD has provided information and answered questions from Commission staff in this regulatory proceeding.

As the regulatory process concludes, its outcomes can – and should -- **advance the State's climate goals** while also **ensure Californians' access to promising future technologies, choice in technology purchases, and cost-savings through vendor competition.**

Toward that end, AMD provides the following comments:

AMD's Commitment to Energy Efficient Technology

AMD has a steady history of increasing the energy efficiency of our products. For example, we are ahead of our projected trend line to achieve our ambitious "[25x20 goal](#)"ⁱ to increase the energy efficiency of our accelerated processing units (APUs) 25 times by the year 2020 from a 2014 baseline.ⁱⁱ

AMD also recently previewed our revolutionary 14nm FinFET [Polaris GPU Architecture](#)ⁱⁱⁱ, highlighting significant architectural improvements including High Dynamic Range (HDR) monitor support and a promised 2x performance-per-watt improvement over the prior generation. The graphics processing units (GPUs) deliver a remarkable generational jump in power efficiency, and are designed for fluid frame rates in graphics, gaming, virtual reality, and multimedia applications on small form-factor thin and light computer designs.

Innovative Future Technologies

Technologies like the Polaris architecture enable new computing and display capabilities, such as enhanced security features, virtual/augmented reality, intelligent computing, immersive simulations, and high dynamic range displays for enhanced colors and contrast.

California industry and higher education institutions are presently exploring the societal benefit of these evolving compute technologies. For instance, The Medical Virtual Reality (MedVR) group at University of Southern California Institute for Creative Technologies is studying uses for virtual reality (VR) in simulation technology for [clinical purposes](#)^{iv}. Researchers at University of California, Davis have investigated use of VR for [earthquake modeling](#)^v. Stanford's Virtual Human Interaction Lab is investigating whether immersive VR can promote [sustainable behaviors for environmental conservation](#).^{vi} The Urban Simulation Team at University of California, Los Angeles is building a real-time [virtual reality model of the entire Los Angeles basin](#)^{vii} for use by urban planners, emergency response teams, architects and government entities.

Developing compute and display technologies such as VR will require significantly enhanced performance compared to today's products. Future VR technologies likely will be enabled by screen pixel densities 16x greater than what is available today, utilizing a display rate of six billion pixels per second.^{viii} In simplistic terms, these future technologies require power.

We urge the Commission to **avoid unintended regulatory constraints on future, promising computer technologies**. Driven by market needs and the desire for differentiation from competitors, history shows the industry will continue to innovate with energy efficiency as a key enabler of these future technologies.

Consumer Choice of Computer Device

Notebook (laptop) PCs and desktop PCs have distinct benefits and interests for consumers. Desktop PCs are generally more configurable, expandable and up-gradable than notebook PCs. Desktop PCs have been and will continue to be the point of innovation for many new usage scenarios that demand performance, such as machine learning and virtual/augmented reality simulations and gaming.

We urge the Commission to **ensure that any regulation accounts for the multiple and developing use cases that drive Californians' purchasing decisions of either a notebook or desktop PC**.

Benefits of Competition to Consumer Choice and Cost

Imposing unreasonable barriers for qualification of desktop platforms may uniquely harm consumer cost and the benefits of competition in the marketplace.

Within the x86 architecture market for compute processor units (CPUs) and system on chips processor units (that AMD calls APUs for Notebook and Desktop PCs), there are only two primary vendors supplying California consumers: AMD and Intel. Likewise, within the market for discrete graphics processing units (GPUs), there are only two primary vendors supplying California consumers: AMD and NVIDIA. We urge the Commission to **ensure vendor competition to spur innovation and the State's technology-driven economy**.

Of equal importance, competition promotes favorable pricing to consumers. The price of the processor in a personal computer is a major aspect of the overall cost. Lack of robust competition for this component part may reduce the cost effectiveness of future platforms entering the California market.

Thank you and the Commission's staff for your consideration of AMD's comments today and in the past. We remain available to provide additional information.

Sincerely,



Susan Moore
Corporate Vice President, Public Affairs

ⁱ <http://www.amd.com/en-us/innovations/software-technologies/25x20>

ⁱⁱ Taking the ratio of compute capability as measured by common performance measures such as SpecIntRate and PCMark, divided by typical energy use as defined by ETEC (Typical Energy Consumption for notebook computers) as specified in Energy Star Program Requirements Rev 6.0 10/2013.

ⁱⁱⁱ <http://www.amd.com/en-us/press-releases/Pages/amd-demonstrates-2016jan04.aspx>

^{iv} <http://medvr.ict.usc.edu/>

^v <http://www.davisenterprise.com/local-news/using-virtual-reality-to-study-earthquakes/>

^{vi} <https://vhil.stanford.edu/projects/>

^{vii} <http://www.ust.ucla.edu/ustweb/projects.html>

^{viii} <http://venturebeat.com/2016/01/15/amds-graphics-guru-describes-the-march-to-full-graphics-immersion-with-16k-screens/>