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May 9, 2013

California Energy Commission
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Re: Invitation to Participate: Set-top Boxes and Network Equipment (12-AAER-2A)

I. INTRODUCTION

The Telecommunications Industry Association (TIA) appreciates the opportunity to provide comments in response to the Commission's Invitation to Participate in the development of appliance energy efficiency measures regarding Set-top Boxes and Network Equipment. TIA represents hundreds of information and communications technology (ICT) manufacturer, vendor, and supplier companies in standards, government affairs and market intelligence. TIA's member companies' products and services empower communications in every industry and market, including healthcare, education, security, public safety, transportation, energy, government, the military, and entertainment. TIA's members produce the equipment and solutions that make up our Nation's rapidly evolving communications networks and would be directly impacted by mandated efficiency standards imposed on set-top boxes and network equipment.

A major function of TIA is the writing and maintenance of voluntary industry standards and specifications, as well as the formulation of technical positions for presentation on behalf of

the United States in certain international standards fora. TIA is accredited by the American National Standards Institute (ANSI) to develop voluntary industry standards for a wide variety of telecommunications products and sponsors more than 70 standards formulating committees. These committees are made up of over 1,000 volunteer participants, including representatives from manufacturers of telecommunications equipment, service providers and end-users, including the government. The member companies and other stakeholders participating in the efforts of these committees and sub-groups have produced more than 3,000 standards and technical papers that are used by companies and governments to produce interoperable products around the world. From this experience, TIA continues to witness firsthand the technological innovation in the ICT sector enabled by the use of voluntary industry standards. The flexibility provided by voluntary standards is of particular importance in the ICT sector as technologies in the sector continue to rapidly evolve and transfer and consolidate functionalities in different parts of the network.

TIA has serious and significant concerns with a rulemaking by the Commission that would mandate efficiency standards for set-top boxes and network equipment. Set-top boxes and network equipment are fundamentally different from other stand-alone, single function appliances typically covered by energy conservation standards. Energy conservation programs at the federal and state level have been successful in achieving energy efficiency gains in a variety of product categories where the future of the technology and competing technologies are well understood, the pathway to efficiency gains is clear, and the functionality of the product is not in a state of flux. Refrigerator-freezers, air conditioners, water heaters, furnaces, washers and dryers, ovens, pool heaters, showerheads, faucets, urinals, etc. are examples of single function,

mature products covered by mandatory energy conservation standards where the product technology was in a phase where regulatory bodies could set standards that are technically feasible.

TIA has serious concerns with applying this regulatory model to cover set-top boxes and network equipment given both the immature nature and rapid evolution of these technologies. Additionally, set-top boxes and network equipment function as part of a complex system and network where functionalities rapidly converge adding levels of complexity that a mandated regulatory process will be unable to address. Energy efficiency mandates have never been applied to nascent technologies like set-top boxes and other network equipment where the future functionalities of the technology are clearly in flux. Giving set-top boxes and network equipment the same regulatory treatment used to mandate the efficiency of toilets and other single function products will unavoidably result in unintended negative consequences for the innovation of set-top boxes and network equipment in the future, regardless of how carefully test procedures are crafted.

Set-top boxes and network equipment remain immature in terms of both technology and architecture. Mandating conservation standards at a main communications gateway to the home, where significant changes in functionality are most efficient and likely to occur will negatively impact innovation and competition in the marketplace and could result in higher energy consumption overall and higher costs to consumers. Voluntary standards are better suited to achieve the Commission's goals of improved energy efficiency for set-top boxes and network

equipment without hampering the innovation of a rapidly evolving set of technologies. TIA respectfully requests the Commission take into consideration the following recommendations.

II. DISCUSSION

1. "NETWORK EQUIPMENT" SHOULD BE EXCLUDED FROM THE SCOPE OF PRODUCTS UNDER CONSIDERATION BY THE COMMISSION IN THIS RULEMAKING

TIA recommends that "network equipment" should be excluded from the scope of this rulemaking. If the Commission determines to move forward with this rulemaking, the scope should be narrowed to focus exclusively on set-top boxes. The Commission has added "network equipment" late in the process and has provided little direction on what products the Commission is interested in examining in this category. In terms of process, the term "network equipment" does not appear as a subject of the rulemaking until the Commission webcast on April 4, 2013.[1] Network equipment was not included in the August 31, 2011 Scoping Workshop Notice or Agenda.[2] Network equipment is also not mentioned in the Invitation to Participate regarding this rulemaking dated March 25, 2013.[3] But for participation in the April 4th webcast, stakeholders would be completely unaware of the Commission's interest in network equipment. The lack of discussion or notice of intent from the Commission on the inclusion of network equipment has not provided stakeholders adequate direction or notice on what types of network equipment the Commission has under consideration.

[1] *See* California Energy Commission, Invitation to Participate Presentation (April 4, 2013) available at: www.energy.ca.gov/appliances/2013rulemaking/documents/2013-04_webex_meetings/presentations/Set-top_Boxes_326.pdf.
[2] *See* California Energy Commission, Efficiency Committee Workshop Notice (August 31, 2011) available at: www.energy.ca.gov/appliances/2012rulemaking/notices/2011-08-31_Workshop_Notice.pdf
[3] *See* California Energy Commission, Invitation to Participate (March 25, 2013) available at www.energy.ca.gov/appliances/2013rulemaking/documents/2013-03-25_invitation_to_participate.pdf.

Without additional guidance from the Commission, the term "network equipment" as discussed in the webcast presentation is impossibly vague. Network equipment could be interpreted to mean the entire network equipment domain including all communications infrastructure including consumer, enterprise, and carrier grade equipment, which cannot be the intent of the Commission. If interpreted more narrowly to focus on consumer premises equipment, there remain significant obstacles in including consumer network equipment and set-top boxes in the same rulemaking. Consumer premises network equipment such as routers and switches differ significantly in functionality and use from set-top boxes, and it would not be feasible to develop a test procedure applicable to both categories within the same rulemaking. Additionally, infrastructure devices, such as LNBs, ONTs, and ODUs present too much complexity to be included in the same rulemaking as set-top boxes and lack consensus test procedures.

2. THE COMMISSION SHOULD MAKE CLEAR THAT COMMERCIAL NETWORK INFRASTRUCTURE EQUIPMENT IS EXCLUDED FROM THE SCOPE OF THE RULEMAKING

As explained above, the term "network equipment" reads so broadly that it could include all consumer, enterprise and carrier grade equipment. TIA recommends that network equipment be excluded from this rulemaking and also recommends that the Commission make explicit that enterprise and carrier grade equipment is excluded from the scope of consideration for the rulemaking process. Commercial network equipment for enterprise and carrier customers differs dramatically from consumer network equipment and would be impossible to cover under this rulemaking.

The energy use of commercial network infrastructure equipment varies considerably based on the configuration and use by the end user, which is often customized for performance for enterprise and other users based on specific criteria. In addition to being used in the enterprise space, some commercial network equipment is also utilized outside of the enterprise in other large scale network environments, such as in datacenter and carrier networks. The complex, highly configured and customized nature of large network equipment creates significant challenges in identification of criteria and specifications that can be used to establish a suitable energy conservation standard.

Additionally, an energy conservation standard for large network equipment would face difficulties keeping pace with the rapid technology development taking place with network equipment as the ICT industry innovates to keep pace with accelerated demands on the network. Some categories of network equipment are integrating increased functionality, consolidating security, network management and other features into the product further complicating the development of a suitable standard or test procedure. In short, the unique challenges with commercial network infrastructure equipment would make the development of an energy conservation standard daunting if not impossible. Whatever action the Commission takes, TIA strongly recommends that commercial network equipment for enterprise and carrier customers should be excluded from consideration for coverage and requests that the Commission make this exclusion clear.

3. MANDATED ENERGY CONSERVATION STANDARDS FOR SET-TOP BOXES AND NETWORK EQUIPMENT WILL NOT RESULT IN GREATER ENERGY EFFICIENCY AND IS NOT NECESSARY OR APPROPRIATE TO CARRY OUT THE PURPOSES OF THE WARREN-ALQUIST ACT

Energy conservation is the primary purpose of the Warren-Alquist Act relevant to appliance energy conservation standards. Limiting the functionality of a set-top box or other network equipment by imposing an efficiency standard could result in the unintended consequences of increasing energy consumption by requiring consumers to buy separate future functionalities in separate devices where much of the functionality could be consolidated into individual devices. Examples of functionalities that could be consolidated rather than offered through multiple devices include home energy management and smart grid devices, home security systems, health monitoring systems and VoIP. Setting an energy efficiency standard for set-top boxes or other home network equipment such as routers might increase the efficiency of the individual devices, but such standards would lead to a proliferation of separate devices to cover each functionality a consumer desired in the future. Mandating efficiency standards are most effective for mature, single-function devices. Set-top boxes and network equipment have the potential to change functionality significantly over the next several years. The network termination point for the home is not at a stage of development where it can receive the same regulatory treatment as a water heater or faucet. Mandating efficiency standards at this stage will create a disincentive for the development of multi-function devices, particularly for devices with gateway functionality.

Set-top boxes and network equipment have seen significant advances in improving energy efficiency in the absence of mandated standards. Specifically, the platform architecture for set-

top boxes has evolved the current architecture where a host set-top box with higher energy consumption is networked to multiple client set-top boxes in the home with significantly reduced energy consumption. This architecture would not have developed if a mandated standard existed that limited the technology community from increasing the functionality of the host set-top box. TIA anticipates additional changes in functionality for set-top boxes in the future as they have the potential to develop into a main communications gateway for the home. Mandated efficiency standards are counterproductive for technologies that have significant changes in functionality. There is no clear technology path forward that industry is not already pursuing and integrating into their products in this market that mandated standards would accelerate or make more feasible. Deep sleep modes are often discussed as a means to achieve greater efficiency, but requiring deep sleep modes for host set-top boxes would result in eliminating set-top boxes as a competing technology as a main communications gateway to the home. Mandating energy efficiency standards could preclude the development of VoIP services for set-top boxes and other future functionalities that would be more efficient if consolidated into a multi-function device. In short, mandating conservation standards for set-top boxes and network equipment could result in higher energy consumption overall and higher costs to consumers while negatively impacting innovation and competition in the marketplace.

4. A COMMISSION RULEMAKING ON SET-TOP BOXES IS AT RISK OF FEDERAL PREEMPTION

Federal law expressly preempts the Commission from adopting energy conservation standards for cable set-top boxes. Imminent action by the DOE in regulating all set-top boxes places any Commission regulation with regard to any category of set-top box at immediate risk

of federal preemption. The Commission should exclude set-top boxes from its current rulemaking.

For cable set-top boxes, the Cable Act expressly restricts state or local regulation that would "prohibit, condition or restrict a cable system's use of any type of subscriber equipment or any transmission technology."[4] The Cable Act provided federal preemption of state and local standards for cable systems to avoid the very problems that a CEC energy conservation standard would create: a patchwork of nonuniform, mandatory technical requirements that would impair the development of cable systems and the ability of industry to quickly adapt to technological advances. Because the Cable Act prohibits state or local adoption of technical standards for cable systems, a mandatory energy conservation standard created through this rulemaking process would improperly restrict cable systems.

The DOE has resumed its proposed rulemaking process to develop a federal energy conservation standard for all categories of set-top boxes, which was started in December of 2011.[5] Most recently, the DOE published an initial analysis estimating the potential impacts of an energy conservation standard for set-top boxes and published a notice of proposed rulemaking for a test procedure for set-top boxes signaling the DOE's intent to continue to move forward with a rulemaking to adopt a mandatory energy conservation standard for set-top boxes. Engagement by the Commission on set-top boxes will be duplicative of regulatory activities currently under way at the DOE placing the Commission's rulemaking activities under immediate risk of federal preemption. TIA recommends that the Commission avoid expending

[4] *See* 47 U.S.C. § 544(e).
[5] *See* US Department of Energy Rulemaking for Set-top Boxes Energy Conservation Standards and Test Procedure available at: www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx/ruleid/33.

both government and industry resources to engage in another level of standards development process that will likely be preempted by the federal standard.

5. MANDATED ENERGY CONSERVATION STANDARDS FOR SET-TOP BOXES AND NETWORK EQUIPMENT WILL BE UNABLE TO ANTICIPATE TECHNOLOGY CHANGES AND WOULD SIGNIFICANTLY IMPAIR INNOVATION OF SET-TOP BOX AND NETWORK EQUIPMENT TECHNOLOGY

Given the rapid evolution of set-top box and network equipment technologies, anticipating technology changes is critical to the development of a suitable standard and test procedure to avoid the unintended consequence of a set-top box rulemaking stifling future technology development with set-top boxes. The problem with anticipating technology changes for set-top boxes and most ICT equipment in general, is that it is impossible to do.

A good analogy for potential future innovation with set-top boxes and network equipment is the mobile phone. Set-top boxes and other network equipment are similar to mobile phones in that they are ICT devices utilized daily by most consumers and function as a primary communications gateway, making them a natural convergence point for multiple functionalities and innovation of future consumer services. Over the last two decades, we have watched mobile phones rapidly develop from devices providing basic voice and simple text messages to the current smart phone that continually integrates more functionality in unanticipated ways. Two decades ago, no one would have anticipated that mobile phones would be able to conduct medical grade electrocardiograms or blood tests. As a single device, the smart phone supplants a long list of consumer devices including: alarm clocks, GPS devices, pocket digital cameras, mp3 players, radios, personal digital assistants, voice recorders, game consoles, and a host of other

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devices now replaced by applications. The ability to consolidate functionality in a single device results in significant benefits to consumers and, most relevant to this proceeding, reduced energy consumption. Most, if not all, of this innovation may never have occurred if mandated efficiency standards currently being proposed for set-top boxes had been applied to first or second generation mobile phones, as mobile phone functionality would have been frozen in time to provide basic voice and simple text messaging.

Two decades ago, when mobile phones were less complex, some environmental advocates explored and put forward ideas to limit the energy consumption of mobile phones, including energy consumed through higher cell phone functions on the other side of the battery and battery charger system. Two decades ago it would have been possible for the Commission, environmental advocates and the mobile phone industry to come together to develop a test procedure, measure the efficiency of an entire mobile phone in operation and develop energy conservation standards for mobile phones. In hindsight, this would have had catastrophic impacts on the innovation and convergence of technologies in smart phones as well as the efficiency that follows combining functionalities in a single device.

This rulemaking would take the regulatory burden that was not imposed on mobile phones and would impose it on set-top boxes and network equipment. In terms of technology development, set-top boxes and other consumer network equipment are at the same stage as first and second generation mobile phones two decades ago. While set-top boxes currently have a primary function of delivering video services, the potential for convergence of other unanticipated functionalities into set-top boxes is extremely high. It is critical for the

Commission to recognize the role that software upgrades will play in changing the energy use profile of set-top boxes. In addition to software upgrades by service providers, software could provide a much larger role in set-top boxes moving forward. Similar to mobile phones, it is not far-fetched to imagine the development of an app store for set-top boxes where consumers select from a wide range of software applications, each with their own distinct energy use requirements. VoIP, home security systems, home health monitoring and home energy management are a few examples of future functionalities that could be controlled through set-top boxes, and there are doubtless many other applications and functionalities that could converge in set-top boxes that we are not anticipating. An energy efficiency mandate from the Commission would not provide the flexibility needed for vendors and service providers to develop such applications and consolidate additional functionalities into set-top boxes.

Limiting the functionality of set-top boxes and other network equipment will also limit innovation and competition in devices at the gateway to the home by picking technology winners based solely on the energy efficiency of the technology. The video delivery market has been in a constant state of flux over the last decade and will continue to see rapid changes in the near term. Consumers access video via traditional cable providers, satellite TV, over-the-top (OTT) streaming, IP based services and mobility solutions. Consumers now have the option to consume video in unprecedented ways with unprecedented means, and the evolution of technologies in this space will continue to accelerate. Imposing efficiency standards on this highly competitive market would likely result in any developed standard being outdated by the time it was completed. For example, had the Commission started developing an energy efficiency standard in this field five years ago, solutions such as Apple TV, Hulu, Netflix streaming, among others,

would not have even existed. Imposing an energy efficiency standard on video delivery devices would have a chilling effect on technological innovation in this market, which could also hamper conservation efforts in the long term by steering technology research and development efforts away from technology innovation that could eliminate the need for set-top boxes entirely. Given the rapid evolution of the market, a voluntary model such as ENERGY STAR is preferred to achieve energy efficiency gains while preserving competition and innovation in the market.

6. VOLUNTARY STANDARDS, SUCH AS THE ENERGY STAR PROGRAM ARE THE BEST VEHICLE FOR IMPROVING THE ENERGY EFFICIENCY OF SET-TOP BOXES AND NETWORK EQUIPMENT MOVING FORWARD

Mandating efficiency standards for set-top boxes and network equipment by the Commission would be duplicative and would not be complementary to efforts that the ENERGY STAR program has undertaken specific to set-top boxes and small and large network equipment. As a voluntary program, the ENERGY STAR program provides the flexibility and ongoing dialogue necessary to address changes in functionality and energy consumption of set-top boxes and network equipment as they occur in ways that would not be possible under a mandatory regime. In Europe, for example, the EU recognized the importance of voluntary action with these technologies, and accepted a voluntary industry agreement modeled after the ENERGY STAR program specification as the implementing measure under the European Commission's directive on energy efficiency. TIA and our members are actively engaged with the ENERGY STAR Program in developing leading energy efficiency standards for set-top boxes and small and large network equipment, pushing for substantial reductions in qualifying energy allowances. Industry in the U.S. has signed a voluntary agreement that makes dramatic improvements in energy

efficiency of set-top boxes without sacrificing future innovation of set-top box technologies. A mandated approach, focused on minimum standards and without the flexibility provided by the ENERGY STAR Program, would not be able to achieve efficiency gains achievable through industry working with ENERGY STAR.

TIA and our members have long been supporters of the ENERGY STAR program in a variety of product categories and commend the program as a successful partnership between the EPA, DOE and industry to recognize and reward innovation in energy efficiency. TIA's members greatly value the ENERGY STAR certification, and rely on this certification to market their products to retailers and consumers. ENERGY STAR has played a critical role in providing incentives and to reward the production of energy efficient technologies. TIA and our members are actively engaged with the ENERGY STAR program in advancing specifications for small network equipment, large network equipment and set-top boxes.

III. CONCLUSION

TIA appreciates the opportunity to provide input to the Commission in response to the Invitation to Participate and looks forward to continuing to work with the Commission and other stakeholders moving forward.

Respectfully signed and submitted on May 9th, 2013.

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/s/ DANIELLE COFFEY

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