CCTA

California Cable & Telecommunications Association

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California Energy Commission
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May 15, 2014

VIA EMAIL

California Energy Commission – Docket Unit
Attn: Docket No. 12-AAER-2
Appliance Energy Efficiency Standards Rulemaking
Re: Network Equipment Docket No. 12-AAER-2A
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

Re: Comments of the California Cable & Telecommunications Association and the National Cable & Telecommunications Association on CEC Request for Revised Proposals and Information

Dear Commissioners:

The California Cable & Telecommunications Association ("CCTA") and the National Cable & Telecommunications Association ("NCTA") respectfully submit their joint comments in response to the Request for Revised Proposals and Information in the Development of Appliance Energy Efficiency Standards released by the California Energy Commission (the "Commission" or CEC) with respect to network equipment.[1] CCTA and NCTA are the principal trade associations for the California and U.S. cable industries, respectively. Their members serve more than 90 percent of the nation's cable television households, including, in California, more than 5 million video subscribers, 6.4 million broadband subscribers, and 3.4 million competitive telephone service subscribers. The cable industry has invested more than $25 billion in California since 1996 to build interactive broadband networks that are available to 98 percent of all California households. The cable industry in California employs more than 65,000 people and contributes $800 million in taxes and fees in California alone.

The cable industry's commitment to energy efficiency should be quite evident. The industry created CableLabs - Energy Lab, bringing together operators, suppliers and developers to develop energy efficient solutions. It led the way to establish the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes ("Voluntary Agreement" or "VA"), which has already secured substantial energy conservation. Cable operators are using creative and energy-efficient methods for meeting the skyrocketing consumer demand to enjoy cable services anytime, anywhere, on any screen. And CableLabs has baked energy efficiency into the specifications for next generation broadband and IP services.

[1] California Energy Commission, Request for Revised Proposals and Information in the Development of Appliance Energy Efficiency Standards, Docket 12-AAER-2A (Jan. 15, 2014).

As discussed below, the proposals before the CEC to impose regulations governing the energy efficiency for small network equipment (SNE) like cable modems, routers and other networking equipment fail to meet the requisites of the Warren-Alquist Act. The CEC cannot show that the regulatory proposals before it would not result in added costs for consumers or to the broadband industry. Rather than assuring no added total costs to consumers over the life of the product, the proposals wishfully suppose "zero" costs and ignore the serious costs in innovation and to the broadband economy. No technologically feasible efficiency levels have been proposed. Rather than assuring product efficacy, the proposals would undermine the current and new features required for the devices today and for the future of broadband. Experts have specifically warned that, when it comes to broadband, if Internet growth lags by just two percent, it would reduce economic growth by $100 billion. The proposed regulatory approach to SNE is based on legacy technology that does not accommodate competition in broadband services or the current and future functionalities of broadband equipment. There is no compelling case, indeed, no case at all, to assert that the benefits of regulation outweigh the potential harms that could arise from state regulation. Because the regulatory approach to SNE before the CEC does not, and cannot, meet the requisites of the Warren-Alquist Act, it must be rejected.

Nonetheless, the cable industry in California and nationally is committed to energy efficiency. The Voluntary Agreement, signed by a diverse group of energy efficiency advocates, providers and the equipment industry, provides for new energy standards that will improve set-top box efficiency and that are already achieving significant energy savings, with an effective but flexible approach that does not undermine innovation. The VA includes specific provisions committing the parties to joint efforts to develop energy efficiency measures for application to SNE. Rather than pursue a regulatory approach that would pose great peril to the industry, to consumers and to the economy – and which would not meet even the primary requisites of the Warren-Alquist Act – the CEC should encourage the parties to the VA to achieve the energy efficiency goals sought for California.

A. The Investor-owned Utilities' Proposals for SNE Do Not Meet the Requirements of the Warren-Alquist Act Because There Is No Basis for Claiming Zero Incremental Costs to Consumers.

The investor-owned utilities (the "IOUs")[2] recommend that the CEC adopt a mandatory energy efficiency standard for residentially-focused SNE product classes and a test and list requirement for small enterprise and fixed wireless broadband access devices. The proposal includes a maximum power allowance for base and adder functionality for each product class, and it estimates that only 17 percent of products in today's market can meet the standard.[3]

[2] The Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), San Diego Gas & Electric (SDG&E).

[3] California IOUs Response to Invitation for Standards Proposal for Small Network Equipment, Codes and Standards Enhancement (CASE) Initiative (July 29, 2013) ("IOU Proposal") at 45.

Under the Warren-Alquist Act, a CEC energy efficiency standard must add no total costs to consumers over the life of the product.[4] The IOU proposal seeks to meet this requirement by claiming "zero" incremental cost to implement their proposed standards.[5] But the IOUs have no basis for asserting "zero" incremental cost. They admit that they did not receive or collect any cost information. All they did was compare the retail list price of 45 products studied by NRDC.[6]

This approach to estimating "zero" incremental cost is factually unsupportable. Prices for retail electronics are set competitively by feature, power of the brand, share of market, momentary goals of the vendor, and whether margins can be made through bundled charges. The bill of materials can vary widely, and the price point can temporarily be the same, as vendors seek to introduce new products into the market. To illustrate, Microsoft introduced the Surface with initial promotional discounts but rose quickly to a price point equivalent to the iPad.[7] Amazon sold the Kindle at a loss to gain market share and gain back its margin through eBooks and ecommerce.[8] Samsung rapidly gained market share with expensive marketing and shrinking margins until its profits collapsed this year.[9] As Apple's market share began to erode, it wrapped an iPhone 5c in plastic and cut its high retail price.

The price of equipment at a moment in time tells nothing about its cost or where the necessary margin is gained when bundled with other services. The IOUs performed no analysis of costs, and in fact ignore all components, features and costs in between device inputs and outputs. A momentary equivalence of retail price between devices tells nothing about component cost, costs reflected in wholesale charges to service providers, costs reflected in bundled charges to consumers, or that there is a cost of zero to turn one processor, memory, DOCSIS modem or gateway device from one thing into another.

Estimating "zero" incremental cost also ignores all of the cost externalities of handicapping the very equipment that brings us the social, networking, shopping,

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[4] Cal. Pub. Res. Code § 2540(c)(1).

[5] IOU Proposal at 1, 37.

[6] IOU Proposal at 37.

[7] Andrew Rassweiler, Microsoft Surface RT More Profitable than iPad, Teardown Analysis Reveals, IHS (Nov. 5, 2012), https://technology.ihs.com/414155/microsoft-surface-rt-more-profitable-than-ipad-teardown-analysis-reveals.

[8] Peter Svensson, Kindle Fire Price: IHS Report Finds Amazon Selling Tablets At A Loss, Huffington Post (Nov. 11, 2011) http://www.huffingtonpost.com/2011/11/18/kindle-fire-price_n_1101847.html (Kindle Fire cost of components and assembly are more than Amazon charges for it, without even accounting for costs of development, marketing or packaging).

[9] Jungah Lee, Samsung Profit Drops as New IPhones Win Sales, Won Gains, Bloomberg News (Jan. 24, 2014), http://www.bloomberg.com/news/2014-01-23/samsung-profit-misses-estimates-as-new-iphones-win-share.html

telecommuting, video streaming, job-seeking, job-creating, and start-up opportunities of the Internet and the costs to the broadband economy that drives investment, growth and jobs, as we describe in Part E.

The IOUs have failed to meet their burden to establish that there are no incremental costs to the adoption of their proposal, and they cannot do so because there is no basis for claiming "zero" incremental cost to implement their proposed standards.

B. The Risks of State Regulation are Outweighed by its Minimal Potential Benefits

The Warren-Alquist Act requires the CEC to undertake a cost-benefit analysis prior to adoption of any energy standard.[10] Under this balancing approach, there is no compelling case to risk the potential harms that could arise from state regulation of broadband network equipment. Even with all of the foundational errors in approach and analysis, and a fictional projection of zero incremental cost, the very best savings that NRDC projects under the IOU proposal is $50 million[11] – which amounts to approximately 1 cent per household per day.[12] Of course, once real functionalities and costs are accounted for, there is no indication of any significant statewide savings. But even taking the $50 million estimate, most consumers would consider 1 cent per day for fast reliable Internet services well worth the savings in the social, networking, shopping, telecommuting, online, job-seeking, job-creating, start-up, and transformational benefits of the broadband economy.

In addition, the CEC proposal to impose such energy standards is at cross-purposes with federal efforts. Service providers are working with a Federal Communications Commission (FCC) Technical Advisory Committee on how to assure the resilience of communications equipment and networks during a natural disaster and power outage, and capping energy consumption as proposed by the IOUs provides insufficient room for battery backup, an item under consideration by the FCC. Regulation by CEC would also conflict with the decision by the Department of Energy, hailed by both sides of the aisle in Congress, to terminate proposed mandatory rules for both set-top boxes and network equipment in favor of the Voluntary Agreement.[13]

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[10] Cal. Pub. Res. Code § 25402(c)(1).

[11] Natural Resources Defense Council, NRDC Proposals on Small Network Equipment (July 29, 2013) ("NRDC Proposal") at 1.

[12] $50 million divided among the 13,101,887 residential electricity customers in California, as reported by the EIA.

[13] DOE, U.S. Energy Department, Pay-Television Industry and Energy Efficiency Groups Announce Set-Top Box Energy Conservation Agreement; Will Cut Energy Use For 90 Million U.S. Households; Save Consumers Billions (Dec. 23, 2013), http://energy.gov/articles/us-energy-department-pay-television-industry-and-energy-efficiency-groups-announce-set-top. This

C. Broadband Network Equipment is the Critical Backbone of the Broadband Economy, and an Essential Tool for Conserving Residential Energy

A Commission decision of whether to regulate broadband network equipment presents enormous higher stakes. Broadband modems, routers and other networking equipment have fueled the explosive growth of broadband Internet access in California and throughout the United States, massive economic development, and new ways to save energy. Both the federal government and the California Public Utilities Commission (CPUC) have sought to accelerate this revolution. As the FCC has noted, "[b]roadband is a transformative infrastructure, and Americans increasingly are using broadband at home and on their smartphones and tablet computers everywhere they go – at home, school, work, and travel." [14] The State of California has repeatedly recognized the vital importance of broadband and has established the California Advanced Services Fund to promote the ubiquitous availability of broadband services throughout the state for economic and social development. [15]

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discussion does not include all of CCTA's and NCTA's legal arguments, which they may submit if there are subsequent stages of this proceeding.

[14] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, Eighth Broadband Progress Report, 27 FCC Rcd. 10342 ¶ 6 (2012) ("*2012 Section 706 Report*"). *See also*, *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities,* Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd. 4798 ¶ 10 (2002) (explaining the functions and benefits of cable modem service); *see generally* FCC, *Connecting America: The National Broadband Plan* (2010), *available at* http://download.broadband.gov/plan/national-broadband-plan.pdf ("*National Broadband Plan*"). As the FCC later noted, "[t]he 2010 National Broadband Plan recommended that the Commission . . . set a goal of 100 million U.S. homes having affordable access to actual download speeds of at least 100 Mbps and actual upload speeds of at least 50 Mbps by 2020, to create the world's most attractive market for broadband applications, devices, and infrastructure." *2012 Section 706 Report* ¶ 6 (citing *National Broadband Plan* at 9).

[15] *See, e.g.*, Cal. Pub. Util. Code § 281 (instructing the CPUC to "develop, implement, and administer the California Advanced Services Fund program to encourage deployment of high-quality advanced communications services to all Californians that will promote economic growth, job creation, and the substantial social benefits of advanced information and communications technologies"); Press Release, CPUC, CPUC Approves Consortia Grants to Increase Broadband Adoption (Feb. 16, 2012), http://docs.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/159805.htm (quoting Commissioner Catherine J.K. Sandoval, who said, "High-speed Internet access is key to enabling the people of

Broadband drives investment, growth and jobs. According to Broadband for America, a 300+ member coalition focused on broadband access and adoption, from 1996 to 2011 Internet providers invested nearly $1.2 trillion in American Internet infrastructure. [16] Cable companies alone have invested $210 billion in infrastructure since 1996. [17] Six of the top 20 nonfinancial companies that invest in America are broadband providers.[18] Their investment goes well beyond infrastructure, as the broadband Internet industry and related information and communications technology (ICT) industries support 6.3 million jobs annually in the U.S.[19] The emergent apps economy now employs more than 750,000 Americans – up from zero in 2007.[20]

This investment has certainly paid dividends. Broadband speeds have increased 32 fold in the past seven years, improving productivity and the user experience for millions of home and

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California and our state to compete in the 21st century"); CPUC, *California Broadband Report: A Summary of Broadband Availability and Adoption in California as of June 30, 2011* (Sept. 2012) at 1, *available at* http://www.cpuc.ca.gov/NR/rdonlyres/7D2EFC43-A4E3-46CE-BE3B-18E765CF4D08/0/California_Broadband_Report__June_2011_CPUCmmCLEAN.pdf ("Widespread adoption and use of broadband Internet services is a primary goal of the State of California. State-financed or state-created programs exist to help close the 'Digital Divide' both by increasing geographic access to broadband, such as the California Advanced Services Fund (CASF), as well as by promoting adoption and use of broadband, such as the California Emerging Technology Fund (CETF)."). The California Emerging Technology Fund is counting on successful broadband deployment throughout the state for economic and social development. *See* NTIA, California Emerging Technology Fund, Access to Careers and Technology - ACT project description, http://www2.ntia.doc.gov/files/grantees/factsheetcacaliforniaemergingtechnologyfund.pdf (noting "the need for broadband tools to help people develop information technology (IT) skills, digital literacy, and improve job placement").

[16] *See* Broadband for America, *Broadband in America: Leading America into the Future*, BroadbandforAmerica.com (Mar. 20, 2014), *available at* http://www.broadbandforamerica.com/sites/default/files/BroadbandInAmericaBrochure.pdf ("*Broadband for America Infographic*"). *Broadband for America Infographic* (citing USTelecom, "Broadband Industry Stats," "Investment").

[17] NCTA, Industry Data, Tracking Cable's Investment in Infrastructure, NCTA.com, https://www.ncta.com/industry-data (charting aggregate capital infrastructure investment by year, through 2013).

[18] *Broadband for America Infographic* (citing Progressive Policy Institute, "U.S. Investment Heroes of 2013: The Companies Betting on America's Future" (Sept. 2013)).

[19] *Id.* (citing United States Telecommunications Ass'n, "Broadband Industry Stats," "Jobs," http://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment).

[20] *Id.* (citing Michael Mandel, *The Data Economy Is Much, Much Bigger Than You (and the Government) Think*, The Atlantic (July 25, 2013)).

business users.[21] VoIP services have already introduced robust competition into the voice market and attracted over 40 million customers.[22] Meanwhile, broadband is the platform supporting the $1.3 trillion manufacturing and services businesses of Cisco, Apple, Intel, Google, Facebook, eBay, and Yahoo, as well as countless other California companies.[23]

At the recent California Foundation on the Environment and the Economy (CFEE) Roundtable Conference on Information and Communications Technologies (ICT), University of Southern California (USC) Professor Jonathan Aronson reported that ICT revenues currently stand at $5 trillion per year and that 20 percent of all new jobs worldwide are linked to ICT.[24]

Broadband and networking also offer much more than economic benefits. These technologies have proven to facilitate significant energy savings. For instance, telecommuting enabled by broadband has resulted in enormous savings of gasoline and CO_2 emissions and has dramatically increased productivity.[25] One recent study concluded that "[e]ncouraging the

[21] *Id.* (citing difference in Comcast's fastest tier download speeds from 2007 to 2014). *See also* Comcast, *Speed Wins: XFINITY Delivers the Fastest Internet, Now with Download Speeds Up to 505 Mbps*, Comcast.com, http://www.comcast.com/505 (noting that, as of March 2014, Comcast's top broadband speed tier for residential service is 505 Mbps, which is 31.56 times faster than the company's top-tier speed in 2007 (16 Mbps)).

[22] Industry Analysis and Technology Division, FCC Wireline Competition Bureau *Local Telephone Competition: Status as of December 31, 2012,* Figure 5 *(*November 2013), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-324413A1.pdf.

[23] Total derived from the named companies' respective market caps, as reported via Yahoo! Finance on Mar. 27, 2014.

[24] Remarks of Professor Jonathan Aronson, California Foundation on the Environment and the Economy (CFEE) Roundtable Conference on Information and Communications Technologies (ICT), Feb. 27, 2014 ("Aronson CFEE Remarks").

[25] Estimates regarding the number of telecommuters vary by source, primarily due to how the term is defined and how many hours of telecommuting per week or month qualifies an individual as a "telecommuter." The U.S. Census Bureau estimates that, in 2010, 13.4 million people worked at least one day at home per week, and 5.8 million worked the majority of the week at home. Press Release, U.S. Census Bureau, *Census Bureau Report Shows Steady Increase in Home-Based Workers Since 1999* (Oct. 4, 2012), https://www.census.gov/newsroom/releases/archives/employment_occupations/cb12-188.html (announcing report based on findings from the Survey of Income and Program Participation and the American Community Survey). The FCC noted in the National Broadband Plan that "[e]very additional teleworker reduces annual CO_2 emissions by an estimated 2.6–3.6 metric tons per year." *National Broadband Plan* at 272 (citing Global e-Sustainability Initiative, SMART 2020, United States Report Addendum 49 (2008)). Based on a more conservative estimate of this emission reduction figure (2.0 metric tons/year) and a lower estimate of the number of telecommuters to account for discrepancies between different measurements of

development of technology such as broadband services, which will facilitate the use of more telecommuting, could become one of the most important economic public policy initiatives, because it helps the environment while augmenting economic growth."[26] Nationwide, the millions of U.S. telecommuters are saving hundreds of millions of gallons of gasoline and tens of millions of metric tons of greenhouse gases each year.[27] U.S. Census data show approximately five percent of workers in California metropolitan areas are telecommuters.[28] Even productivity

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total telecommuters (5.0 million telecommuters), these statistics suggest that U.S. telecommuters contribute to an annual CO_2 emission reduction of approximately 10 million metric tons.

[26] Joseph P. Fuhr & Stephen Pociask, *Broadband and Telecommuting: Helping the U.S. Environment and the Economy*, LOW CARBON ECONOMY, Vol. 2 No. 1, 2011, at 41-47 (Mar. 2011), *available at* http://www.scirp.org/journal/PaperDownload.aspx?paperID=4227 ("*Broadband and Telecommuting*").

[27] *See* Kate Lister & Tom Harnish, *The State of Telework in the U.S.*, Telework Research Network (June 2011), *available at* http://www.workshifting.com/downloads/downloads/Telework-Trends-US.pdf (summarizing key findings on telecommuting statistics and trends). Global Workplace Analytics estimates that, through 2012, there are 3.3 million teleworkers who telecommute at least half the time. In addition, there are 2.8 million self-employed workers who work primarily at home. The number of infrequent telecommuters who work at least one day a month from home is estimated to be approximately 25 million. *See* Global Workplace Analytics, Latest Telecommuting Statistics, http://www.globalworkplaceanalytics.com/telecommuting-statistics. Other studies have also found massive energy savings from telecommuting. In a 2007 study, TIAX LLC determined that 3.9 million telecommuters in the U.S. contributed to a total savings of 840 million gallons of gas and a CO_2 reduction of 10-14 million metric tons per year. *See* TIAX LLC, *The Energy and Greenhouse Gas Emissions Impact of Telecommuting and e-Commerce* (July 2007), *available at* http://internetinnovation.org/files/special-reports/CEA_Powerpoint.pdf (concluding that "ICT allows workers and consumers to participate in many daily activities, often with lower overall energy and fuel consumption and lower CO2 generation – on an annual basis, significant national energy savings accrue"). In their *Broadband and Telecommuting* paper, Fuhr and Pociask concluded that increased broadband and expanded telecommuting "can reduce greenhouse gas emissions over the next 10 years by approximately 588.2 tons of which 247.7 million tons is due to less driving, 28.1 million tons is due to reduced office construction, and 312.4 million tons because of less energy usage by businesses." *Broadband and Telecommuting* at 41.

[28] U.S. Census Bureau data from 2010 presents the number and percentage of workers in metropolitan statistical areas throughout the U.S. who telecommute, including the following California metro areas:

- Los Angeles-Long Beach-Santa Ana - 281,778 telecommuters, 5.0 percent of workers has been boosted by telecommuting, with multiple studies reporting 10-45 percent gains in productivity from telecommuting. [29]

Broadband equipment is also essential to the future of residential energy savings,[30] from remote control of thermostats,[31] to whole home energy management,[32] to smart appliances,[33] and

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- San Francisco-Oakland-Fremont - 126,057, 6.2 percent
- San Diego-Carlsbad-San Marcos - 70,097, 5.3 percent
- Riverside-San Bernardino-Ontario - 59,902, 3.8 percent
- Sacramento-Arden-Arcade-Roseville - 48,880, 5.5 percent
- San Jose-Sunnyvale-Santa Clara - 42,548, 5.1 percent

Extrapolating energy savings from just these 629,262 telecommuters from the six listed metro areas (multiplied by a conservative estimate of savings of 2.0 metric tons of CO_2 emissions per year, less than the FCC statistics cited *supra*), California has realized annual energy savings of at least 1.26 million metric tons of CO_2 emissions from telecommuting.

[29] *See, e.g.*, Global Workplace Analytics, *Costs and Benefits*, http://www.globalworkplaceanalytics.com/resources/costs-benefits (discussing productivity gains reported in various studies, based on Global Workplace Analytics' extensive review of the telecommuting literature of more than 500 studies). According to Global Workplace Analytics, "Best Buy, British Telecom, Dow Chemical and many others show that teleworkers are 35-40% more productive. . . . JD Edwards teleworkers are 20-25% more productive than their office counterpoints. . . . American Express workers produced 43% more than their office based counterpoints . . . [and] Compaq increased productivity 15% – 45%." *Id.*

[30] *See, e.g.*, *National Broadband Plan* at Section 12.2 (pp. 253-257) (discussing how broadband and better connectivity can increase energy and cost savings); Karen Ehrhardt-Martinez, Kat A. Donnelly & John A. "Skip" Laitner, *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities*, American Council for an Energy-Efficient Economy (ACEEE) (June 2010) at vii, *available at* http://www.aceee.org/research-report/e105 (stating that "[t]he future of home energy management is likely to involve a complex network of wireless, consumer-controlled, home automation systems," explaining that the "complete home energy management system includes a complete network of residential wireless and wired sensor networks, display and feedback devices, and automation that may or may not communicate with the utility," and concluding that, among other things, "[w]eb software, smart thermostats, in-home energy displays, and other home automation devices can enable users to better manage energy consumption").

[31] *See, e.g*., Pacific Gas & Electric, *PG&E's Smart Thermostat Trial*, http://www.pge.com/myhome/saveenergymoney/smartthermostattrial/ (describing customer

empowering consumers to make smarter energy decisions.[34] Similarly, modems and routers are essential for machine to machine (M2M) communications and the Internet of Things (IoT), which are opening new avenues for increased energy efficiency.[35]

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trial of an "innovative thermostat solution, which allows customers to program and monitor heating and cooling energy usage, not just from the thermostat itself, but also remotely via internet-connected devices like smartphones"); Press Release, Comverge, Inc., *Comverge Announces Advanced Applications for Demand Management Optimization* (Jan. 28, 2014), http://www.comverge.com/newsroom/comverge-press-releases/2014/Comverge-Announces-Advanced-Applications-for-Deman (announcing retail device aggregation platform that works in conjunction with Wi-Fi enabled smart thermostats, control switches and other grid-connected devices); Katherine Tweed, *Technology Choice Is Finally Coming to Residential Demand Response*, Greentech Media, Inc. (Jan. 30, 2014), http://www.greentechmedia.com/articles/read/bring-your-own-thermostat-platforms-proliferate-at-distributech (discussing the convergence of demand response and energy efficiency in the residential market).

[32] *See, e.g.*, CPUC, *California Smart Grid – 2012: Report to the Governor and the Legislature* (May 2013), *available at* http://www.cpuc.ca.gov/NR/rdonlyres/7AB03474-E27C-4EB6-AB8D-D610A649C029/0/SmartGridAnnualReport2012Final.pdf (discussing ongoing Smart Grid initiatives, including directing California utilities in 2012 to activate Home Area Network (HAN) capabilities); Press Release, Comcast, *Comcast Launches New Xfinity Home Control and Energy Management Service* (June 10, 2013), http://corporate.comcast.com/news-information/news-feed/comcast-launches-new-xfinity-home-control-and-energy-management-service-2 (announcing new smart home solutions, including video monitoring and remote scheduling and access to lighting and thermostat controls); Cisco, *Bringing the Smart Grid Into the Home: The Value of Home Energy Management for Utilities* (2010) at 5, *available at* http://poweronltd.ca/wp-content/uploads/2011/03/Bringing-the-Smart-Grid-into-the-Home.pdf (diagramming home energy solution architecture by which home energy controller, smart appliances, thermostat, and other devices are connected via Wi-Fi or other means via a home area network).

[33] *See, e.g.*, Jeff St. John, *Whirlpool Launches the Wi-Fi Smart Appliance*, Greentech Media, Inc. (Apr. 25, 2013), http://www.greentechmedia.com/articles/read/whirlpool-launches-the-wi-fi-smart-appliance (describing new networked appliances that operate on a home Wi-Fi network and Whirlpool's companion My Smart Appliances app).

[34] *National Broadband Plan* at 255 ("Internet connectivity to stand-alone energy displays, multipurpose security and home automation systems, televisions, computers and smartphones enables consumers to see more information (e.g. weather conditions, energy prices, bills-to-date) and make smarter decisions about energy use"); *see also* Steven Castle, *Smart Grid and HAN: How Will It Work?*, GreenTech Advocates (Feb. 29, 2012), http://greentechadvocates.com/2012/02/29/smart-grid-and-han-how-will-it-work/ ("We could

The CEC should exercise great caution to avoid disrupting this innovative environment. There is much at stake here, in California, nationwide and worldwide. These successes should not be taken for granted. Even seemingly minor incursions on broadband and technology companies' flexibility could lead to vastly detrimental damage. If Internet growth lags by just two percent, it amounts to lost growth of no less than $100 billion.[36]

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also see big service providers offer HAN services for large utility smart grid rollouts. ADT, Comcast, Verizon, Vivint, Alarm.com and others offer security and connectivity packages of wireless home networking products, including some basic energy management. . . . A Green Button initiative among utilities and already in use by PG&E and SDG&E allow their customers Internet downloads of their energy usage by the hour, and is intended to spawn innovative energy monitoring and management apps."); Steven Castle, *2012 The Year of Smart Appliances?*, GreenTech Advocates (Jan. 19, 2012), http://greentechadvocates.com/2012/01/19/2012-the-year-of-smart-appliances/ (quoting Warwick Stirling, Global Director of Energy and Sustainability at Whirlpool, who said, "Real innovation will be in the cloud. You'll be able to manage communications between devices," and Kent Dickson, chief technology officer of energy management smart grid company Tendril, who suggested that "The real advantage is that now appliances are communicating. If we're able to do that, then the 'smart home' is possible.").

[35] *See, e.g.*, Joel Barbier, Puneet Kumar Bhatia & Divya Kapoor, *Internet of Everything in ASEAN: Driving Value and Opportunity in Oil and Gas, Utilities, and Transportation*, Cisco (2014), http://www.cisco.com/web/about/ac79/innov/IoE.html (introducing the "Internet of Everything (IoE) — the networked connection of people, process, data, and things" and explaining that "IoE enablers for utility companies include integrated network architecture, smart sensors and meters, and private cloud computing"); Verizon Enterprise Solutions, *Connected Machines. Unlocked Potential*, http://www.verizonenterprise.com/solutions/connected-machines/ (describing "machine-to-machine technology (M2M)" and noting that "[u]tility and energy companies are preparing for a data-rich, M2M-driven future. But even more importantly, they're generating intelligence and positive results today with smart meter and grid solutions from Verizon"); Jennifer Hicks, *Machine-To-Machine Market Poised For Take Off*, Forbes (Jan. 14, 2014), http://www.forbes.com/sites/jenniferhicks/2014/01/14/machine-to-machine-market-poised-for-take-off/ (describing M2M networks and quoting Nora Goodman, a global digital strategist, who says, "The value to the customer will be in the ability to tap into the connection and monitoring brain from any remote access point and from a single driven home-hub. Now, sooner than later, our connected home with our all major appliances and wired home systems, will to be as *de rigueur* as our toasters").

[36] Aronson CFEE Remarks.

D. The Proposed Regulatory Approach to SNE Energy Efficiency is Based on Legacy Technology that Does Not Accommodate Competition in Broadband Services or the Current and Future Functionalities of Broadband Equipment

Much of the fuel for the broadband revolution comes from the competitive market in which the service providers operate. Network equipment is typically provided as part of a "triple play" subscription package of video, data, and voice services. In ***video***, cable, telco, and satellite providers race each other to provide more HD channels; capacity to simultaneously record more and more channels; more on-demand programs; more digital video recording storage; more "apps" and the increased processing power and memory they need; multi-room playback and home networking of content; remote programming of recordings; ultraHD content; and enabling consumers to view subscription content on a variety of portable consumer electronics devices. In ***data***, cable broadband displaced dial-up and the second line, competes vigorously with DSL and fiber, and handles much of the wired "offload" required for wireless services to work; and the race is underway to ever increasing speeds, throughput and support for more broadband video and advanced services like security and telemedicine. In ***voice***, the cable industry successfully challenged the voice monopoly with VoIP offerings to consumers. This rapid cycle of competitive innovation in services necessitates rapid innovation in network equipment, which operates as part of a bundle of services and not as isolated pieces of equipment. The promise of continued enormous consumer benefits would be jeopardized if equipment innovation could not keep pace with consumer demand for innovation in services.

The cable operator/ISP is a service provider that is held accountable for the features it markets. Broadband service offerings are typically offered in tiered levels, measured by downstream speeds, such as 25, 50, or 100 Mbps service. Most cable operators require DOCSIS 3.x modems to achieve the higher advertised speeds. The vast majority of broadband modems are purchased wholesale by service providers and then leased to consumers as part of a monthly service package. Consumers may return the equipment when they change service plans or service providers, and the equipment may then be redeployed by the service provider to a new customer. While service providers also permit retail modems and integrated access devices (IADs) to be used, not all devices sold at retail are capable of delivering the advertised service to the home. If a service provider markets Internet speed, the FCC holds the service provider accountable for meeting those speeds even if the consumer uses a retail modem, and the FCC encourages service providers to move its customers to higher performing models of equipment.[37]

[37] FCC, 2012 Measuring Broadband America – July Report, A Report on Consumer Wireline Broadband Performance in the U.S., at 7, http://transition.fcc.gov/cgb/measuringbroadbandreport/2012/Measuring-Broadband-America.pdf ("End to end performance may depend upon customer provided modems terminating Internet service and this can become an obstacle in planned service evolutions by ISPs. For example, 'legacy' equipment may impede some panelists from receiving the subscribed speed from their ISP, and the presence of this equipment at a panelist's location can prevent the ISP from controlling the broadband performance to the panelist's home. We hope through a combination of the availability of high speed Internet services, compelling

Major Internet service providers "white list" approved customer-owned devices that can support advertised service, and the "white list" criteria change as broadband services are upgraded and customer expectations rise.

Broadband speeds in the U.S. have increased 32 fold in the past seven years. Eighty-five percent of U.S. households have access to networks capable of 100 Mbps, and American broadband users now typically enjoy 97 percent of advertised speeds. In the past two years alone, the broadband industry has collectively invested over $120 billion in research, equipment and people in providing faster speeds, wider availability, and greater customer choice. It shows no sign of reducing those investments. Broadband cable modems and IADs are integrated parts of complex and rapidly-changing data networks supporting tiered and rising Internet speeds and new IP experiences, typically provided as part of a "triple play" subscription package of video, voice, and data services. Broadband offerings are changing so fast that one cannot even project all features that will be present in 5 years.

To date, the CEC has not received or proposed any regulatory approach that can accommodate this extraordinary broadband market. Any model for efficiency must accommodate use and functionalities required not only today, but for tomorrow, and standards cannot eliminate the continued evolution of technology. Yet the IOU proposal has focused on a traditional energy efficiency model grounded in analytical tools developed for appliances like white goods that operate as single, standalone objects that consumers buy and own, and rarely replace. Such commodities perform basically one function, have infrequent design changes, and remain static in consumers' homes over a long lifetime. One can project forward 5 years and tell factories how to build them. This is the analytical model that the IOUs and NRDC propose to apply to broadband network equipment.

CEC staff recognized in its workshop and Request for Information that there were fundamental questions left unanswered in the IOU proposal, such as why one network device consumes less energy than another, and how such differences may affect costs and product performance. In fact, it was the failure of the IOUs to confront these fundamental questions that has led them to propose standards that utterly fail to support the current broadband market and future innovations.

The IOU proposal assumes that modems and routers perform one base function and vary in energy usage based only on the number and type of input (WAN) and output (LAN) interfaces. As a result, the IOUs propose that a cable modem should be provided with one fixed base allowance regardless of the network speed supported, and functional adders should be provided only for the number and type of Ethernet or FXS ports output to the LAN. This is a

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applications utilizing these services, and increased consumer awareness, that consumers will make the changes required to effectively use these high speed services, enabling them to enjoy the full benefits that they offer."). FCC, 2013 Measuring Broadband America – February Report, A Report on Consumer Wireline Broadband Performance in the U.S., at 8 http://transition.fcc.gov/cgb/measuringbroadbandreport/2013/Measuring-Broadband-America-feb-2013.pdf.

fundamentally flawed view of broadband services and equipment. Broadband network equipment like cable modems and IADs are being designed for a vast array of new features that the IOUs, and their proposed standards, have completely ignored. Among the features that must be accounted for are:

- Channel bonding using DOCSIS 3.0 (D3) for increased throughput and more efficient network operation. A D3 modem is the technology that allows cable operators to offer competitive speed tiers and is the foundation technology for meeting the FCC's goal of expanding the capacity and reach of high speed Internet access. A DOCSIS 2 (D2) modem does not support such speeds. D3 modems also alleviate network congestion and optimize utilization by spreading data across more than one QAM, recovering approximately ten percent (10%) more capacity from each QAM than D2 modems. D2 modems impose network costs through inefficient use of network capacity.

- New WAN technologies such as DOCSIS 3.1.

- More resources in an IAD to power the distribution of video (rather than merely data) with assured coverage through the whole home.

- Robustness to prevent interruption of service and security. Interruption of service generates consumer complaints in a market with competitors that are constantly offering incentives for consumers to switch providers.

- Faster application processor, for example, to support video streaming.

- LAN support for a large number of client devices in the home.

- Support for new WAN interface types, such as Ethernet WAN and LTE.

- Support for new and more simultaneous LAN interface types, such as Bluetooth, Zigbee, 802.11ac, HPNA, MoCA, multiple SSIDs, and other new wireless applications and technologies.

- More memory to support anticipated third party applications, OSGI stacks, and more.

- Integrated storage.

- Internal battery backup. Many cable operators use Lithium Ion (Li-ion) batteries installed in modems at the customer premise to provide power back-up for VoIP service. Accommodating a battery adds extra electronics and more power requirements to the device.

Absolutely nothing in the IOU and NRDC proposal accounts for these different functionalities or the need to quickly evolve technology to meet consumer demands. Nor are there any proposed allowances sufficient to reflect such uses. Instead, the IOUs simply base their proposal on a sample of devices they claim are compliant with their proposed energy metrics and are "in general, slightly higher featured than non compliant products."[38] The IOUs and NRDC further claim that their proposal would bring all devices up to levels that are achievable by the best technology, and that 17 percent of devices already in the home can meet their proposed standards.[39] A closer look reveals these claims to be completely unfounded.

The IOU and NRDC proposal is based on legacy technology that does not meet today's requirements, let alone tomorrow's. Of the eight cable IADs tested, only two met the IOU proposed standard.[40] Both are D2 devices with maximum data rates that do not support today's broadband offerings. Charter's *minimum* speed is 30 Mbps today and is moving to 60 Mbps by the end of 2014. Speeds of 100 Mbps are routinely offered by Comcast, Time Warner Cable, Cox, Charter, and Bright House. None of the "compliant" IADs appear on cable operator white lists of approved or recommended devices that support today's services.

The IOU and NRDC proposal is equally deficient when it comes to modems. The IOUs and NRDC report that only three of the ten modems tested operated at or below 5.7 watts.[41] But two of these are vintage 2009, DOCSIS 2.0 devices that cannot meet DOCSIS 3.0 throughput standards. [42] One is specifically listed on cable white lists as "not recommended"[43] and on a consumer review site as "a piece of junk" with "old firmware that could not be upgraded."[44] The third is a D3 modem that does appear on one white list,[45] but it operates only in 4x4 mode[46] and lacks telephony interfaces and internal battery backup.

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[38] IOU Proposal at 22.

[39] *Id.* at 1, 22, 29. NRDC Proposal at 1, 8; NRDC, Small Network Equipment Energy Consumption in U.S. Homes (June 2013) ("NRDC Issue Paper"), http://www.nrdc.org/energy/files/residential-network-IP.pdf.

[40] NRDC Issue Paper at 15-16 (Cisco DPR2320 and ARRIS TM302G).

[41] *Id.* at 15-16 (RCA DCM425, Ubee U10C018.80, and ARRIS WBM760A).

[42] *Id*. at 15-16 (RCA DCM425 and Ubee U10C018.80).

[43] Cox Communications, Cox Compatible Cable Modems, http://ww2.cox.com/residential/support/internet/article.cox?articleId=b2ec95d0-7ef9-11df-5590-000000000000.

[44]Amazon.com Customer Reviews for RCA DCM425, http://www.amazon.com/RCA-DCM425-Digital-Cable-Modem/product-reviews/B0009IRUKG.

[45] ARRIS WBM760A. Comcast, Xfinity DOCSIS Device Information Center, http://mydeviceinfo.comcast.net/.

[46] Many cable operators are moving to modems that are capable of bonding 16 channels (16x4), which supports today's advanced broadband speeds, rather than only 4 channels (4x4).

In short, not one of the supposedly "compliant" devices using "higher featured" technology can meet the standards required in today's competitive marketplace. The proposed standard would not, as the IOUs claim, "enable products with the newest features to comply."[47] For example, a DOCSIS 3.0 24x8 cable modem Multimedia Terminal Adapter (MTA) that supports VoIP and includes Wi-Fi and MoCA home networking interfaces requires over 20 Watts in idle. The IOU proposal would cap it at 4.2 Watts. Nor would the standard proposed by the IOUs and NRDC leave room for the critical functionalities soon to be provided by these devices. By pursuing a model grounded in static commodity appliances disconnected from complex networks and actual service offerings, the IOUs' proposal would choke off the very tools that service providers require for powering and advancing the broadband revolution.

If the Commission applies its appliance model to the broadband equipment marketplace, it would end up with energy standards set for yesterday's services. New consumer services would be put on hold while the Commission considers rule changes or waivers to accommodate delivery of those new services. Innovation, consumer choice, and competition would be stifled as manufacturers and ISPs would remain handcuffed to outdated rules that, by the nature of the regulatory process, cannot quickly be changed. The IOU proposal does not support technological feasibility or product efficacy because it makes no provision for these functionalities.

Requiring a rulemaking or waiver before launching new features or services would stymie not only rapid innovation and the timely introduction of competitive features, but also the effective functioning of the broadband market altogether. Being the "first mover" of a new feature or service is often critical to success, and so innovators will not want to reveal the details of new designs to the public through a public proceeding, much less wait months or more for permission to proceed. If providers and manufacturers cannot innovate rapidly because Commission rules have intervened, then consumer choice, investment and competition would suffer.

Pursuing the IOU proposed approach would stymie consumer services and innovation.

E. The Proposed Regulatory Approach to SNE Energy Efficiency Ignores the Industry's Incentives to Use Energy Efficient SNE

Unlike a retail store selling an appliance to a consumer, the cable operator/ISP is a service provider with a continuing customer support relationship and continued ownership of the equipment. It incurs significant capital costs to acquire and maintain this premises equipment. This continuing ownership and relationship provides powerful incentives for the service provider to provide equipment designed for reliability, resilience, longevity, and the capability of supporting a broad array of future services on the service provider's horizon. This also creates incentives for service providers to deploy equipment that conserves energy.

[47] IOU Proposal at 22.

For example, cable operators buy power supplies separate from the device. These supplies are more expensive as device power needs increase. The business incentive is to purchase energy efficient modems and IADs and thereby reduce the expense of power supplies.

As another example, the specialized cable modems that support VoIP often include internal battery backup, and battery backup gets more expensive as power needs increase. The business incentive is to purchase energy efficient devices and reduce the expense of internal batteries.

As a third example, no fans are included in today's modems, in order to reduce noise. But unlike set-top boxes, which tend to be placed in open environments near televisions, modems are often put in closets and confined spaces. The business incentive is to purchase energy efficient devices to reduce heat, increase safety, and promote device longevity.

Finally, multi-function gateways that support video plus data and/or voice are already subject to the Voluntary Agreement committing the industry to energy efficiency in set-top boxes and in whole home gateway devices, with video, DOCSIS and routing included. Because service providers have compliance programs under the VA and professional buyers to enforce efficiencies from suppliers, they are fully empowered and motivated to settle for no less in data gateways.

F. The Commission Should Not Impose Standards on SNE and Should Allow the Voluntary Agreement to Provide the Path Forward

In December 2013, the U.S. Energy Department (DOE), NRDC, the American Council for an Energy-Efficient Economy (ACEEE), the Appliance Standards Awareness Project (ASAP), the Consumer Electronics Association (CEA) and NCTA announced voluntary energy efficiency standards for pay-TV set-top boxes that will result in significant energy savings for more than 90 million U.S. homes covering more than 90 percent of the pay-TV industry.[48] In a press release applauding this Voluntary Agreement, Senator Feinstein stated, "Today's voluntary announcement demonstrates the television industry took this matter seriously, and I commend industry and efficiency advocates for agreeing to make 90 percent of all set-top boxes as efficient

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[48] DOE, U.S. Energy Department, Pay-Television Industry and Energy Efficiency Groups Announce Set-Top Box Energy Conservation Agreement; Will Cut Energy Use For 90 Million U.S. Households; Save Consumers Billions (Dec. 23, 2013), http://energy.gov/articles/us-energy-department-pay-television-industry-and-energy-efficiency-groups-announce-set-top. Industry signatories include pay-TV providers (listed according to number of customers) Comcast, DIRECTV, DISH Network, Time Warner Cable, AT&T, Verizon, Cox Communications, Charter Communications, Cablevision Systems Corp., Bright House Networks, and CenturyLink; and manufacturers ARRIS (including Motorola), Cisco, EchoStar Technologies, and Pace. Energy efficiency advocates NRDC, the American Council for an Energy-Efficient Economy (ACEEE), and the Appliance Standards Awareness Project (ASAP) are also signatories to the agreement. The Voluntary Agreement is available at http://www.ncta.com/energyagreement.

as today's most energy efficient boxes by 2017. This will cut box energy consumption by 10-45 percent and save consumers $1 billion per year. To put that in perspective, this amount of energy savings would eliminate the need for three power plants and prevent 5 million tons of CO_2 emissions per year. This is a big win for nearly every American who pays a monthly television bill because experts tell me that federal standards could not have produced this much financial and energy savings by 2017."[49]

The Voluntary Agreement provides a framework for the pay-TV industry and energy efficiency advocates to work together to deliver dramatic energy efficiency gains that keep pace with technological innovation, faster and more flexibly than regulatory approaches. The agreement assures energy efficiency without retarding competition, first mover advantage, or innovation without permission. It is already securing energy savings and can adapt quickly and flexibly to changes in technology and the market to seize new opportunities for energy efficiency. It avoids the many risks of state government intervention: erosion of the consumer benefits from rapid innovation, reduction in the efficacy of broadband devices and services, suppression of new services and competition, and fractured and inconsistent state rules that hobble the continued development of an efficient market for broadband.

Energy Secretary Ernest Moniz praised the "collaborative approach" and "common-sense efficiency standards," explaining that "The set-top box efficiency standards will save families money by saving energy, while delivering high quality appliances for consumers that keep pace with technological innovation." Noting that the Department of Energy encourages the development of market-based solutions such as the VA, the DOE on December 31, 2013 withdrew its proposed rule to determine set-top boxes and network equipment as covered products subject to regulation.[50]

The expanded Voluntary Agreement includes a specific provision committing the parties to address small networking equipment such as residential modems and routers. Work is now underway to craft SNE energy efficiency measures that could be adopted on a national basis and also allow for rapid innovation in the equipment that supports Internet and broadband services. Yet the CEC appears to be moving instead toward a California-only regulatory model. The CEC and consumers have far more to gain – in immediate energy savings, innovation, and competition – than to lose by giving the Voluntary Agreement a chance to work.

[49] Press Release, Sen. Dianne Feinstein, Feinstein Statement on Energy Efficient Set-Top Boxes (Dec. 23, 2013), *available at* http://www.feinstein.senate.gov/public/index.cfm/press-releases?ID=61fc7d89-6d9b-45e3-95f8-876de78ed6d8.
[50] Energy Conservation Program: Proposed Determination of Set-Top Boxes and Network Equipment as a Covered Consumer Product, 78 Fed Reg. 79649 (Dec. 31, 2013).

For these reasons, the Commission should decline to impose standards or other regulations on small network equipment.

Respectfully submitted,

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