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Mr. Robert Meyers
ENERGY STAR Product Development
U.S. Environmental Protection Agency
Energy Star for Office Equipment
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: TIA Industry Comments: Energy STAR LNE Specification

Dear Mr. Meyers:

The Telecommunications Industry Association (TIA) hereby submits the following industry comments regarding the proposed scope and testing methodology for the draft ENERGY STAR Large Network Equipment (LNE) Specification Version 1.0 Framework Document and Draft 1 Test Method.¹

TIA and our member companies are very supportive of the ENERGY STAR program as an effective public-private partnership that enables recognition of energy efficiency technology leaders while allowing companies to innovate next generation technologies. TIA and our member companies are highly committed and engaged in addressing and improving the energy efficiency of network equipment. Over the last several years of standards development, energy efficiency research, and meeting increasing energy efficiency demands of network equipment customers, industry has discovered some significant challenges in comparing the energy efficiency of network equipment serving a large variety of network equipment domains that are highly relevant to the development of the ENERGY STAR LNE specification.

TIA believes that at this point setting minimum ENERGY STAR qualification levels for either fixed or modular network equipment will likely result in a failed specification. At this stage, TIA strongly recommends that EPA utilize a test and report requirement for equipment covered in the scope of the LNE Specification. A test and report requirement will succeed in recognizing leaders in energy efficiency while educating entities procuring equipment in the scope of the LNE specification regarding the energy usage of equipment. TIA offers the following input in support of a test and report requirement for equipment covered under the LNE specification.

¹ See ENERGY STAR Large Network Equipment Specification Version 1.0 Framework Document, available at www.energystar.gov/products/specs/large_network_equipment_specification_version_1_0_pd.

- 1. TIA strongly recommends that EPA utilize a test and report requirement for network equipment covered under the ENERGY STAR LNE specification. ENERGY STAR levels should not be set for either fixed or modular network equipment.**

TIA supports the development of an ENERGY STAR specification for Large Network Equipment that serves as an effective and standard tool to educate purchasers about the energy efficiency of network equipment. The goal of the ENERGY STAR program is to increase the use of the most energy efficient products, and TIA believes the ENERGY STAR LNE specification will be most successful in achieving this goal by educating customers regarding the energy usage of the products covered under the specification. The current proposal in the Framework Document is to set minimum ENERGY STAR qualification levels for fixed network equipment and to require testing and reporting for modular network equipment. The Framework Document draft states the following with regard to modular network equipment:

EPA is proposing to include modular products in the Version 1.0 LNE specification, but recognizes that these products are typically more complex and that the testing method and eligibility requirements for them may be different from that used for fixed products. EPA is proposing to collect and display efficiency measurements of modular equipment, but not set levels for these products in the Version 1.0 LNE specification. This approach would mirror the ENERGY STAR Version 2.0 Computer Servers specification for three and four socket servers, blade systems, and multi-node systems.²

TIA strongly recommends that the EPA not set levels for fixed network equipment. A test and report requirement for both fixed and modular equipment will provide buyers with information to identify the most energy efficient products while maintaining the intelligence of the person procuring the equipment to fit network equipment to the specific needs of the system. For modular equipment, TIA agrees that the more complex and configured nature of modular network equipment makes the development of an ENERGY STAR qualification level impossible for this product category. For fixed equipment as well, setting an ENERGY STAR level is extremely problematic.

- 2. Too much variability between both hardware and software of fixed network equipment and inherent differences in energy utilization among different types of networked systems will make it difficult if not impossible to make fair comparisons between comparable equipment for the purpose of setting minimum qualification levels.**

The ENERGY STAR program's Strategic Vision states one of ENERGY STAR's objectives to reduce greenhouse gas emissions as "Establishing a common, objective basis for

² See ENERGY STAR LNE Framework Document, p. 4 (June 2013), available at www.energystar.gov/products/specs/sites/products/files/ENERGY%20STAR%20LNE%20Framework%20Document.pdf.

defining what constitutes high efficiency for a particular product type.”³ Meeting this objective for the purpose of setting minimum levels requires testing energy usage of products and making fair comparisons between comparable equipment based on performance and energy consumed. Network equipment, both fixed and modular, presents significant challenges beyond other products covered by the ENERGY STAR program in making fair comparisons between comparable equipment because of the inherent differences in energy utilization among different types of networked systems.

Fixed network equipment serves a broad and varied market of users with diverse performance requirements based on the system being operated. If the LNE specification includes a broad variety of fixed network equipment, the data set will be comparing products that are too dissimilar in performance to make fair comparisons. An accurate data set for the purposes of setting a limit would require that the number of products in the data set be narrowed to the point that the specification would lack an inadequate number of comparable devices to achieve a statistically significant base.

Fixed network equipment is integrated into a wide variety of network systems including enterprise organizations (healthcare, financial, campus), public safety agencies (police, fire military), large commercial entities (utilities, petrochemical), data centers and service providers. Each network system domain will have its own specific performance requirements, which require different configurations and energy usage of the fixed network equipment integrated into the system. Examining the energy usage of a single piece of fixed network equipment in isolation from the system in which it operates will not provide an accurate enough representation of energy usage in the context of the performance requirements it must meet to enable a fair comparison with other network equipment. Setting minimum qualification levels for individual pieces of fixed network equipment based on usage scenarios that do not accurately reflect their required deployment will result in higher net energy use in the vast majority of situations.

3. Setting minimum levels for fixed network equipment will result in only the most basic routers meeting minimum performance requirements qualifying for the ENERGY STAR label, disqualifying routers that must meet more demanding performance requirements from the ENERGY STAR program.

The result of setting minimum levels will be that only the most basic network equipment and equipment with minimal performance requirements will qualify for an ENERGY STAR label, which will cause significant confusion and problems for customers buying fixed network equipment that has more demanding performance requirements.

As one example, fixed network equipment, specifically off-the-shelf routers, are often deployed in real-time voice communications systems. The market for these systems is typically first responder public safety agencies (police, fire, military) and large commercial operations (utilities, petrochemical) with demanding communications performance requirements. Communications systems used in these mission critical applications have unique performance

³ See ENERGY STAR Products Program Strategic Vision and Guiding Principles (May 2012), available at: www.energystar.gov/ia/partners/prod_development/downloads/ENERGY_STAR_Strategic_Vision_and_Guiding_Principles.pdf?6684-6ef9.

requirements that impact the energy use profile of the off-the-shelf equipment. Optimizing system response time, the time from when a push-to-talk button is pressed until the system establishes the communication link and allows speech to begin, is a critical factor for real-time communications systems. A piece of fixed network equipment that meets these performance requirements would likely not meet minimum energy levels and would therefore not qualify for an ENERGY STAR label, leaving a purchaser of this type of system the choice of either buying a system that does not meet its performance requirements, seeking a waiver from an ENERGY STAR procurement requirement, or ignoring the specification altogether.

Similarly, setting minimum levels for fixed network equipment is also complicated by the fact that equipment in this category, beyond the most basic equipment, would likely not qualify for adders. TIA is concerned for example that the specification is considering a requirement to implement the IEEE 802.3az standard in the LNE specification. Vendors providing systems such as real time communications embed hosts that are continually communicating, resulting in no real efficiency gained by placing ports into sleep mode. Vendor solutions may disable ports that are unused, but enabled ports are never and can never be inactive to meet network demand requirements. Past attempts by manufacturers to implement sleep modes into these types of systems have proven unworkable. Like fixed network equipment for many network systems, modular network equipment also cannot support any type of requirement for sleep mode as these types of devices commonly incorporate features such as advanced encryption, failure mode protection and system recovery aspects. Forcing a sleep mode into the system adds cost and complexity that by design could never be used based on the performance requirements of many users.

Additionally, the definition of Idle State used in the LNE specification becomes critical for fixed network equipment beyond the most basic network equipment meeting the specification requirement. The definition for “Idle State” provided in the framework document does not include the length of time the device must be not actively transferring data before it is considered “idle” and not “active.” Idle expectations would need to be clearly defined. For equipment and devices being used in mission critical applications such as police, fire, emergency response, any proposed limit on the power level allowed in an “Idle State” is of significant concern as this could result in an adverse impact on system response time coming out of an idle state.

4. A test and report requirement for the LNE specification will inform purchasers of which network equipment solution is the most efficient.

Purchasers of network equipment within the scope of the LNE specification are sophisticated and in the best position to assess the current and future performance requirements of their network systems. A test and report requirement through the ENERGY STAR LNE specification will provide these purchasers with a clear view of which products are the most efficient, which will directly impact their purchasing decision. Setting a minimum qualification level for fixed network equipment that only the most basic network equipment can meet will limit the intelligence of the purchaser to procure equipment that both meets the performance requirements of the system and is energy efficient. The IT professional would likely seek a waiver from ENERGY STAR procurement requirements if applicable or ignore the specification

in order to meet the performance requirements of the system, which significantly impairs the utility of the specification.

5. Setting an ENERGY STAR level for fixed network equipment, in many cases would result in increased power consumption.

In some cases, setting minimum ENERGY STAR levels would result in the unintended consequence of increasing energy consumption by requiring an agency to procure individual network equipment that meets the minimum ENERGY STAR threshold but when used in the system results in greater energy consumption.

For example, systems with the same edge port configuration but different uplink options will score differently on an efficiency test. It is inevitable that fixed levels applied across the various configurations will either result in systems with high speed uplinks being passed while those with low speed uplinks fail, or else vice-versa. In the first case, a network deployment that uses ENERGY STAR certified equipment that meets a minimum set level will use more energy for unnecessarily high speed uplinks. In the second case, a network deployment that uses ENERGY STAR certified equipment will have to reduce the number of edge ports per uplink to achieve the necessary performance, thus using more energy per connection.

As another example, systems using the same family of devices to provide functionality are generally available with varying numbers of edge ports per unit. It is inevitable that fixed levels applied across these configurations will result in systems with more edge ports per unit being passed while those with less ports per unit fail, or else vice-versa. In the first case, a network deployment that uses ENERGY STAR certified equipment will use high-port count systems where the required number of connections is low, thus wasting energy. In the other case the network deployment will use multiple low-port-count units to connect devices that would be better served by a single high-port-count unit.

Finally, if explicit testing is conducted for PoE source efficiency and fixed efficiency levels are defined, then it is inevitable that the efficiency measure will favor either high-power PoE sources over low power systems or vice-versa. In the first case, PoE power sources will be used in scenarios where the load is insufficient to operate in the efficient range for the power supplies. In the second case, more PoE power sources will be needed for heavy loads, wasting energy on duplication of system overheads and switching resources.

6. Setting ENERGY STAR levels for fixed network equipment will not accelerate the innovation of more energy efficient network equipment as significantly as a test and report requirement.

As explained above, TIA is concerned that setting ENERGY STAR levels for the LNE specification will result in only the most basic network equipment meeting the qualification threshold while network equipment meeting more robust performance requirements would be excluded. This results in only basic network equipment receiving recognition through the ENERGY STAR program. A test and report requirement would result in effective coverage of

more network equipment under ENERGY STAR and provide purchasers with more information regarding the energy efficiency of equipment.

A test and report requirement through the LNE specification will complement other existing energy efficiency initiatives already under way. Industry continues to make significant gains in improving the energy efficiency of ICT equipment while meeting ever increasing network demands. The GreenTouch initiative, as one example, has the goal to identify and deliver the architecture, specifications, and technologies and demonstrate key components needed to increase network energy efficiency by a factor of 1000 compared to 2010 levels. Redirecting industry focus on meeting minimum energy efficiency levels of basic network equipment will distract from ongoing energy efficiency efforts that could result in greater energy savings. The best path for the ENERGY STAR specification is to help educate purchasers procuring large network equipment regarding the energy efficiency of products through a test and report requirement.

CONCLUSION

TIA appreciates the opportunity to provide additional input to the EPA regarding the LNE specification and looks forward to continuing to work with the EPA and other stakeholders moving forward.

Respectfully submitted,

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