Index	Topic	Stakeholder Comment	EPA/DOE Response
1	Definitions - SNE vs. LNE	Stakeholders questioned the distinction between Small Network Equipment (SNE) and Large Network Equipment (LNE) based on port count (11). Stakeholders gave examples of 10 x 10Gbit/sec ports that do not fit well in SNE but are currently defined as such. Some stakeholders suggested performance should be the differentiator for all network products, rather than a feature based approach in SNE.	EPA proposes to maintain the current distinction between small network equipment (SNE) and large network equipment (LNE) as defined in both the Version 1.0 SNE specification and LNE framework document. EPA believes that the example product with 10 x 10GbE ports would likely be rack mounted, and fall under the LNE scope despite it's port count being less than 12.
2	Definitions - SNE vs. LNE	Stakeholders requested a clear diagram that shows both SNE and LNE products	EPA will investigate creating a diagram that shows the scope of both SNE and LNE products in the upcoming Version 1.0 Draft 1 LNE Specification. At this time the Version 1.0 SNE Program Requirements will be finalized which will make the creation of this diagram more clear.
3	Definitions - LNE	One stakeholder asked how can LNE treat a product as a single device when it may perform multiple duties? For example a DHCP switch with security functionality?	The Draft 1 Test Method targets two LNE functionalities: 1. directing network traffic; and 2. providing Power over Ethernet (PoE). If a product is capable of performing other functions (e.g., DHCP server, security, etc.), these functions will not be verified or demonstrated during testing. If a product uses more energy due to the availability of other features, then specification limits can be adjusted for qualification.
4	Definitions - Security Appliances and Access Point Controllers	Stakeholders requested that the definitions of security appliances and access point controllers be clarified.	EPA welcomes additional industry proposals on definitions for both of these terms to help clarify which products will be out of scope for Version 1.0.
5	Definition - Idle	One stakeholder stated that idle equipment must be able to immediately transition to full traffic without causing significant performance degradation. They also state Idle. vs. sleep expectations must be explicitly defined as they greatly impact efficiency operations and Quality of Service (QoS).	DOE agrees that it is important for an LNE product to be capable of responding to traffic while in an idle state. Therefore, the Idle test run has been replaced with a Very Low Utilization test run in the Draft 1 Test Method. This test places the Unit Under Test (UUT) in a state that is almost idle, but all ports must still process sporadic traffic. Although this may not demonstrate a device's capability to transition to full traffic while in idle, it does require a device to be capable of processing traffic while in a nearly-idle state.
6	Scope - Inclusion	Several stakeholders suggested the scope should only include Ethernet routers and switches in Version 1 (V1) of ENERGY STAR for Large Network Equipment .	EPA generally agrees with limiting the scope of Version 1.0 to routers and switches, though details have yet to be finalized on scope at this time.
7	Scope - Inclusion	One stakeholder stated that software defined networks (SDN) need to be considered in V1. This stakeholder recommends referencing the latest ATIS and ETSI standards in addressing this developing area within the Information and Communications Technology industry (ICT).	SDN does generally use more power than standard networking because decisions that are normally made close to the port may need to be made higher up in the device. EPA is uncertain which aspect of SDN should be considered for Version 1.0; switches and routers that can receive SDN directives or supervisory boxes (likely not LNE equipment). EPA welcomes additional stakeholder feedback on this topic.
8	Scope - Exclusion	Several stakeholders agreed with removing security appliances and wireless access point controllers from scope	EPA proposes to exclude products who primary function is security or operating as an access point controller. Further investigation may be needed to address products that offer these features as a secondary function.

9	Scope - Exclusion	Several stakeholders suggested removing storage networking from scope, but one major stakeholder requested that storage switches be included in a separate category and that they could provide definitions and test criteria for these products if needed.	EPA would like to see what additional information stakeholders can provide in terms of definitions and information on market size and diversity before making the decision to remove these products from the scope of Version 1.0.
10	Scope - Exclusion	One stakeholder requested that embedded blade/sever switches be excluded from scope as their power consumption is already addressed in the computer server specification	EPA agrees with this exclusion.
11	Scope - Exclusion	One stakeholder requested the exclusion of the following: optical transport, cellular base stations, DSLAMs, ROADMs, cable equipment, and HPC interconnects (infiniband)	EPA agrees with this exclusion.
12	Scope - Exclusion	One stakeholder suggested that scope of specification should be reduced to general guidance only, and that level setting and specific requirements should not be pursued as the industry is already making strides in energy efficiency	EPA has identified additional potential energy savings in the LNE market beyond what has already been achieved, and is pursuing a Version 1.0 LNE specification to encourage these savings, through the use of general requirements as well as level setting where appropriate.
13	Categorization - General	Several stakeholders suggested two classes and three layers to be covered by LNE: Enterprise and data center classes (2); Access, aggregation, core layers (3)	EPA proposes classification by observable product characteristics, rather than information typically defined in marketing material which may not be consistent between different manufacturers.
14	Categorization - Modular vs. Fixed	Several stakeholders suggested only focusing on fixed systems in V1 due to high configurability of modular/blade systems. One stakeholder noted that fixed systems can be stacked, particularly in the enterprise space, and can become similar to a group of modules in a modular switch. EPA is encouraged to compare performance and characteristics of stacked fixed switches vs. modular switches before removing modular switches from the requirements.	EPA agrees that the focus of Version 1.0 in terms of level setting should be on fixed systems. However, EPA proposing to cover modular products through a data reporting process. EPA believes that stacked switches can operate independently, unlike modular parts of a modular switch, and that the stacked switches can be tested in a standalone state. EPA welcomes stakeholder feedback/data to validate this approach.
15	Categorization - Managed vs. Unmanaged	Several stakeholders asked for clarification regarding the managed vs. unmanaged approaches. One stakeholder noted that managed vs. unmanaged is not a significant issue in LNE.	If stakeholder submitted data shows the need, EPA will create an adder structure for managed switches to provide additional power allowance based on the complexity of the management functions provided.
16	Categorization - Switches	One stakeholder requested separating 1 GB/s and 100GB/s switches into different categories. The stakeholder requested the same for layer 2-3 switches.	EPA does not believe 100GbE switches will have a significant representation in LNE market during the life of Version 1.0. EPA welcomes data to counter this assumption, otherwise this topic can be revisited in Version 2.0 as needed. EPA intends to address additional power consumption of different switch layer technology that provides additional performance if it is found warranted based on stakeholder submitted data. EPA believes that L2 and L3 switches should be tested in the same manner.
17	Categorization - PoE	Several stakeholders stated that Power over Ethernet (PoE) needs to be addressed in LNE, but opinions differed on how. Some wanted PoE in a separate category, while others stated that LNE should cover power sourcing equipment and perhaps mid-span power injectors (because they are not covered in any active spec), but likely not powered units.	DOE agrees that PoE should be addressed and has therefore updated the Draft 1 Test Method to include a PoE Load test. This test allows LNE products to demonstrate their energy use while delivering PoE. EPA will develop PoE requirements in the Draft 1 LNE Specification after reviewing any voluntarily submitted stakeholder data later this year.

18	Energy Efficiency - Power Supply	One stakeholder stated that Power Supply Unit (PSU) requirements in LNE are not necessary because 80+ gold levels are already commonplace in the market and asks that PSU's not be considered independently of the product. Another stakeholder states that PSU efficiency requirements are appropriate for V1.	EPA believes that PSU efficiency is important in modular products, but that in fixed systems, the efficiency of the product as a whole should be the focus.
19	Energy Efficiency - Features	One stakeholder listed that the following energy efficiency features are appropriate for consideration in V1: managing power consumption of product at port level; use of variable speed fans; designs that dynamically scale power use with system utilization; reporting of equipment energy to the network; ability to operate to ASHRAE A2 (80F) or A3 (95F)	The first three items listed are covered under the current test method. Reporting of equipment energy (and possibly temperature) to the network will be considered in the Version 1.0 specification. EPA welcomes additional stakeholder feedback on the feasibility of testing product functionality at higher ASHRAE levels
20	Energy Efficiency - Features	One stakeholder stated that V1 should focus on total energy consumption rather than various energy efficiency features.	EPA will consider energy efficiency features in the Version 1.0 specification.
21	Energy Efficiency - System Level and Reporting	One stakeholder suggested considering system level energy efficiency savings (e.g. EEE and standards based energy management interfaces). Another stakeholder mentioned adopting open standards for power management and energy data availability being developed by the IETF energy management work group (EMAN)	EPA will investigate ways to encourage system level efficiency and adoption of industry created reporting standards as appropriate.
22	Energy Efficiency - System Level	One stakeholder recommended considering downstream impacts of features on other systems reliant on LNE. They state that there can be unintended consequences associated with features (e.g. resume-from-sleep latency may cause network congestion and lower utilization levels in servers)	EPA is not looking to encourage sleep functionality that results in performance degradation in Version 1.0.
23	Metrics - General	A few stakeholders (those with close ties to ATIS) requested that DOE rely on existing industry standards rather than develop new procedures.	DOE understands that a considerable amount of work has already been performed to develop industry test standards such as American National Standard for Telecommunications (ATIS)-0600015.03.2013. However, an ENERGY STAR test method requires comprehensive specificity in order to eliminate procedural ambiguity. Furthermore, there are some features (i.e., Energy Efficient Ethernet and PoE) which may not be adequately addressed by current industry test standards. For this reason DOE will continue to work with stakeholders in order to develop a test method which allows LNE products to accurately demonstrate their energy use. EPA will use ATIS as a reference but will not limit decisions on energy efficiency requirements to the metrics listed in the ATIS standard.
24	Standards - ATIS	Some stakeholders wanted ATIS to be used as is with no modification. Other stakeholders suggested using ATIS as a guideline, and when deviation is necessary, to continue using the principles from ATIS when possible. The major theme was modeling normal usage and comparing it to the maximum useful performance level that can be supported.	EPA intends to limit deviations from the ATIS procedure when possible, but the Version 1.0 energy efficiency requirements may be developed independently of the metrics in the ATIS standard if EPA sees value in doing so.

25	Metrics - TEER	A stakeholder comments that the latest version of TEER (present in ITU-T L.1310, ETSI R&S and also submitted as amendment to ATIS.2009 standard) now includes weighting to the throughput measurements as well as the power measurements. This change allows for the metric to have a "real world" application which can be used as an indicator of a product's actual performance.	DOE understands that there are numerous metrics currently in use which can be used to calculate the energy efficiency of a LNE product. Most of these metrics rely on similar power and throughput measurements, but just arrange the measurements differently in the equation to arrive at a final efficiency value. At this stage in the ENERGY STAR LNE development process, DOE and EPA are more interested in the actual measurements than an “overall metric value”. Therefore, DOE has not included an efficiency metric in the Draft 1 Test Method.
26	Standards - ECR	One stakeholder requested that ECR no longer be referenced, and to only reference the ATIS procedure	DOE appreciates the comment and has removed references to the ECR Initiative standard in the Draft 1 Test Method. The Draft 1 Test Method references the most recent ATIS standard, ATIS-0600015.03.2013.
27	Metrics - Reporting (PPDS)	One stakeholder stressed the importance of all performance data being provided in the PPDS for end-users, and stated this will be one of the key benefits of the program	EPA intends to develop a PPDS which will provide additional product information beyond what is displayed on the qualified product list. Stakeholders will have an opportunity to review the contents of the PPDS prior to its release during the development of the V1.0 specification.
28	Test Method - TEER	Stakeholders requested that only the most recent version of ATIS be referenced in the test method.	The Draft 1 Test Method references the most recent ATIS standard, ATIS-0600015.03.2013.
29	Test Method - Cost	Some stakeholders were concerned about the costs associated in performing energy efficiency testing that does not align perfectly with the current ATIS standard, which they already conduct.	DOE is aware that performing this type of testing can be expensive, and has therefore carefully considered the potential test burden associated with the Draft 1 Test Method. Furthermore, DOE hopes to work with stakeholders in order to reduce the burden associated with testing during the development of the test method.
30	Test Method - Power Savings Features	Stakeholders requested that products be tested as shipped rather than having power saving features turned off. They state that having the power saving features turned off may lead to their inability to meet qualification criteria for V1.	DOE has updated the Draft 1 Test Method to test each UUT as shipped. Based on this, any power saving feature which is enabled by default will be permitted to remain enabled during testing.
31	Test Method - Latency	One stakeholder asked how to account for latency when re-powering ports that are turned off due to lack of traffic.	See Index #5. The Draft 1 Test Method no longer includes an idle test, so all of the Variable Load tests will provide traffic to the UUT ports. For this reason. DOE does not believe that a connected port on the UUT will experience the “lack of traffic” condition described in the comment during testing.
32	Test Method - Scaling and Redundancy	One stakeholder stated that the test method must address scalability in systems, and also redundancy in chassis (e.g. resilient servers in the computer server program)	DOE understands that a product’s power consumption may be affected by its amount of internal storage, computing resources, and/or redundancy. However, the Draft 1 Test Method does not address system scalability. This is an issue that will be discussed in the context of product families and/or product categories during the development of the LNE Specification.
33	Test Method - Packet Size	One stakeholder stated that because switches are Ethernet based, the minimum packet size should be 64 bytes (lines 137-138, 157-173). Anything smaller is likely to be dropped by the test.	DOE is continuing to reference the ATIS standard for packet sizes and distributions in the Draft 1 Test Method. Any payloads smaller than the minimum allowed by the Ethernet standard can be padded in order to meet the minimum size required for transmission. DOE does not believe that there will be any issues caused by the packet sizes used in the Draft 1 Test Method.

34	Test Method - Port Speed	One stakeholder stated that testing protocols need to include 10GbE and 40GbE ports. These port speeds are prevalent in aggregation and core switches in both enterprise and data center settings. As server connectivity moves from 1GbE to 10GbE to 40GbE in the next couple of years, it is important to include these speeds.	Section 5.2 of the ATIS standard requires that tested using the Ethernet standard (IEEE 802.3). The Draft 1 requires that testing be carried out in manner which is consistent with the ATIS standards. Therefore, any port speed may be tested (e.g., 10GbE, 40GbE, 100GbE) if it is compliant with the Ethernet standard.