REF NO.	Topic	Stakeholder Comment	EPA Response
46	Applicability	A stakeholder suggested that for "thin" WLAN Access Points that require a controller to operate, the test procedure should specify that the supplier must provide a "typical" controller.	EPA has clarified this point on line 275 to address such product appropriately.
38	Definitions	A stakeholder requested that a definition for IHAD be added to the document.	A temporary definition for Integrated Access Device (IAD), the terminology EPA intends to use moving forward for IHAD, has been included on line 52. It will be further refined as part of the draft process.
90	General	A stakeholder suggested consideration for an adder for SNE that implements LLDP for EEE, as the feature allows for enhanced savings in the system. Another stakeholder noted that if LLDP is supported in the client UUT, it should be supported in the test host.	EPA has added a requirement to report if LLDP for 802.3az has been enabled during the test.
91	General	A stakeholder expressed that there is a distinct difference between enterprise grade small network equipment and Industrial Ethernet small networking equipment, and suggested separate categorization based on this distinction. The stakeholder suggested defining an industrial rating should through IEC 61850 / IEC61000, IEEE1613, and KEMA.	EPA intends to investigate the proposed distinctions further as data is available to assess and characterize.
96	General	A stakeholder suggested a notation for products that are manufactured to RoHS compliance, as opposed to products manufactured with hazardous amounts of lead and arsenic and other chemicals.	EPA will take this suggestion under consideration. While ENERGY STAR is focused on energy efficiency, EPA is continuing to investigate how other environmental attributes may be supported through the program's efforts.
99	General	A stakeholder noted efforts completed by the Home Gateway Initiative as a possible area of alignment for the ENERGY STAR program. Test methods, definitions, power targets, and implementation methods were cited.	EPA is currently reviewing documents from HGI to assess where alignment might be possible and warranted. EPA has decided to proceed, however, with the development of a specialized test procedure as a an existing, suitable procedure was not found.
30	Reporting	Stakeholders suggested that as part of the required information, detailed type and number of all WAN and LAN Interfaces should be specified, along with any built in features for voice processing or storage capability.	EPA has developed the data collection form accordingly.
19	Test Procedure	A stakeholder noted that logarithmically increasing loads do not reflect the typical usage scenarios for a small network and that the use of random TCP traffic may place an unrealistic burden on certain devices. Another stakeholder suggested that the use of randomized port numbers may cause difficulties for any NAT/PAT or firewall device and could cause some devices to crash. A preference was expressed for use of a limited number of "well known" port numbers and not to vary ports on a packet-by-packet basis.	EPA has used a series of increasing traffic loads to provide scaled data for analysis and not to mimic actual network activity. In addition, EPA clarifies that "random ports" refer to a random port being selected during the test setup, not that traffic be the port numbers of the traffic are not randomly-delivered from packet to packet.
20	Test Procedure	A stakeholder expressed concern that the loading conditions in the test procedure suggested that the UUT would be subject to a period of over-subscription.	EPA's intent was not to drive this behavior and the test procedure has been revised accordingly.
21	Test Procedure	A stakeholder expressed a preference for testing using a real TCP data transfer or testing the device at its highest non-drop rate. This was cited as the "100%" test in the ATIS TEER standard.	EPA has taken this suggestion under consideration.
22	Test Procedure	A stakeholder stated that it is unlikely that the power consumed by SNE will vary significantly with one order of magnitude difference in steady offered load. They suggested an alternative usage scenario with periods of heavy utilization interspersed with long periods of very low traffic.	EPA believes that acquisition of data at different load levels is crucial to fully investigating this point of view and proposes further discussing this suggestion once data collection is complete.
23	Test Procedure	A stakeholder suggested integrated energy measurement over a predetermined time period rather than instantaneous measurements. A specific suggestion of loading the UUT with artificial "keep-alive" traffic equivalent to 1Kb/s periodically interspersed with a 10Mbyte FTP file transfer.	EPA's testing does not show that this method produces different results than the method used in the test procedure.
24	Test Procedure	Stakeholders expressed confusion over the test conditions in the Wired Network - LAN test (minimum/half/full ports). A stakeholder also expressed the opinion that testing beyond the condition with all ports connected was unnecessary.	EPA has added Table 6 to this section to clarify how each test should be caried out for devices with different port counts. EPA believes that because many SNE devices operate with partial utilization of physical ports, there is a need to evaluate this condition as part of the data collection effort. EPA also believes that if there is a savings opportunity available for better handling of the partial-port condition, any test procedure EPA implements should provide an opportunity for those manufacturers who see fit to take advantage of this opportunity.
25	Test Procedure	A stakeholder expressed a preference for a single port to be selected as the primary source/sink port (with a designated uplink or WAN port the default). The traffic would be configured on all ports to pass to or from this primary source/sink port, at a predetermined data rate, with even and randomized traffic between the other ports.	EPA has updated the test procedure accordingly.
26	Test Procedure	A stakeholder noted that the first revision did not address wireless access points with multiple radios or wireless access points that can support multiple bands simultaneously.	EPA addressed this discrepancy and added provisions accordingly
28	Test Procedure	A stakeholder suggested that devices with different WAN connection (ADSL, VDSL, Cable and others) should have their own product types.	EPA will evaluate this comment once data is available from the revision 2 data collection process. At that time, it will be possible to see where categorizations are needed.
29	Test Procedure	A stakeholder suggested that IAD definitions include Voice (VoIP) functionality by default or to evaluate IADs with voice capability separately from those lacking the feature.	In the data collection form, EPA is requesting that products with VOIP functions be identified as such. This will allow data to be reviewed in context and this point to be evaluated appropriately.
36	Test Procedure	To represent real life traffic, a stakeholder suggested running lower speed tests packets (voice traffic) and higher speed tests with bigger packets (e.g., 1600 bytes) simulating video or large file download.	While EPA doesn't expect that changing packet size would change energy use appreciably, stakeholders are encouraged to submit data which informs this point to EPA for review.
37	Test Procedure	A stakeholder noted that most DSL and optical point to multipoint systems (PON) provide asymmetrical bit rates, with maximum asymmetry for ADSL (>20 down / 1 up).	EPA has modified section 6.1 to incorporate provisions for devices supporting only asymmetric traffic.
44	Test Procedure	A stakeholder requested clarification of the language "Measure the power of the device in the initial configuration as per 6.2 above." in section 6.3.A.	EPA revised 6.3.A and Section 5 to clearly describe the conditions for the Idle power test.
64	Test Procedure	A stakeholder requested that the test procedure define how power measurements will be determined for the full range of devices in scope including optional interfaces.	EPA understands that the range of products being considered may vary greatly. To set the stage for the future step of developing a criteria structure in the specification, EPA is collecting meta data about product features and configurations along with measurement data. As standard with all ENERGY STAR IT specification development processes, this information is used to contextualize data to ensure improper comparisons are not made. This activity will be part of the specification development phase, beginning toward the end of the data collection period.
65	Test Procedure	A stakeholder noted that some interfaces that are not connected will still consume power due to polling for a connection.	EPA welcomes examples of the impact of such features and future opportunities to reduce this standby power consumption. EPA will collect information on all interfaces in devices as a way to characterize and better analyze data received as part of the data collection effort.
66	Test Procedure	The modems and ONT section assumes the device has an Ethernet port to test the WAN interface. It also does not specify that the test is to be run in 100BaseT first, if available, before testing with GigE.	All tests are intended to be run at the maximum link speeds of the device. EPA has clarified this within the second revision of the test procedure.
83	Test Procedure	A stakeholder requested clarification on the nature of the test procedure, its place in the program, and how data would be used.	EPA included a note on the first page of the revised test procedure and in the email accompanying the document to clarify these details.
85	Test Procedure	"Ensure only one LAN port is connected" -does that refer to the Wi-Fi connection or a wired connection?	The language in the procedure has been revised for clarity.

86	Test Procedure	Many APs prefer to not use the highest rate in order to increase range and stability.	Sufficient signal strength is provided to ensure lower rates are not required.
1	Test Setup	A stakeholder suggested adding an elevation requirement to the procedure, specifying sea-level conditions.	EPA believes that elevation is not a determining factor in energy use for SNE. The atmospheric pressure requirement has been added to Table 1 to set an upper bound.
2	Test Setup	The use of TCP only may be acceptable for most equipment, as it is typical of many usage scenarios. It should be noted that it does not reflect the behavior of many newer audio/video applications.	The procedure now calls for the use of UDP. Although this may be less typical than TCP, EPA does not believe this will change power measurements significantly.
3	Test Setup	The use of symmetric data transfers is not typical for this class of device and is inconsistent with typical TCP usage. It would be preferable to intersperse "get" and "put" style operations in a typical ratio with traffic patterns that mimic real usage.	EPA has decided to maintain the use of symmetric data to simplify the procedure and EPA believes energy measurements will be representative using this method.
4	Test Setup	The use of IMIX traffic patterns is inconsistent with the use of TCP, as this will produce anomalous traffic. For edge devices, especially for home networking with audio/video usage, there will be a much higher ratio of maximum length packets. Using real TCP interactions will correct this. Alternatively, there needs to be some thought regarding typical traffic mix for these small networks.	The procedure was revised to call for the use of UDP, resolving this issue.
32	Test Setup	A stakeholder noted that the 2% accuracy requirement in secion 4.3 could be critical to valid results when measuring low AC loads. They further commented that if the device was powered by a switching power supply with a low power factor, achieving this level of accuracy would be difficult and that EPA should evaluate the feasibility of this accuracy requirement.	As noted in the note preceeding section 4.3, EPA is aware of ongoing efforts to revise the underlying standard governing this accuracy level. Independent of possible changes due to this update, EPA agrees that the accuracy of measurement at low load levels is critical to the validity of results. Furthermore, EPA has included the specified accuracy in numerous ENERGY STAR test procedures and is aware of power analyzer equipment meeting this and the other instrumentation requirements.
39	Test Setup	A stakeholder suggested that A2LA accreditation be added to the secion 4.1 Quality Control section in the event a manufacture chooses to use a third party lab.	While this suggestion does not apply to initial data collection, efforts are ongoing at the ENERGY STAR program level to develop and align accreditation requirements. As such, this and similar proposals will be evaluated in that process.
40	Test Setup	A stakeholder requested an example of the significant digit requirement in paragraph 4.2.	The language is standard for ENERGY STAR specifications and balances program needs and measurement equipment capability. A reference may be found at *http://en.wikipedia.org/wiki/Significant_figures*
41	Test Setup	A stakeholder requested clarification that all test equipment used for power measurement must be calibrated, suggesting NIST tractability as an option.	Calibration standards are recommended in the second revision per the standard language used in ENERGY STAR test procedures.
93	Test Setup	A stakeholder suggested categorizing DC perating voltages (e.g., 48v, 24v / 12v).	EPA is only aware of SNE powerable by PoE (48V), but does not intend to exclude other standard low-voltage DC supply technologies.
94	Test Setup	A stakeholder suggested testing idle power consumption over a 60 minute period needs to be measured to account for always-on devices.	Since the Idle test is carried out without traffic being passed to the device, EPA does not believe operating conditions will vary significantly during a much shorter test period and has proposed a shorter test to limit test burden.
6	UUT Configuration	Stakeholders noted devices offer dual power supply options (typically external power supply or standard DC power – USB or PoE). It was suggested that for such devices, it should be acceptable to choose the option that is more efficient.	EPA will consider this comment further, but initially believes that AC powering for such devices is likely the most expected scenario for small network equipment. Section 5.1 specifies the appropriate priscidence for selecting a power source in devices supporting multiple power supply options.
7	UUT Configuration	A stakeholder noted that 2m cable length is not typical of actual applications and that a 10m cable would be more realistic. 2m cables were also noted as significantly shorter than the average for enterprise devices.	EPA received mixed feedback on the length of cable for testing. It was thought that limiting the cable length would make testing more straightforawrd and limit unintended impacts on testing results. EPA will consider increasing the cable length in a future revision.
8	UUT Configuration	A stakeholder noted that Energy Efficient Ethernet (IEEE 802.3az) compliant equipment should not be expected until 2011 (at the earliest).	EPA intends to continue to closely monitor the IEEE 802.3az development effort.
9	UUT Configuration	A stakeholder questioned the use of a cable-based test for wireless devices. The stakeholder noted that the test will hide the power consumed by interference mitigation functions and possibly obscure the effects of other features that either save energy or consume increased power in real wireless situations (e.g., optimization for mobile clients, efficient power backoff).	In discussions and internal testing, EPA has determined that cable-based testing is the best option for devices with removable antennas. The second revision, however, now includes a test configuration for devices with static antennas. See lines 249-274.
11	UUT Configuration	A stakeholder expressed a preference for multiple clients with changing associations defined during the test. The stakeholder believed that single client setups were atypical and postulated possible power impacts associated with managing multiple clients. The stakeholder suggested that the number of clients should be based on the class of device and suggested further research into the topic.	In EPA's initial testing, increasing the number of clients did not significantly impact the amount of energy consumed. In addition, the complexity of the test setup must be balanced with the level of required testing burden to ensure repeatability and allow manufactuerers to participate in data collection and future qualification activities.
12	UUT Configuration	A stakeholder asked if static routing is expected during the test.	In section 5.6, EPA clarified that a static address may be provided if random assignment is not supported.
13	UUT Configuration	A stakeholder asked if the UUT should run DHCP autonomously on the client side or run DHCP-relay and if the UUT should also act as a DHCP client on the WAN side in situations where the client-side DHCP is autonomous.	The device should operate as it ships by default to the customer. If it is configured to be a DHCP client and run NAT, then it should operate as such. If it is doing DHCP pass through, then it should operate as such.
14	UUT Configuration	A stakeholder noted the lack of mention of DNS and requested clarification if the UUT should act as a DNS proxy or advertise DNS hosts from its own DHCP to its DHCP clients.	EPA intends for the unit to remain configured as shipped when it is tested, regardless if the test relies on host names. EPA believes that IPv6, mDNS, LLMNR and other features will still ultimately be exposed.
15	UUT Configuration	A stakeholder noted classes of devices where the security and encryption functions constitute the largest proportion of device functionality and suggested that disabling security features would not result in valid test results. The stakeholder also noted no mention of other encryption or tunneling functions apart from IPsec.	While devices that have secondary security functions are within scope, devices that are primarily security appliances are not within the current scope of the SNE program. Therefore, EPA has not designed the energy test to explicitly address these functions. EPA asks that stakeholders do report related security features enabled during a set of test results in the data collection form to allow for potential consideration in the specification development.
16	UUT Configuration	Modem (section a,i): The medium that is used to connect the WAN port may have a strong effect on the power usage – particularly for modern DSL and cable modem devices. Similarly, some features may save significant energy in scenarios where the link is configured for a slower rate than the maximum. Either this section or the test procedure needs to cover both of these scenarios.	The test procedure was updated to provide clarity on this topic.
17	UUT Configuration	Access Point (section c, i): It is unclear what is meant by "WAN source" in this context. The definition of "Access Point" should categorize it as a LAN device, as distinct from an IHAD that would naturally have a WAN connection.	The test procedure was updated to clarify the role of the test client serving the wireless UUT. Test setup has also been revised to clarify differences between access points and IADs (IHADs).
33	UUT Configuration	A stakeholder requested clarification on broadcasting frequencies for the different wireless protocols.	EPA revised and clarified in the wireless link precedence section, starting on line 171.
35	UUT Configuration	It is not clear how to measure. Multiple antenna systems could be both dual frequency systems (2.4/5GHz) and MIMO equipment. In the first case, each antenna port could be connected to its respective client. MIMO equipment need different test set-up.	The procedure has been clarified explaining how to handle MIMO equipment.
45	UUT Configuration	A stakeholder expressed support for simplified testing of DC-powered devices and requested clarification of the DC testing protocol.	EPA has detailed connection of the power source and power analyzer in section 5.5.3.
47	UUT Configuration	A stakeholder asked how devices that support multiple power sources (AC, DC, POE) should be powered in the test.	The precedence for power source selection in devices supporting multiple forms of power supply has been added to the procedure.

50	UUT Configuration	A stakeholder noted that some devices support automatica adjustment of radio power levels to reduce power consumption.	EPA believes that any such technology is important and should be employed, provided the technique/technology employed does not break established standards or require a very specific set of conditions to operate. EPA would like to evaluate available technologies further and encourages stakeholders to provide data and/or further input on this topic.
71	UUT Configuration	A stakeholder noted that different power supplies will present different efficiencies at load.	When a standard low-voltage DC supply is required, the procedure specifies that it be from the UUT manufacturer, if such a supply is available. If the unit is powered by an EPS, the test should be conducted using the EPS shipped with the UUT.
73	UUT Configuration	A stakeholder pointed out that several non-Ethernet networking technologies were not formally considered in the first revision (e.g., MoCA, powerline) while other interfaces not specifically dedicated to networking were (e.g., USB, analog connections, POTS, audio).	EPA worked to clarify the status of various network technologies and interfaces for testing. Section 5.2.1 (line 141) clarifies the status of non-Ethernet wired ports during the test. In addition, Table 3 (line 217) now lists both connection interfaces in order of testing precedence and provides default testing conditions for each.
74	UUT Configuration	A stakeholder commented that there are devices other than Ethernet that use networking technologies for WAN which EPA could consider in the program.	Table 3 (line 217) now lists both connection interfaces in order of testing precedence and provides default testing conditions for each.
75	UUT Configuration	A stakeholder commented that non-Ethernet wired LAN/WAN technologies require significantly different testing methodologies as they are shared medium and not switched point-to-point like Ethernet.	Table 3 includes details on testing media type and technology-specific upload and download speeds.
76	UUT Configuration	A stakeholder asked if 802.11n connections would require imply simultaneous dual band APs or dual band single radio APs.	In 5.3.6, EPA has clarified the precedence of various wireless connection protocols, which covers this specific point.
77	UUT Configuration	A stakeholder noted that the default setting for most APs is to be rate adaptive and requested clarification of the wireless network conditions. The stakeholder further noted that voice and video APs are often configured to not be rate adaptive in order to increase range and stabilize rate.	The procedure clarifies that the default data rate setting should be used. EPA expects that the default data rate may be an adaptive rate in many cases.
78	UUT Configuration	A stakeholder commented that many APs and clients do not have accessible or non-integrated antennas and that cabled testing would not be possible for such products.	In section 5.5.2.c, provision iv has been added to provide wireless testing conditions for APs without removeable antennas.
79	UUT Configuration	The number of antennas on APs and STA are often not equal.	The procedure has been clarified explaining how to handle equipment capable of operation with multiple antenna configurations.
80	UUT Configuration	A stakeholder commented that cabling disrupts the 802.11n's MIMO technology.	EPA's evaluations and internal testing have shown that wireless LAN testers are available that support 802.11n over cabled tests.
81	UUT Configuration	A stakeholder suggested adding test setup diagrams to the test procedure to clarify how connections should be made.	EPA has added a number of diagrams to the second revision accordingly.
82	UUT Configuration	A stakeholder noted that link rates are dependent on many factors and that the "maximum supported" rate is "often not achievable."	Table 3 is intended to provide technology-appropriate link speeds for the WAN connection.
87	UUT Configuration	A stakeholder suggested that PoE power sources are not applicable to SNE at this time.	With this test procedure, EPA intends to be as broad as possible to capture a wide range of the products under consideration. Placing provisions in the specification now for PoE avoids the unintended consequence of limiting products from seeking qualification that would otherwise fit the program.
97	UUT Configuration	A stakeholder provided a number of comments on PoE testing and potential complexities with power losses in the cabling into the device used for power. The stakeholder provided the following suggestions: 1. To test the UUT at the UUT input to simplify the test procedure and partially canceling the affecting test elements such PSE and Cable. 2. The Cable length between the PSE or the DC power source to the UUT will be <1m long in order to cancel the cable loss effect on PD efficiency and PSE efficiency.	The procedure specifies fixed cable lengths and cable types, which will ensure that consistent power is lost in the cable. The test calls for a PoE injector to be used if no AC adapter is included with the device. In this case, the consumption of a PoE providing switch is not of concern.
98	UUT Configuration	The note at the end of 5.1: This note is not clear. In 5.1 the intent is to measure the UUT input power. In 5.1 part 1- It is measured at the AC mains. 5.1 part 2: Question 1: What is the intent of "measure the dc power directly" ? I thought that we care only the DC input power of the UUT?. (e.g. in case of AP powered by PoE power source only the UUT is relevant? Or we want to test the whole system from UUT input to the mains?) Question 2: If the intent is to measure the power from the UUT input to the mains in case of PoE power source, there is no typical "factor" of conversion as in just AC/DC converter. It is more complex issue of the cable length effect, the PoE management system that makes it compliant PoE, the number of ports and more. Recommendations: All over the spec, when PoE power source is used to power the UUT, the UUT input power shall be tested only and the PoE power source shall be used just as its power source and not part of the UUT.	Section 5.1 was revised in the second revision to clarify measurement using a low-voltage DC power source such as PoE.