



ENERGY STAR®

Version 2.0 Small Network Equipment Discussion Guide Webinar

U.S. Environmental Protection Agency
U.S. Department of Energy
January 7, 2021





Agenda

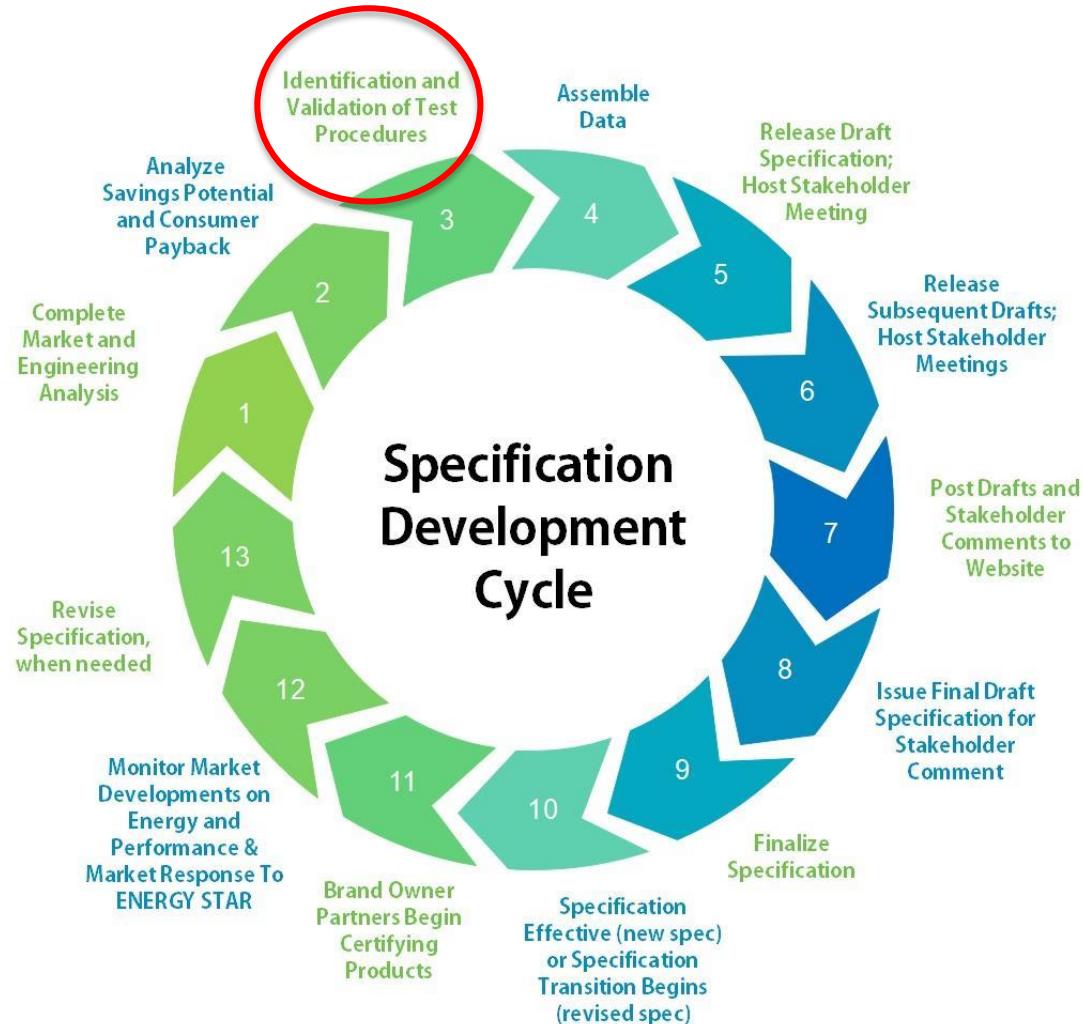
- Introduction/Overview
- Specification Topics
- Test Method Topics
- Timeline and Next Steps



Introductions

- EPA
 - Ryan Fogle
 - John Clinger (ICF)
- DOE
 - Jeremy Dommu
 - Mansi Thakkar (Guidehouse)
 - Harry Wang (Guidehouse)

Review of Specification Development Cycle





Specification Topics

- ENERGY STAR is considering where and how to align Version 2.0 of the SNE specification with EU CoC¹ in the following areas:
 - Scope
 - Base power allowances and functional adders

¹ Bertoldi, P., Code of Conduct on Energy Consumption of Broadband Equipment, Version 7.0, European Commission, Ispra, 2019. Available at: <https://e3p.jrc.ec.europa.eu/communities/ict-code-conduct-energy-consumption-broadband-communication-equipment>.



Scope

- The EU CoC covers several product areas which are not in scope of the Version 1.0 SNE specification including:
 - Cable and ONT service provider equipment (CCAP, CMTS, Edge-QAM)
 - G.fast DSL
 - MSAN where POTS interface is combined with DSL broadband interface
 - VoIP gateways and VoIP telephones
 - Powerline adapters
 - HPNA, MoCA and optical LAN adapters
 - GSM/EDGE, WCDMA/HSDPA and LTE focused cellular network equipment
- EPA is not considering including VoIP telephones in this effort as they are already covered in the ENERGY STAR telephony specification.



Discussion

- Should any of the products above be added to ENERGY STAR scope? If so, do stakeholders have supporting product data to support level setting in a Draft 1 specification?
 - Ideally this data would be collected using the EU CoC test method.
- Are DSL modems and DSL based IAD products still sufficiently relevant in the US market that they should be continued to be include in scope for the ENERGY STAR Version 2.0 SNE specification?



Base Power Allowances and Functional Adders

- The current ENERGY STAR Version 1.0 SNE specification contains a combined 15 base allowances and functional adders
- Latest version of EU CoC contains nearly 250 combined base allowances and functional adders
 - Many adders included in the EU CoC are not relevant to product types covered in the ENERGY STAR Version 1.0 SNE scope
 - Other EU CoC adders are heavily focused on DSL technologies which appear to be less common in the U.S. market



Discussion

- EPA aims to reduce the number of adders used in the EU CoC without negatively impacting product functionality. With that goal in mind:
 - Are there obvious sections of adders that can/should be simplified as compared to what is presented in the EU CoC? Examples may include:
 - Consolidating ONT adders
 - Reducing variation/duplicity of Wi-Fi radio configuration adders
 - Are there obvious adders that are not relevant for the U.S. market that could be removed?



Test Method Topics

- ENERGY STAR seeks stakeholder feedbacks for the Version 2.0 SNE Test Method in the following areas:
 - On Mode Tests
 - Half Ports Test
 - Wireless Test and Wireless Protocols
 - Traffic Generator Profile



On Mode Tests

- ENERGY STAR Version 1.0 has an On Mode test with three subparts:
 - Idle State test
 - Low Data Rate test
 - High Data Rate test
- EU CoC has two tests:
 - Idle State test (similar to ENERGY STAR's Idle State test but allows insignificant handshake traffic)
 - On State test (equivalent to ENERGY STAR's High Data Rate test)



On Mode Tests

- ENERGY STAR Version 1.0 High Data Rate test:
 - Utilizes the equation and table below to determine the maximum data rate achievable:

Direction	Rate (Mb/s)								
Downlink or Symmetric Link	1.0	2.0	5.0	10	20	50	100	200	500
Uplink	0.5	1.0	2.0	5.0	10	20	50	100	200

$Data\ Rate = Z * 10^Y$ (in bits per second)

Where: Z is 1, 2, or 5; and Y is an integer. Adjust as required to achieve the desired data rate.

- EU CoC On State test:
 - Equivalent to ENERGY STAR Version 1.0’s high data rate test but with traffic rate based on the per port specification, and not necessarily the highest supported data rate of each port.



On Mode Tests

- ENERGY STAR is proposing to align its High Data Rate test with that of EU CoC's On State test.
- Idle State and Low Data Rate test will remain unchanged in Version 2.0.



Discussion

- Are the individually defined per port data rates from the EU CoC sufficient to mimic high data rate usage scenarios?
- Should ENERGY STAR also incorporate EU CoC's unit link rate, channel and WAN profile selections?
- Do stakeholders agree with the approach to retain both the low data rate and idle state tests?



Half Ports Test

- ENERGY STAR Version 1.0 Half Ports test:
 - Requires half of the available LAN Ethernet ports to be connected and the energy consumption of these ports captured by mimicking real-life workloads for local network ports.
- EU CoC Per Port Requirement:
 - EU CoC's device setup includes a per port data rate specification for LAN Ethernet ports as part of the On State test.
 - This obviates the need for a separate half ports test.
- ENERGY STAR proposes to remove the Half Ports Test for Version 2.0.



Discussion

- Would a separate half ports test be required if the ENERGY STAR Version 2.0 test method incorporates the EU CoC's On State Test instead? If so, what are the needs?



Wireless Test – ENERGY STAR Version 1.0

- Specifies a separate test for wireless products.
- Requires UUT to be placed in a shielded box with transmitting signals attenuated.
- Requires Idle State, High Data Rate, and Low Data Rate tests to be repeated with a wireless connection only.
- Does not have some of the latest wireless network protocols, namely the Wi-Fi 6 protocol (IEEE 802.11ax).



Wireless Test – EU CoC

- EU CoC's Wireless test is part of its On State test with a simpler setup when compared to that of ENERGY STAR.
 - EU CoC requires one client per Wi-Fi band, 1-5 meters from the access point with no same band interference. There is no shielded box or attenuation requirements.
 - EU CoC also accounts for IEEE 802.11ax in the per port setup specification.
- ENERGY STAR proposes to align the wireless test requirements with those in the EU CoC for Version 2.0.



Discussion

- Are there scenarios that stakeholders can foresee that would cause interference with test results, if the ENERGY STAR Version 2.0 test method aligns with the EU CoC?
- ENERGY STAR also proposes to include the updated IEEE 802.11ax protocol in the wireless link precedence. Are there other wireless protocols that should be considered for inclusion?
- ENERGY STAR requests feedback on these proposals and whether there are other specifications pertinent to the wireless test that should be adopted.



Traffic Generator Profile

- ENERGY STAR Version 1.0 traffic generator profile:
 - ENERGY STAR Version 1.0 test method requires the use of a data generator to transmit a specific data traffic profile called Internet Traffic Mix (IMIX) by mixing three different data packets as shown below:

Datagram Size (IP Length in Bytes)	Frame Length (Bytes)	% of total packets
40	64	61%
576	594	23%
1500	1518	16%

- EU CoC's traffic profile only has data rate requirements but no frame size requirements other than for Fast Ethernet WAN and Gigabit Ethernet WAN ports.
- ENERGY STAR proposes to retain the traffic generator profile for Version 2.0.



Discussion

- Do stakeholders agree with the approach to keep the Version 1.0 traffic generator profile? If not, are there other traffic profiles that can mimic the real-life network traffic pattern and packet distributions?



Additional Discussion Topics

- Are there any additional requirements in the EU CoC that should be considered for inclusion in the ENERGY STAR Version 2.0 SNE test method?
- In addition to the topics discussed here, are there any other alternative requirements that stakeholders recommend be considered when developing the ENERGY STAR Version 2.0 SNE test method?



Timeline and Next Steps

- Today: Discussion guide webinar
- January 22: Deadline for written feedback
- March 2021: Draft 1
- June 2021: Draft 2
- August 2021: Final Draft



Any Final Questions?



Discussion Guide Comment Deadline

- Send written feedback to networking@energystar.gov

Comment Deadline

Friday, January 22, 2021



Thank You!

- Questions on specification development:

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