ENERGY STAR® Telephony Webinar

July 9, 2013

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ENERGY STAR Program

Webinar Details

- Webinar slides and related materials will be available on the Telephony Web page:
  - www.energystar.gov/revisedspecs
  - *Follow link to "Version 3.0 is in Development" under "Telephony"*

- Audio provided via teleconference:

  Call in: +1 (877) 423-6338 (U.S.)
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  Code: 198-920 #

  - Phone lines will remain open during discussion
  - Please mute line unless speaking
  - Press *6 to mute and *6 to un-mute your line

Introductions

- **Paul Karaffa**
  U.S. Environmental Protection Agency
- **Bryan Berringer**
  U.S. Department of Energy
- **Matt Malinowski**
  ICF International
- **Kurt Klinke**
  Navigant Consulting
- **Tom Bolioli**
  Terra Novum

Activities to Date

- Late 2011: Specification Revision Launch
- June 2012: Release of Draft 1 Test Method
- December 2012: Draft 2 Test Method
- Early 2013: Data Assembly

- **June 19, 2013: Release of Draft 1 Specification and Draft 3 Test Method**
- **Today, July 9, 2013: Overview of Draft 1 Specification and Draft 3 Test Method**

Written Comments

In addition to making verbal comments during today's call, stakeholders are encouraged to submit written comments to telephony@energystar.gov.

Comment Deadline
Friday, July 19, 2013

Webinar Objectives

- Review changes from Draft 2 to Draft 3 Test Method
- Review Draft 1 Specification
- Receive feedback from stakeholders

Draft 3 Test Method Update

1. Draft 3 Test Method Update
2. Draft 1 Specification Update
3. Next Steps

Review of Draft 3 Test Method

- Draft 3 contains **four** major revisions, based on data collection and stakeholder feedback:
  1. Additional Handsets (AH)
  2. Data Switch Port
  3. Hybrid Telephones
  4. Modes for Testing

Revision #1 – Additional Handsets

Draft 2 Proposal

Base Stations shipped with AHs shall be tested both **with** and **without** the AHs set up

Note:

- Data collected as part of data call to determine effect of AHs Base Station power consumption

Revision #1 – Additional Handsets

Draft 3 Proposal

Base Stations shipped with AHs shall be tested **with** the AHs set up

Rationale:

- AHs increase base station power consumption by up to 3%
- Connecting AHs is representative of normal operation

Revision #2 – Data Switch Port

Draft 2 Proposal

Telephones with a Data Switch Port shall be tested both **with** and **without** the port connected in Partial On Mode

Note:

- Data collected as part of data call to determine effect of Data Switch Ports on power consumption

Revision #2 – Data Switch Port

Draft 3 Proposal

Telephones with a Data Switch Port shall be tested **with** the port connected in Partial On Mode

Rationale:

- Data analysis showed connecting the Data Switch Port can increase power consumption up to 22%

Revision #3 – Hybrid Telephones

Draft 2 Proposal

Test setup for Hybrid Telephones:

- If unit is shipped with external power supply (EPS), test as ac powered unit
- Otherwise, test using Power over Ethernet (PoE)

Revision #3 – Hybrid Telephones

Draft 3 Proposal

Test setup for Hybrid Telephones:

- If a unit can be powered by PoE, test using PoE
- Otherwise, test as an ac powered unit

Rationale:

- Ensures all PoE powered units are tested in the same manner
- Measures only actual Telephone power

Revision #4 – Modes for Testing

Draft 2 Proposal

Units shall be tested in the following modes based on product configuration:

Product Configuration	Partial On Mode	Active Mode
Corded Telephone	X	X
Cordless Telephone	X	X
Conference Telephone	X	X
Additional Handset	X	
WiFi Telephone	X	

Revision #4 – Modes for Testing

Comment Received:

- Some products have additional low power states that should be measured during testing

- Data received from data call showed that power consumption did not change between the Partial On and Active Mode Tests

Revision #4 – Modes for Testing

Draft 3 Proposal

Units shall be tested in the following modes based on product configuration:

Product Configuration	Partial On Mode	Off Mode*	*Active Mode*
Corded Telephone	X	* Off Mode shall be tested when available.	***No longer tested***
Cordless Telephone	X		
Conference Telephone	X		
Additional Handset	X		
WiFi Telephone	X		

Revision #4 – Modes for Testing

Off Mode Test:

- Place the unit in Off Mode, per the manufacturer instructions
- Allow unit to stabilize in Off Mode for 10 minutes
- Measure and record power consumption for 10 minutes

Rationale:

- Active Mode testing unnecessary – data showed no significant difference in Active and Partial On Mode power consumption
- Testing Off Mode ensures additional power saving features are measured during testing

Summary of Proposed Changes

Topic	Draft 2 Test Method	Draft 3 Test Method
Additional Handsets	• Test **with** AHs set up • Test **without** AHs set up	• Test **with** AHs set up
Data Switch Port	• Test **with** Switch Port connected • Test **without** Switch Port connected	• Test **with** Switch Port connected
Hybrid Telephones	• Test with EPS, if shipped with on • Otherwise, test with PoE	• Test with PoE, if available • Otherwise, test as ac powered unit
Modes for Testing	Modes tested: • Partial On Mode • Active Mode	Modes tested: • Partial On Mode • Off Mode

Additional Comments

Additional Comments?

Written Comments are due by July 19

Draft 1 Specification Update

1. Draft 3 Test Method Update
2. Draft 1 Specification Update
3. Next Steps

Currently Covered Products Recap

- Current covered products under Version 2.0 include:
  - Cordless phones,
  - Answering machines,
  - Additional handsets, and
  - Combination units

- High market penetration of existing ENERGY STAR qualified telephony products
  - 60% for cordless phones
  - 80% for combination units

Removal from Scope

- EPA has removed standalone **Answering Machines** from the scope of the ENERGY STAR Version 3.0 specification
  - Only 1 model certified to Version 2.2

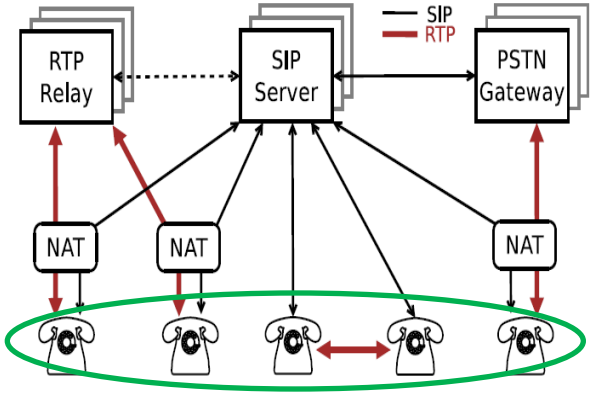
Additions to the Scope

Corded Phones

- Same features as cordless:
  - EPS
  - Answering Device
  - Radio Transceiver

Voice-over-Internet-Protocol Phones

- Phone that implements VoIP
- Sound converted into IP data packets for network transmission
- Back-end system (servers, switches) excluded from scope



Client-server ITSP architecture
Source: Baset and Schulzrinne. *Energy Efficiency of Voice-over-IP Systems*. Columbia University 2010

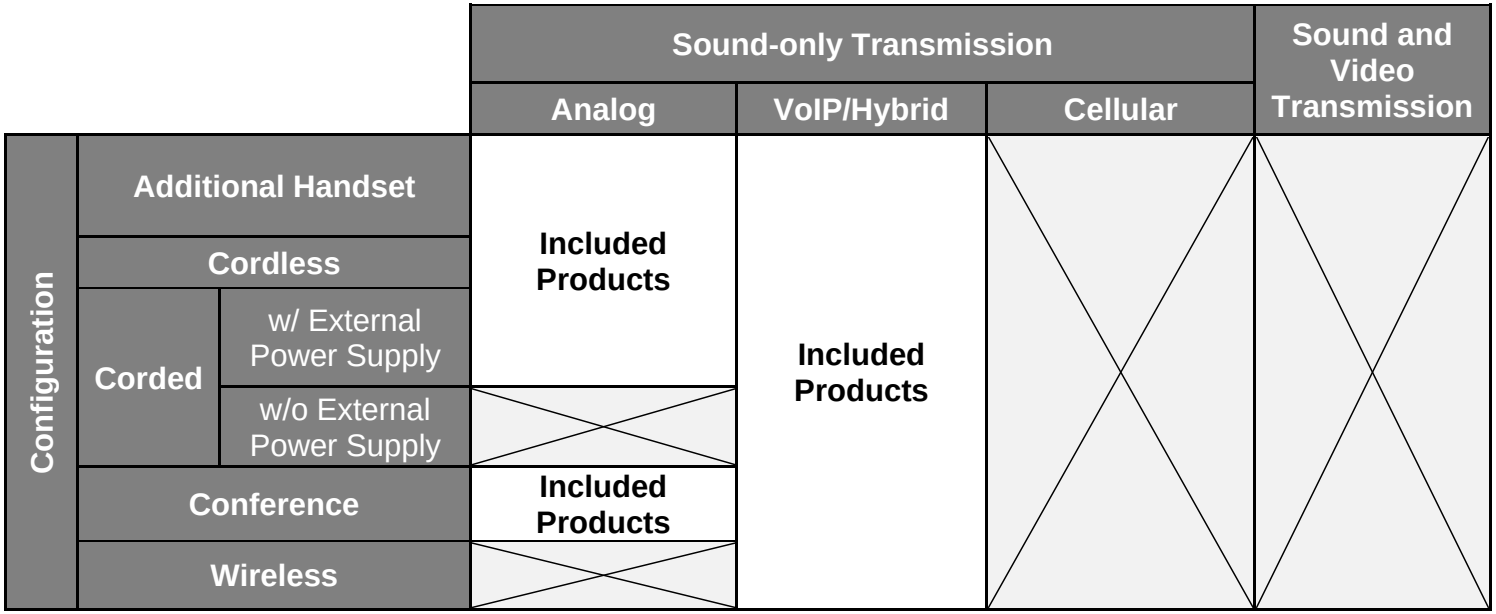
VoIP Phone Savings Opportunity

- EPA interested in energy savings potential in the growing market for VoIP phones
  - Always-on VoIP hardphones consume 2–6 W
    (Source: Baset and Schulzrinne. *Energy Efficiency of Voice-over-IP Systems*. Columbia University 2010)
  - Savings up to 60% achievable within a product class
    (Source: Tolly Enterprises, LLC, 2010)
  - Hardphones can consume 80% of all the electricity in the VoIP system (Source: Tolly Enterprises, LLC, 2010)
  - IP phone shipments to business and consumers expected to exceed 40 million units in 2015 (Source: In-Stat)

Version 3.0 Scope Summary

The following products *are not eligible* for qualification under this specification as illustrated in Figure 1:

i. Cellular Telephones;
ii. Telephones that transmit both sound and video;
iii. Corded Analog Telephones without External Power Supplies; and
iv. Stand alone answering machines.



Scope Comments

EPA now welcomes comments on the proposed changes to the Scope.

Definitions: UUT

- The definition for UUT has been updated to state that the UUT includes only the base product (the Telephone) being tested for certification
  - Reduce confusion when referring to Telephones that are sold with Additional Handsets as part of a multi-handset system

Unit Under Test (UUT): The specific sample of a representative model undergoing measurement which ***includes only the*** base product (the Telephone) ***and not any*** Additional Handsets and accessories packaged with it, ***or an*** Additional Handset, ***not including*** any accessories packaged with it, depending on the product type being tested for qualification.

Definitions: Sound Transmission

- Other currently used multiple-access packet types (GSM, 4G LTE) have been included with CDMA in the definition of Cellular Telephone

- References to a specific physical connection type in the definitions for Analog and Hybrid Telephone have been removed, as multiple connection types can be used to transmit sound over the PSTN

Definitions: Cordless Telephone

- The term “charging base” for Cordless Telephone handsets has been updated to “cradle”
  - Aligns with the terms used in the DOE Uniform Test Method for Measuring the Energy Consumption of Battery Chargers, as specified in 10 CFR Part 430, Subpart B, Appendix Y

Cordless Telephone: A Telephone with a base station and a handset. The ***cradle*** of a Cordless Telephone or its External Power Supply is designed to plug into a wall outlet. Although the Cordless Telephone base has a permanent physical connection to the network, there is no physical connection between the portable handset and the network.

Definitions: Off Mode

- EPA would like to encourage enterprise phones to enter Off Mode during non-peak hours or during period of user absence via network prompts and user initiation

Off Mode: A mode that may persist for an indefinite time when a Telephone is connected to a power source and a telephone line or other physical or wireless network connection and is NOT capable of receiving a call absent external stimulus such as network initiation, physical interaction with the receiver or other part of the Telephone.

Definitions Comments

EPA now welcomes comments on the proposed changes to the Definitions.

Qualification Criteria Overview

- EPA is proposing the following power requirement structure:
  1. Base functionality allowances based on phone configuration and sound transmission mechanism;
  2. Additional functionality allowances where needed to account for performance differences; and
  3. Incentives to encourage the adoption of energy saving features
- Similar to other related ENERGY STAR products (STBs, Small Network Equipment)

Draft 1 Power Requirements

Equation 1: Power Requirement

$$(P_{P\_ON} - P_{OFF\_INCENTIVE}) \leq P_{MAX}$$

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$$(P_{P\_ON} - P_{OFF\_INCENTIVE}) \leq P_{MAX}$$

Equation 2: Maximum Average Power

$$P_{MAX} = P_{BASE} + \sum_{i=1}^{n} P_{ADDi} + P_{PROXY}$$

Draft 1 Power Requirements

Equation 1: Power Requirement

$$(P_{P\_ON} - P_{OFF\_INCENTIVE}) \leq P_{MAX}$$

Equation 2: Maximum Average Power

$$P_{MAX} = P_{BASE} + \sum_{i=1}^{n} P_{ADDi} + P_{PROXY}$$

Equation 3: Off Mode Incentive

$$P_{OFF\_INCENTIVE} = 0.25 * (P_{P\_ON} - P_{OFF})$$

Draft 1 Base Allowances

$$P_{MAX} = P_{BASE} + \sum_{i=1}^{n} P_{ADDi} + P_{PROXY}$$

Product Type	P_{BASE} (watts)
Tested VoIP and Hybrid Cordless, Wireless, and Corded Telephones	2.0
Tested VoIP and Hybrid Conference Telephones	2.5
Analog Cordless, Corded, and Conference Telephones	0.9
Additional Handsets Analog and VoIP	0.3

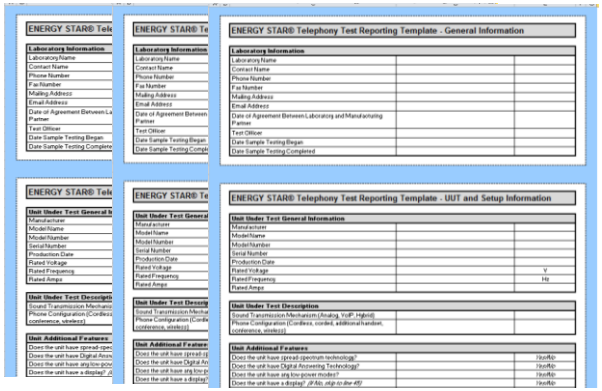
Draft 1 Additional Functional Adders

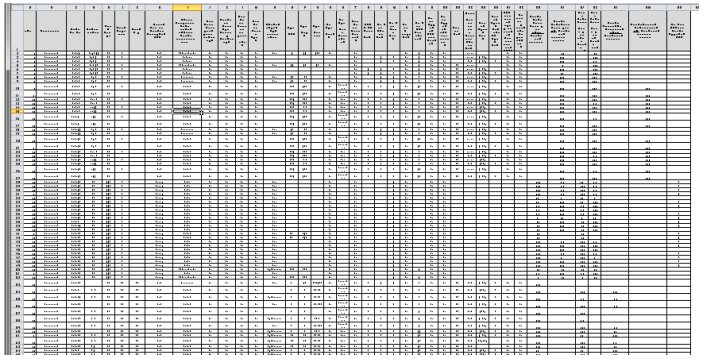
$$P_{MAX} = P_{BASE} + \sum_{i=1}^{n} P_{ADDi} + P_{PROXY}$$

Feature	Power Allowance P_{ADD} (watts)	Notes
Gigabit Ethernet (1000Base-T)	1.0	Applies if the Telephone has one or more Gigabit Ethernet ports.
IEEE 802.3az compliant Gigabit Ethernet	0.2	Telephony products that ship with IEEE 802.3az compliant Gigabit Ethernet ports may claim a 0.2 watt additional incentive

Draft 2 Test Method Data Assembly Summary

- EPA received test data from manufacturers





Anonymized dataset located on the ENERY STAR website at www.energystar.gov/revisedspecs

Manufacturer	Analog			VoIP			Total
	Additional Handset	Corded	Cordless	Cell Station	Conference	Corded	
A	-	-	-	2	2	8	**12**
B	2	2	21	-	-	-	**25**
C	-	-	-	-	1	13	**14**
Total	**2**	**2**	**21**	**2**	**3**	**21**	**51**

Supplemental Analog Data

- EPA supplemented the Analog dataset with ENERGY STAR Version 2.2 certified models

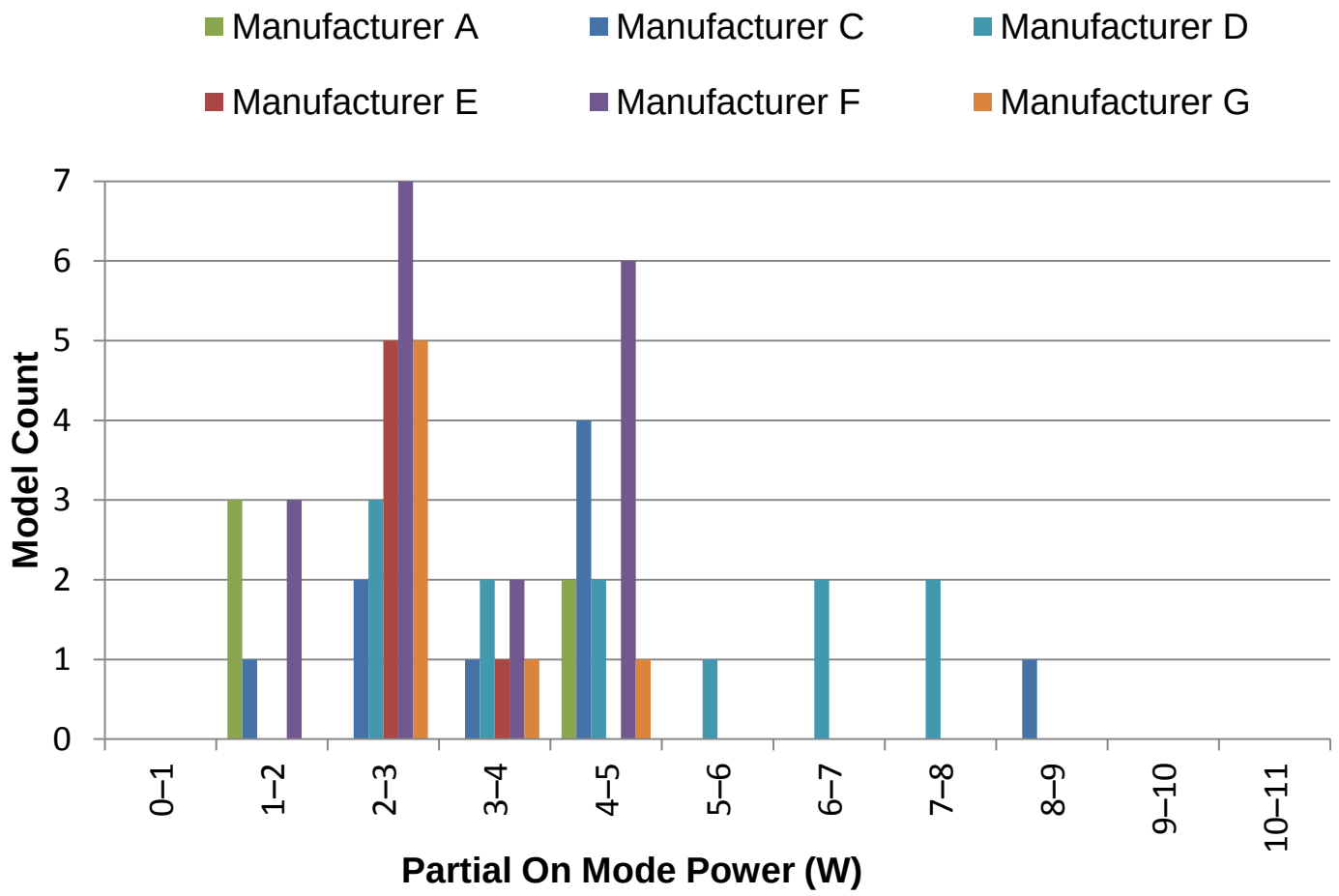
ENERGY STAR Partner	Additional Handset Only	Answering Machine	Combination Unit	Cordless Telephone	Total
Binatone Electronics	11	-	41	8	**60**
CCT Tech USA Inc.	6	-	4	5	**15**
Doro AB	-	-		12	**12**
Gigaset	5	-	8	6	**19**
Panasonic	27	-	174	46	**247**
RadioShack	2	-	3	1	**6**
Swissvoice HK LTD	-	-	-	1	**1**
Uniden	20	-	107	23	**150**
VTech	52	1	162	72	**287**
Total	**123**	**1**	**499**	**174**	**797**

Supplemental VoIP Data

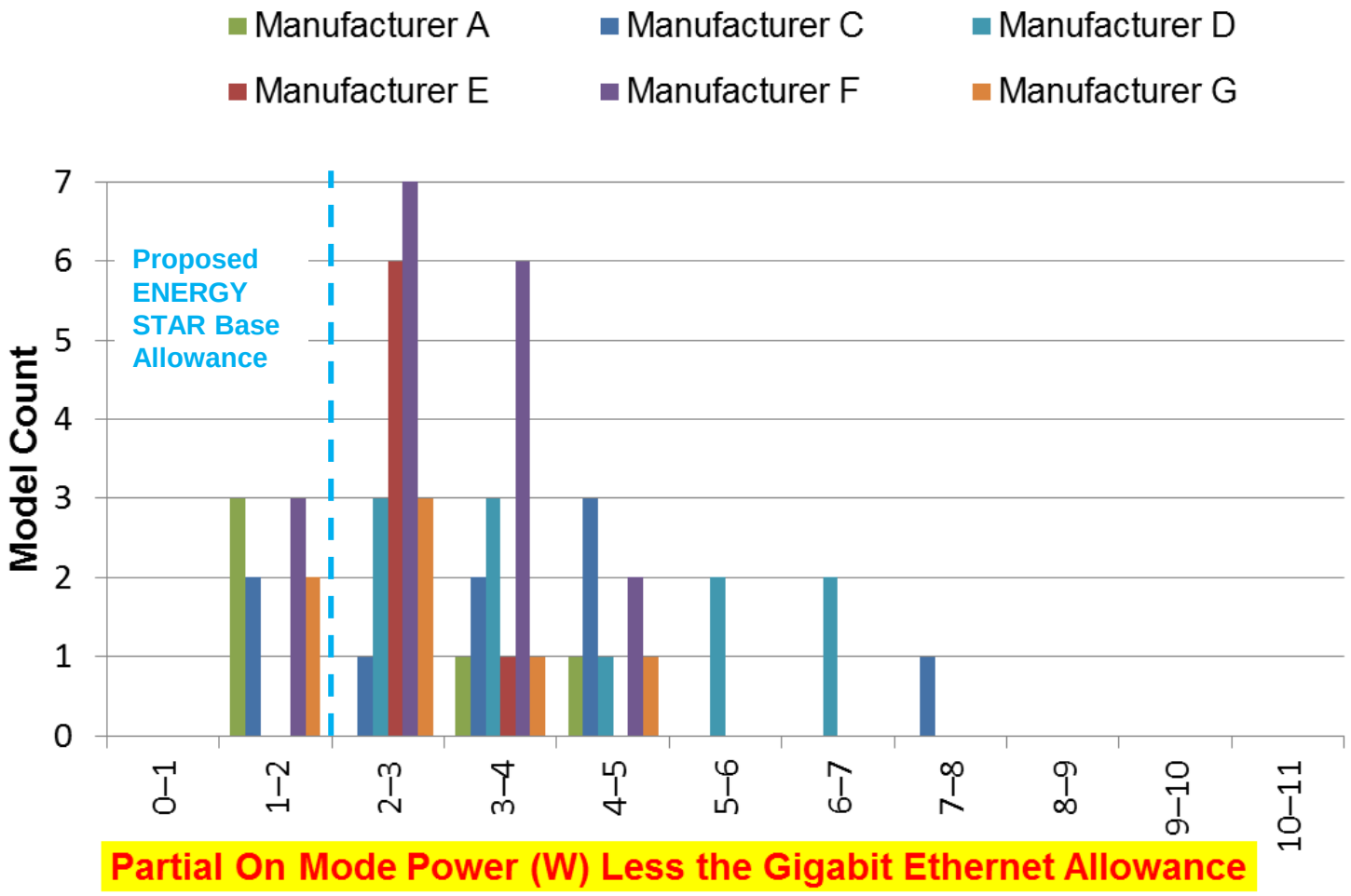
- EPA supplemented the VoIP dataset with model data from specification sheets on the Web

	VoIP	
Manufacturer	Conference	Corded
D	-	10
E	-	8
F	4	17
G	-	6
Total	**4**	**41**

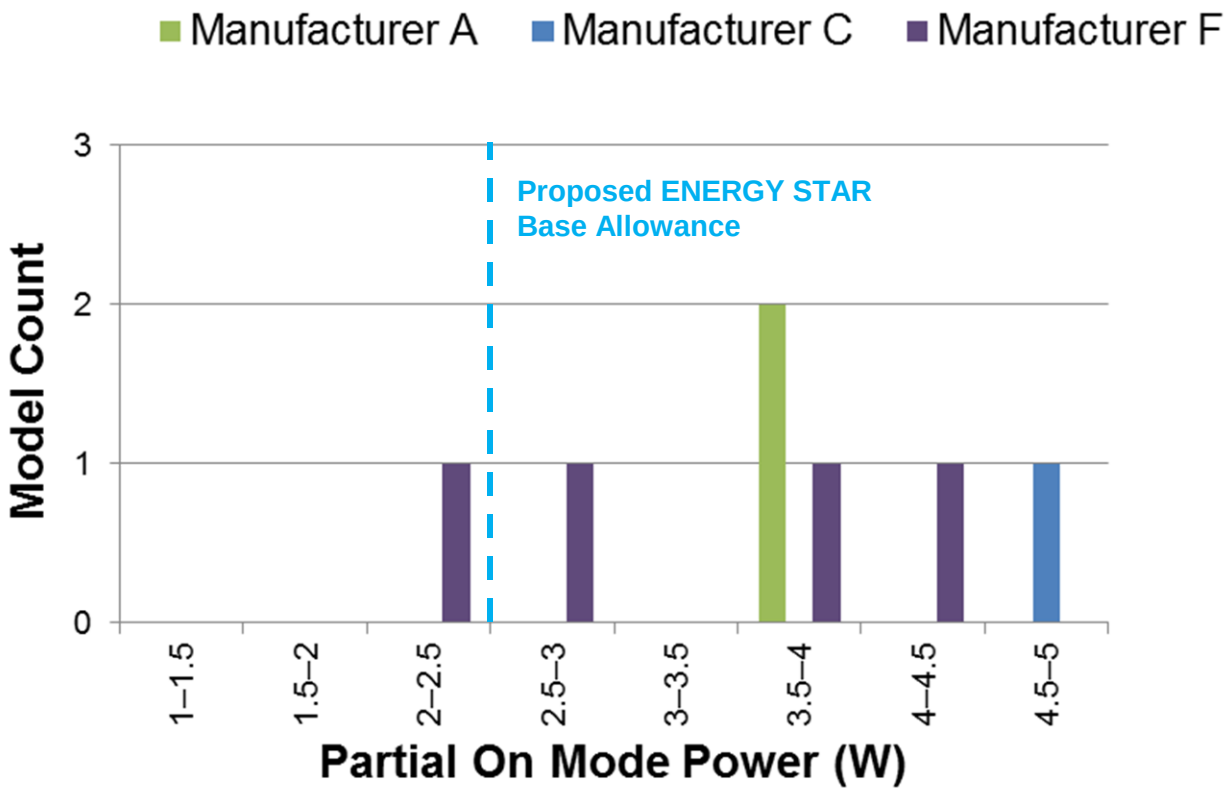
Corded VoIP Data



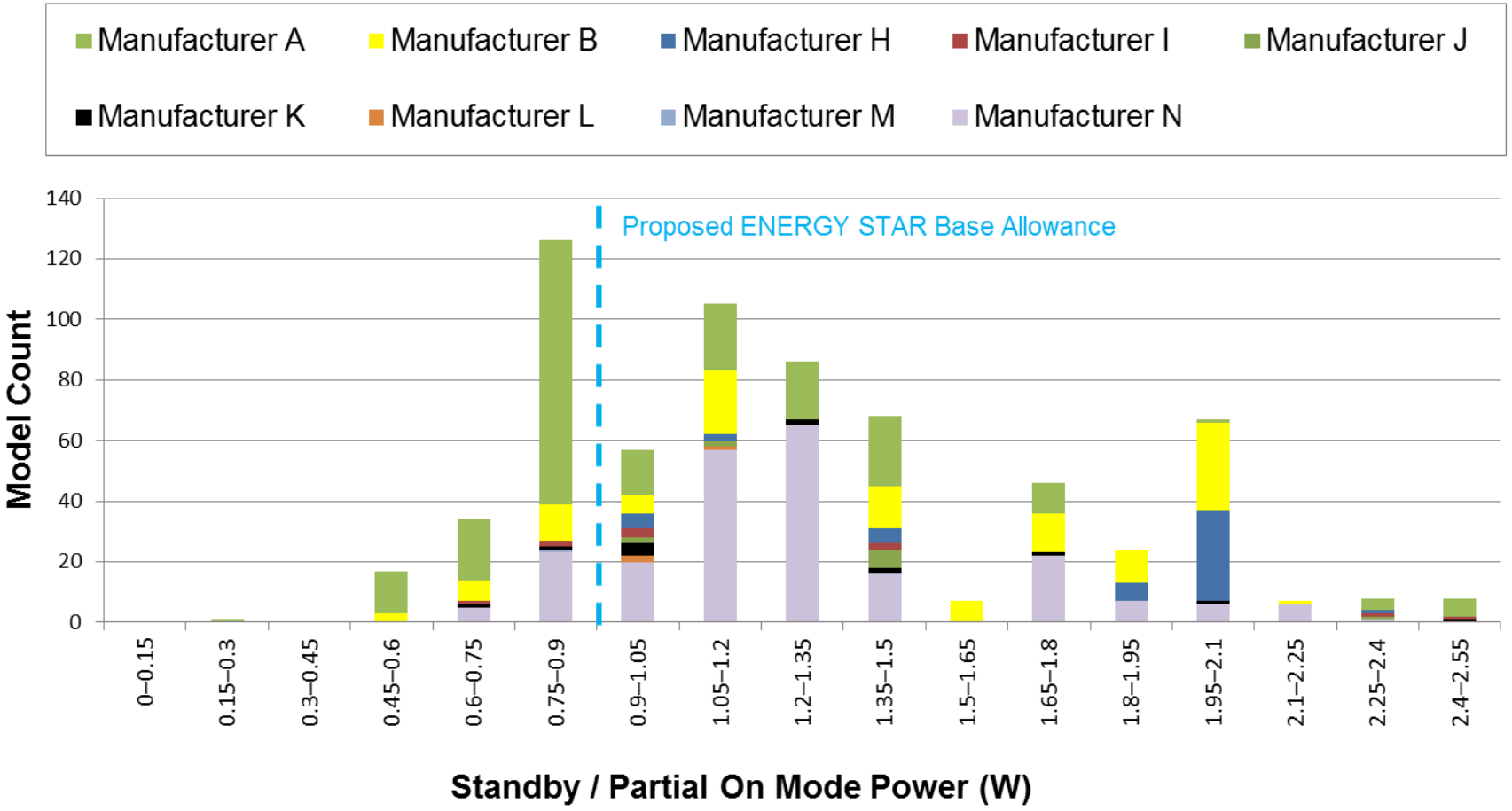
Corded VoIP Data Cont'd



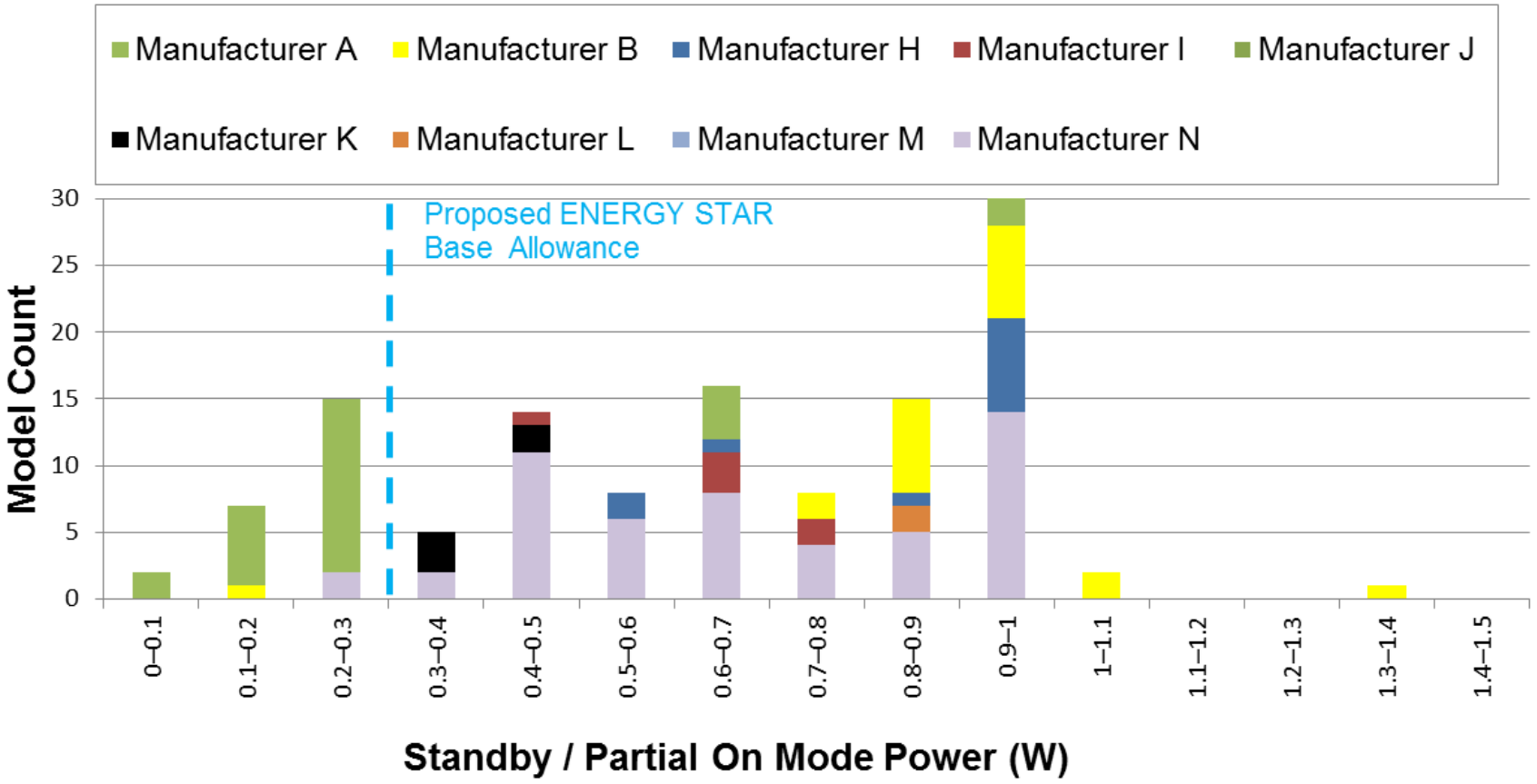
Conference VoIP Data



Cordless Telephones Analog V2.2 Data



Additional Handsets Analog V2.2 Data



Additional Features

- EPA did not find that the following features contributed significantly to power use in Partial On Mode:
  - Color display
  - Bluetooth
  - Number of voice lines
  - Answering machine capability

Answering Machine Capability

- EPA is not proposing an allowance for digital answering in Analog Telephones
  - Function is not tested by the Draft 3 ENERGY STAR Test Method
  - Data show it does not contribute significantly to Partial On Mode (Standby) power

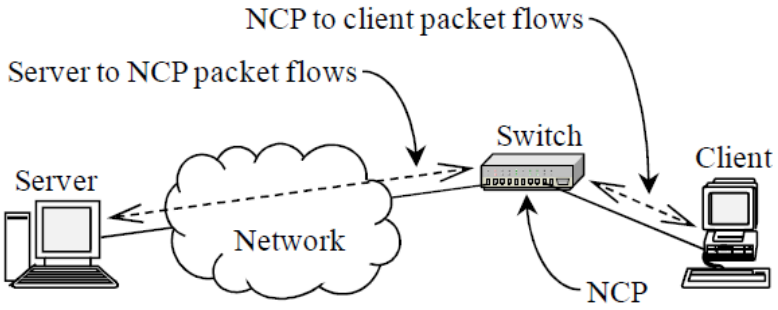
	No Answering Machine (Cordless Telephone)	Answering Machine Capability (Combination Unit)
Version 2.2 Standby Power (watts)	1.28	1.29

Allowance Comments

EPA now welcomes comments on the Base and Additional Functionality allowances.

External Proxy Incentive

- EPA is proposing an incentive to encourage the adoption of external proxy capability
  - Provides the ability for End Point Devices to maintain Full Network Connectivity while entering a sleep state
  - If all the desktop computers that are left on could enter low power mode through proxying, **EPA estimates savings of over $180M annually**



Note: The NCP within the switch covers for the client host when it is sleeping to maintain full network presence.

Figure 1. System view of the NCP

Proxy Incentive Values

$$P_{MAX} = P_{BASE} + \sum_{i=1}^{n} P_{ADDi} + P_{PROXY}$$

Capability	Pproxy (watts)
Base Capability	0.3
Remote Wake	0.5

More Efficient

- **Base Capability:** To maintain addresses and presence on the network while in LPM, the system handles IPv4 ARP and IPv6 NS/ND.
- **Remote Wake:** While in LPM, the system is capable of remotely waking upon request from outside the local network. Includes Base Capability.

Off Mode Incentive

- EPA is proposing an incentive for phones that can enter a very low power state
  - EPA is aware of controller and microprocessor components compliant with IEEE 802.3-2012 that may be capable of enabling VoIP Telephones to enter Off Mode
  - A phone operating on average 8 hours a day at 4 W in Partial On Mode could save approximately 20 kWh a year by operating at 0.5 W for the other 16 hours a day (excludes savings on the network side)

Off Mode Incentive

- Power savings subtracted from measured power when comparing to requirement:

$$P_{OFF\_INCENTIVE} = 0.25 * (P_{P\_ON} - P_{OFF})$$

Where:
$P_{OFF\_INCENTIVE}$ is the value subtracted from measured Partial On Mode power in Equation 1;
P_{P_ON} is the measured Partial On Mode power (W); and
P_{OFF} is the measured Off Mode power (W).

Equation 1: Power Requirement

$$(P_{P\_ON} - P_{OFF\_INCENTIVE}) \leq P_{MAX}$$

Off Mode Incentive

- EPA invites stakeholder feedback on the following:
  - Data on the expected power in this mode - EPA assumes that power levels of 0.5 – 1.0 W may be feasible based on other electronic devices
  - Whether the Telephone would be capable of receiving calls at these low power levels
  - Market and network demands regarding wake time/latency
  - Prevalence of this mode in current and near term models

Incentive Comments

EPA now welcomes comments on the Proxy and Off Mode Incentives.

Power Management Requirements

- EPA is proposing the following power management requirements to encourage the use of Off Mode and other low power states:

  i. Device initiated automatic power down to Off Mode after a scheduled time or predetermined period of timing has elapsed following the cessation of primary and secondary functions, user input, or connected device activity.

  ii. Network activated automatic power down of the device to Off Mode per programmable or default settings.

  iii. Manual activation of Off Mode by the end-user via a clearly marked button or electronic menu option.

Power Management (cont'd)

- For all Telephones EPA is proposing the following for displays:

3.4.2 Color and backlit displays shall power down to the default Partial On Mode test state in less than 5 minutes after the cessation of user input.

User Information Requirements

- Similar to other consumer and enterprise products such as computers, EPA proposes that ENERGY STAR partners educate network operators and end-users about the power management features:

3.5.1. Products shall be shipped with informational materials to notify customers and operators of the following:

i. A description of default power management settings.

ii. Guidance for enabling available power management features at the network and device level including but not limited to Off Mode, External Network Proxy, and automatic and timed power down.

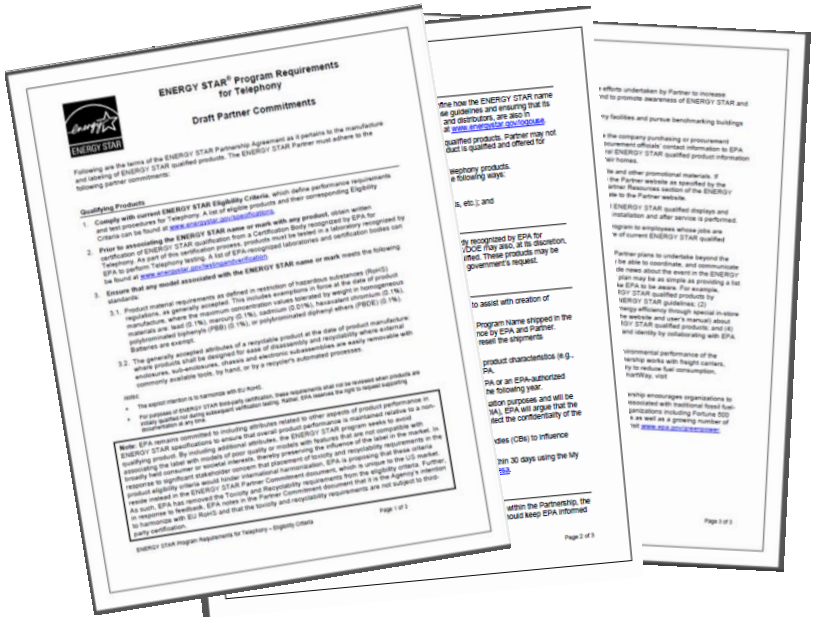
iii. Information about ENERGY STAR and the benefits of power management, to be located at or near the beginning of the hard copy or electronic user manual, or in a package or box insert.

Other Requirements Comments

EPA now welcomes comments on the Power Management and User Information requirements.

Draft Partner Commitments

- With this presentation EPA will post the Draft Version 3.0 Telephony Partner Commitments to www.energystar.gov/revisedspecs
  - EPA is proposing the inclusion of toxicity and recyclability requirements for all consumer electronics products in the ENERGY STAR program


ENERGY STAR® Program Requirements for Telephony

Draft Partner Commitments

Toxicity and Recyclability

- ENERGY STAR: differentiating products based on energy efficiency only
- In developing these requirements, EPA seeks to avoid associating the ENERGY STAR label with poor quality or otherwise undesirable products
- Many ENERGY STAR product specifications (e.g., lighting) incorporate non-energy requirements. Reflects longstanding practice of ensuring that ENERGY STAR products deliver on consumer expectation for quality

Toxicity and Recyclability

In making CE purchase decisions, factors such as price (95%) and product features (88%) are most vital in purchase decision making.

Surprisingly, environmental factors, including energy consumption (85%) and the ability to recycle a device (70%) were highly rated on the decision tree (above elements such as brand and size) – a possible indication that these considerations are weighing more heavily on consumers' minds.

- Source: *Consumer Electronics Association*, "Powering Intelligent Electricity Use," 2011

Toxicity and Recyclability

- Non-energy requirements are exempt from third party certification process
- Non-energy requirements are not intended for international adoption
- When products are sold in countries other than the U.S., they are not subject to proposed non-energy requirements

Standard CE/IT Toxicity and Recyclability Language

- Product material requirements as defined in restriction of hazardous substances (RoHS) regulations, as generally accepted. This includes exemptions in force at the date of product manufacture, where the maximum concentration values tolerated by weight in homogeneous materials are: lead (0.1%), mercury (0.1%), cadmium (0.01%), hexavalent chromium (0.1%), polybrominated biphenyls (PBB) (0.1%), or polybrominated diphenyl ethers (PBDE) (0.1%). Batteries are exempt.

- The generally accepted attributes of a recyclable product at the date of product manufacture: where products shall be designed for ease of disassembly and recyclability where external enclosures, sub-enclosures, chassis and electronic subassemblies are easily removable with commonly available tools, by hand, or by a recycler's automated processes.

Partner Commitments Comments

EPA now welcomes comments on the Partner Commitments.

Next Steps

1. Draft 3 Test Method Update
2. Draft 1 Specification Update
3. Next Steps

Open Comment

- EPA would now like to open up the line for any general comments from stakeholders.

Test Method Development Timeline

Draft 2 Version 3.0 Test Method to stakeholders	December 2012
Draft 2 Version 3.0 Test Method comments due	December 2012
Draft 3 Version 3.0 Test Method to stakeholders	June 2013
Draft 3 Version 3.0 Test Method comments due	July 2013
Final Draft Version 3.0 Test Method to stakeholders	Summer 2013
Final Draft Version 3.0 Test Method comments due	Summer 2013
Final Version 3.0 Test Method	Fall 2013

Specification Development Timeline

- EPA proposes the following timeline:

Next Step	Date
Stakeholder Webinar	Tuesday, July 9, 2013
Draft 1 Specification & Draft 3 Test Method Comment Period Ends	Friday, July 19, 2013
Draft 2 Specification Published	Summer 2013

Written Comments

In addition to making verbal comments during today's call, stakeholders are encouraged to submit written comments to telephony@energystar.gov.

Comment Deadline
Friday, July 19, 2013

Contact Information

Please send any additional comments to telephony@energystar.gov or contact:

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