ENERGY STAR Imaging Equipment Version 2.0 Draft 1

Stakeholder Meeting
March 7, 2012

EPA

Learn more at **energystar.gov**

Agenda

	Topic
10 – 10:10	Welcome - Introductions
10:10 – 10:20	EU
10:20 – 10:45	ITI
10:45 – 11:00	Product Scope
11:00 – 11:45	TEC
11:45 – 12:45	Network Connection - Adder
12:45 – 1:30	Lunch
1:30 –2:15	OM
2:15 – 2:30	Standby and Wakeup
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3:15 – 3:30	Non Energy
3:30 – 4:00	Summary – wrap up

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Meeting Introduction

- EPA thanks all stakeholders who have participated thus far in the revision of the ENERGY STAR specification for Imaging Equipment

- Stakeholder participation is critical to the specification development

Activities To Date

- EPA launched Version 2.0 development on March 11, 2011
- Since then, EPA and DOE have been developing the test method and revised specification approach
  - Draft 1, Draft 2, and Final Draft test methods
  - Draft 1 specification, including revised levels and revised approaches to OM and DFEs

Meeting Objectives

1. Explain Draft 1 proposals, including revised approaches to OM products and DFEs
2. Review impact of proposals on currently qualified models
3. Review comments received to date and prompt discussion

Remote Attendees

- Audio provided via conference call in:

  Call in: +1-877-423-6338 (inside the US, Canada)
  +1-571-281-2578 (outside the US, Canada)

  Code: 436-598

- Phone lines will remain on mute during presentations, opened during discussion

- Please keep phone lines on mute (*6) unless speaking

- Please refer to the agenda for approximate discussion timing

Meeting Conduct

- Meeting sections correspond to topics addressed in the Draft 1 specification
- EPA team will present work on each topic
  - Stakeholders are welcome to comment at any time
  - Additional time will be provided at the end of each section for broader discussion on each topic
  - Finally, open discussion on topics not covered during the presentation is scheduled at the end of the meeting (3:30 pm Eastern Time)

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European Union

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Information Technology Industry Council Comments

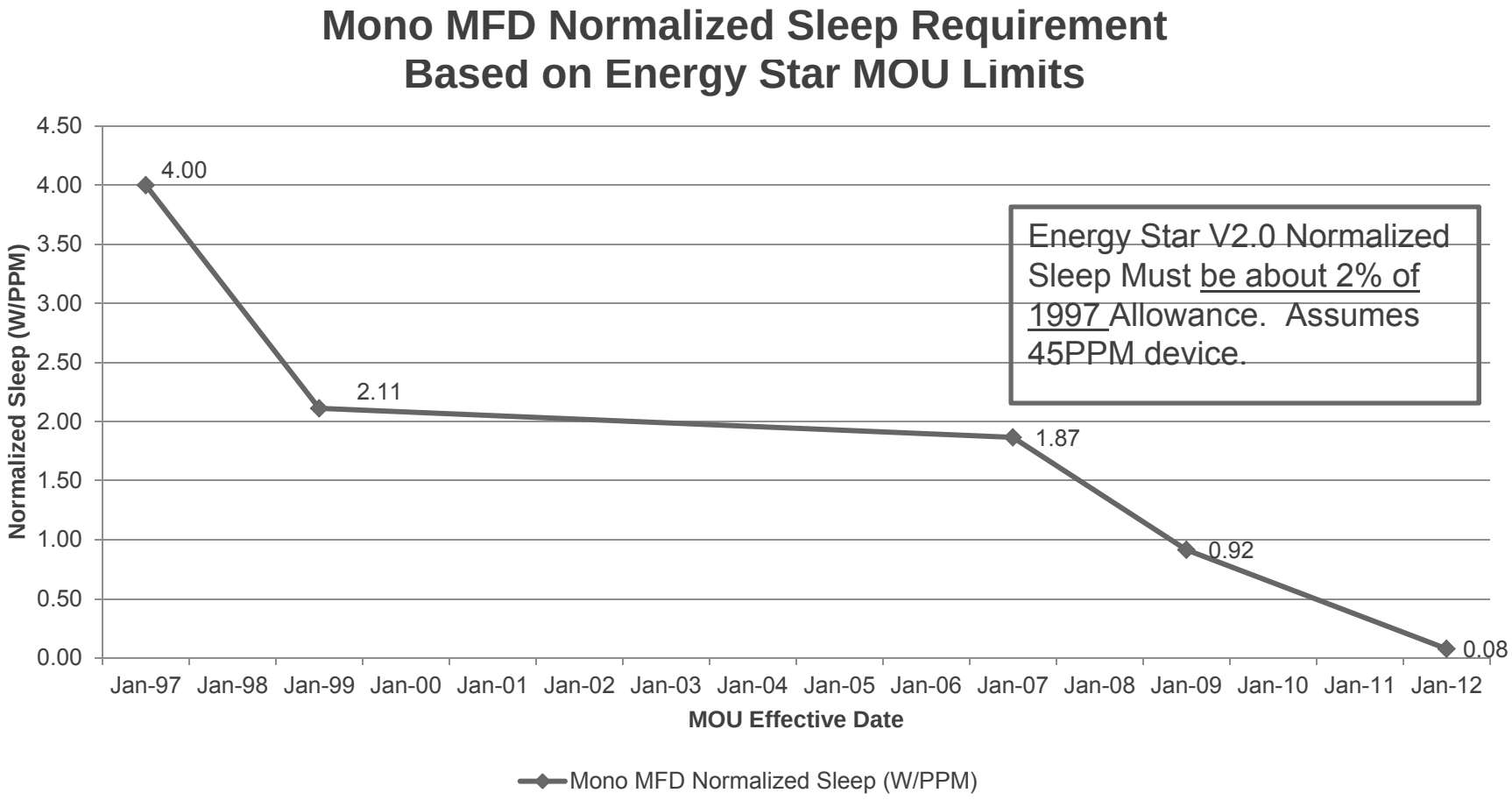
ITI Comments

- Trends in Imaging Market
- ITI's History with Energy Star
  - Imaging Products Improvement under Energy Star
- Data Set Concerns
  - Quality of Data
  - Treatment of Product Types
  - Criteria encourages simple products
- Concerns going forward
  - Certification Body Capacity
  - Timing for Enforcement

Trends in Imaging Equipment Market

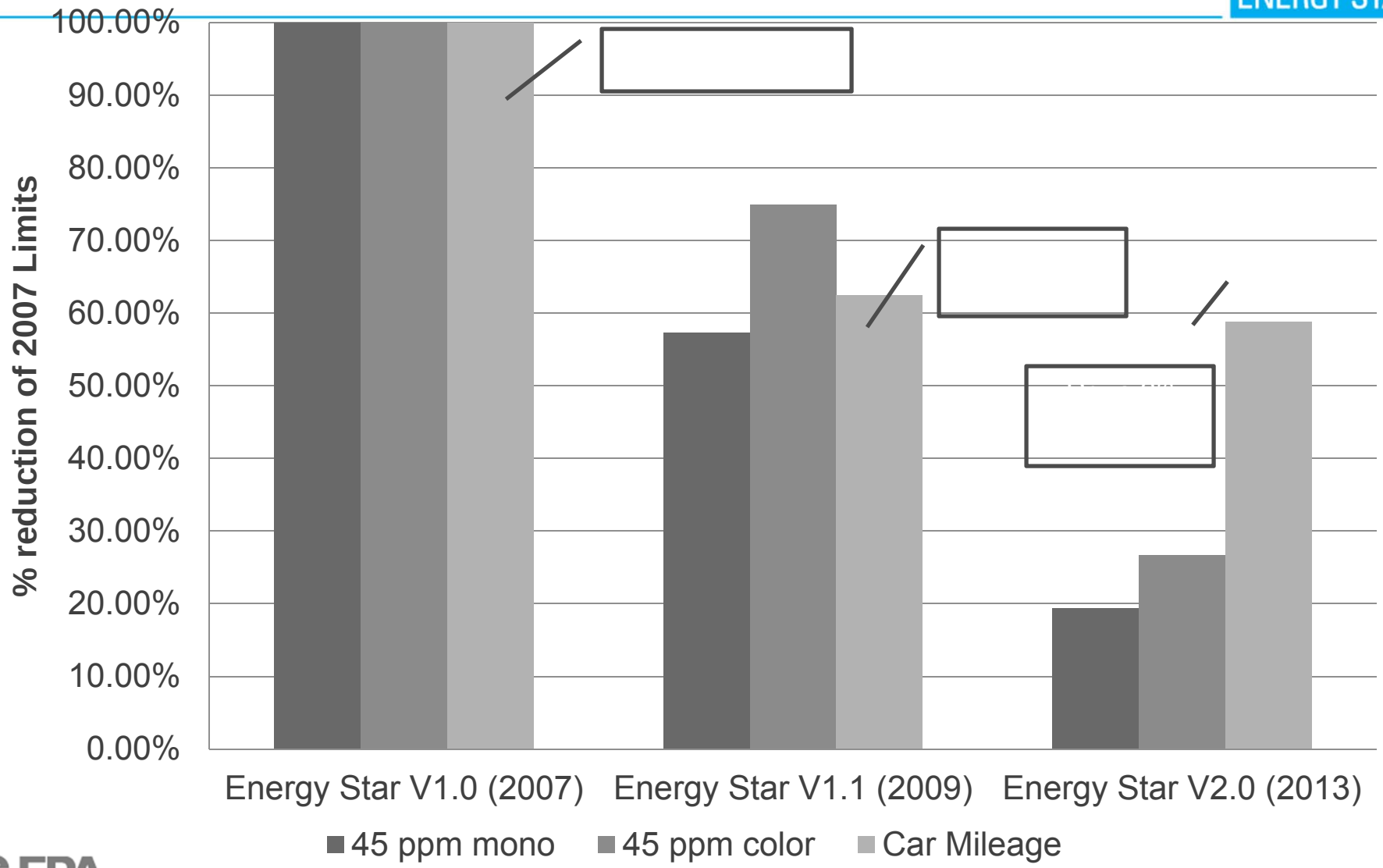
- Devices Connected all the time
  - Use/connection to Cloud/servers
  - Device Reporting/Auditing/Control
- Consolidation/Management of Devices
  - At OEM level (Print as a Service)
  - At the corporate Level (IT Management of printing as a cost)
- Features/Function rather than speed/technology
  - Growing use of “Apps”
  - Requirements of Security (card readers / Hard Disk Storage)

Historical View of Energy Star



Energy Star TEC Limit

45 ppm MFD / Automobile



Dataset concerns – Data Quality

- ITI has concerns about the quality of the data in the dataset
  - Would like EPA to comment on the source of the data
  - Would like EPA to comment on the source of non-ESTAR data points
  - Would like EPA to comment on the line setting algorithm

EPA ENERGY STAR DATA-Summary Data

EPA TEC Data Set Results (2-10-2012 data)

Product Category	Speed Range (PPM)	# Pass	# Fail	Total	% Pass	EPA Data Points	MFG Website Data Points
Mono Printer	0-19	25	5	30	83.3%	-	-
Mono Printer	20-39	73	71	144	50.7%	-	-
Mono Printer	40-75	22	120	142	15.5%	-	-
Mono Printer	76+	10	3	13	76.9%	-	-
Subtotals =		**130**	**199**	**329**	**39.5%**	**255**	**74**
Color Printer	0-19	35	21	56	62.5%	-	-
Color Printer	20-39	30	145	175		-	-
Color Printer	40-75	9	64	73		-	-
Color Printer	76+	11	14	25	44.0%	-	-
Subtotals =		**85**	**244**	**329**	**25.8%**	**263**	**66**
Mono MFD	0-20	32	108	140	22.9%	-	-
Mono MFD	21-40	72	284	356	2 2%	-	-
Mono MFD	41-60	24	154	178		-	-
Mono MFD	61+	33	89	122		-	-
Subtotals =		**161**	**635**	**796**	**20.2%**	**604**	**192**
Color MFD	0-20	32	65	97	33.0%	-	-
Color MFD	21-40	61	175	236	25.8%	-	-
Color MFD	41-60	40	90	130	30.8%	-	-
Color MFD	61+	19	71	90	21%	-	-
Subtotals =		**152**	**401**	**553**	**27.5%**	**454**	**99**
Totals =		**528**	**1479**	**2007**	**26.3%**	**1576**	**431**

- Lines tend to pass too many products at some speeds, Too few at others
- Products in mix are of varied Types / Costs / Markets

Criteria Limits encourage simpler/lower function products

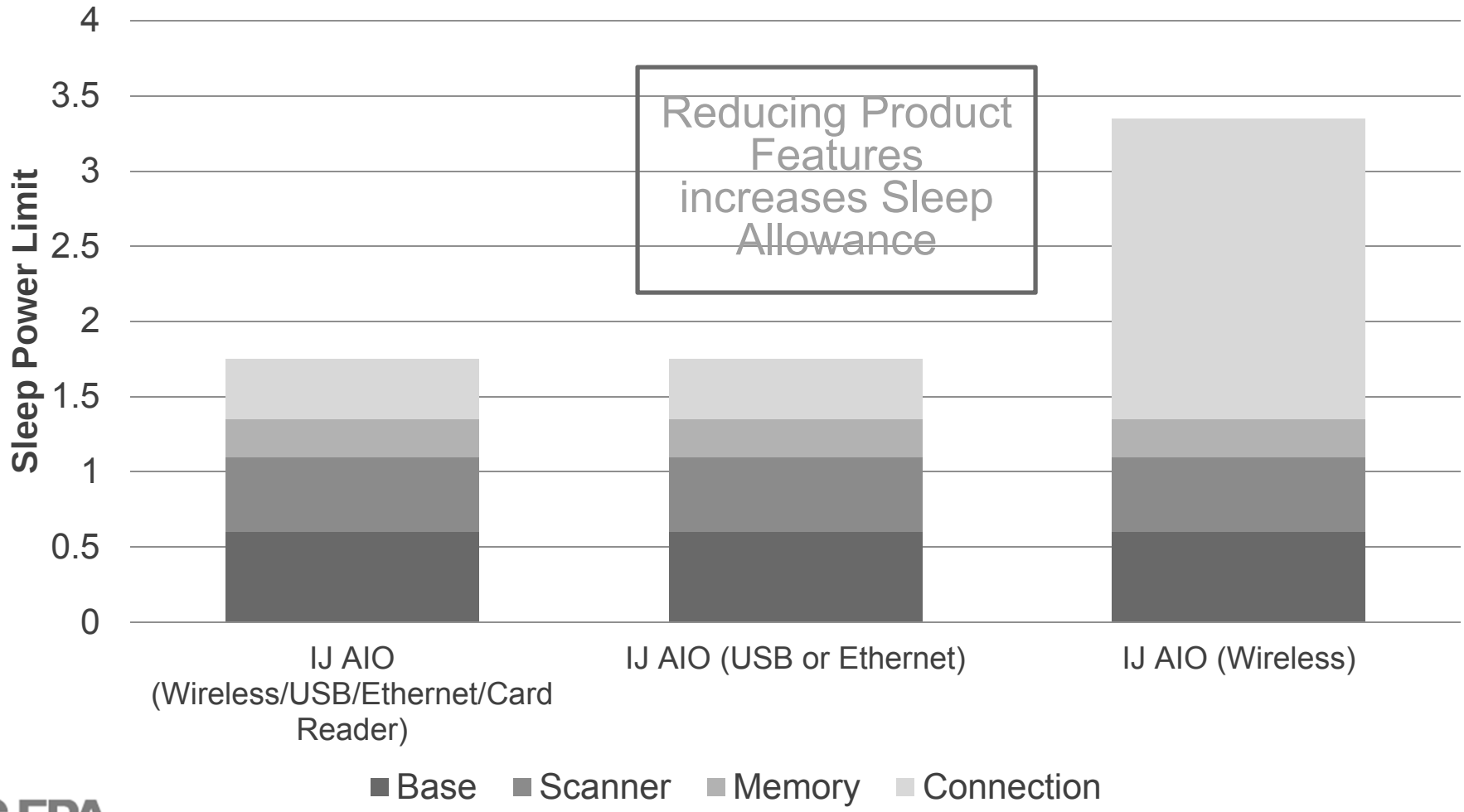
TC Example

- TEC products are typically 1 product :many users
- Same limit for Printer/Copier/Fax or MFD
  - No additional allowance for additional functionality (security, cloud apps, paper input/output support)
  - No additional allowance for different types of products / Markets

OM Example

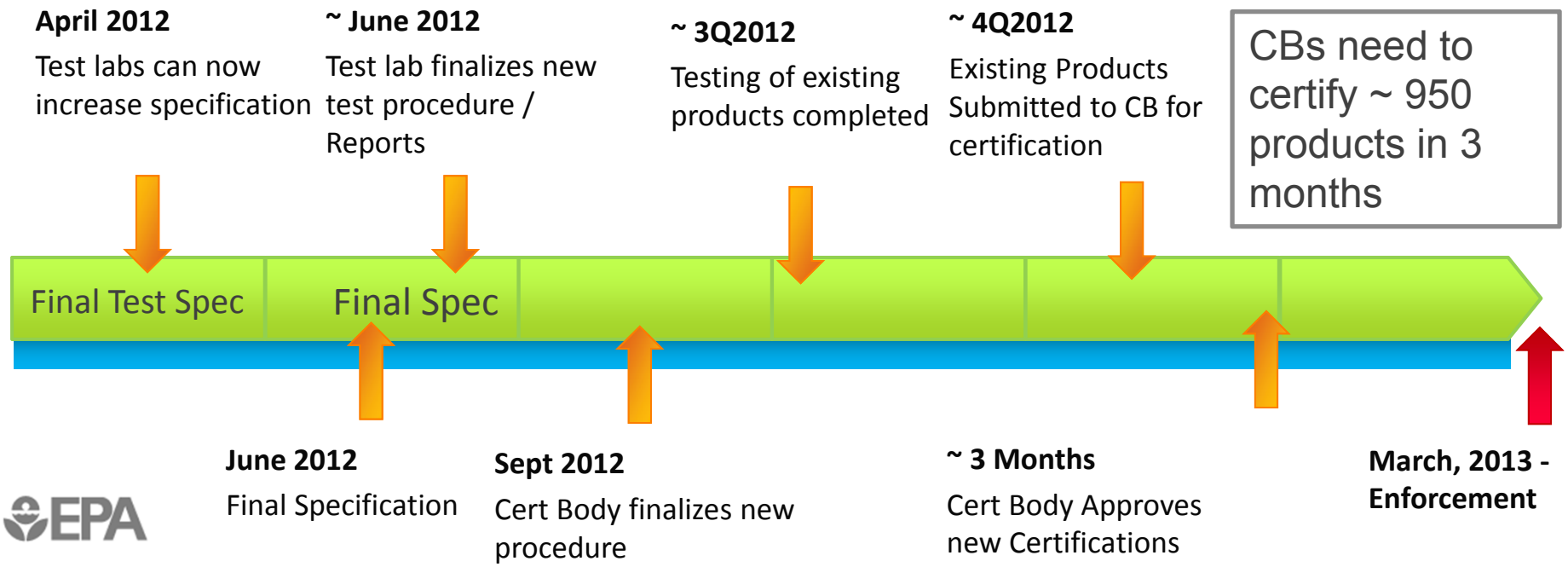
- OM products are typically 1 product :1 user
- Allowance for Scanners (i.e. more allowance for MFD vs SFP)
- Only allow 1 network connection (ethernet)
  - Encourages reduced connectivity
  - Energy Star recommending shutting off non-tested interfaces
    - Majority of home /SOHO users use Wireless

V2.0 Sleep Limit - Inkjet MFD Example



Concerns going Forward – Cert Body Schedule

- ITI is concerned about the ability of Certification Bodies to Certify Products under V2.0
  - Testing labs cannot test for V2.0 until the test method is final
  - Certification Bodies need time to develop new processes



Timeline Recommendations

- Transition
  - Testing for V1.2 is incompatible with V2.0 . <u>All models must be retested.</u>
  - Labs have to wait for the finalized test procedure to increase accreditation
    - New requirements require new equipment / new processes (2-3 month time to increase to V2.0)
  - CBs must have new processes also
  - 9 months in insufficient to qualify <u>existing</u> models
- Recommend
  - At least 15-18 months lead time or
  - Temporary (6-9 months) grandfathering of products under V1.1/V1.2
  - Certification workshop with EPA/Industry/Test Labs/CBs within 4 weeks of final spec release

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Product Scope

Product Scope

- Propose retaining both scanners and fax machines with eligible scope
  - Stakeholder feedback noted
    - importance to retain for institutional purchasers
    - prevent substitution purchasing of higher featured and more consumptive products

Product Scope

- Propose including:
  - Standard format Impact MFDs
    - Evaluate using Operational Mode (OM) Approach
  - Small format high performance ink jet
    - Evaluate using typical electricity consumption
    - Paper is slightly smaller than standard
    - Usage pattern would be similar to other TEC products

Comments on the proposal

- Questions raised on how a small format high performance ink jet can be tested under TEC which requires standard paper
- Request to re-examine inclusion of remanufactured products
  - Not specifically excluded (or included) but EPA does not support grandfathering for older spec requirements

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Maximum TEC Requirements

TEC Re-categorization

- Analysis shows that MFD products can perform as well, if not better, than printers of the same color capability and speed

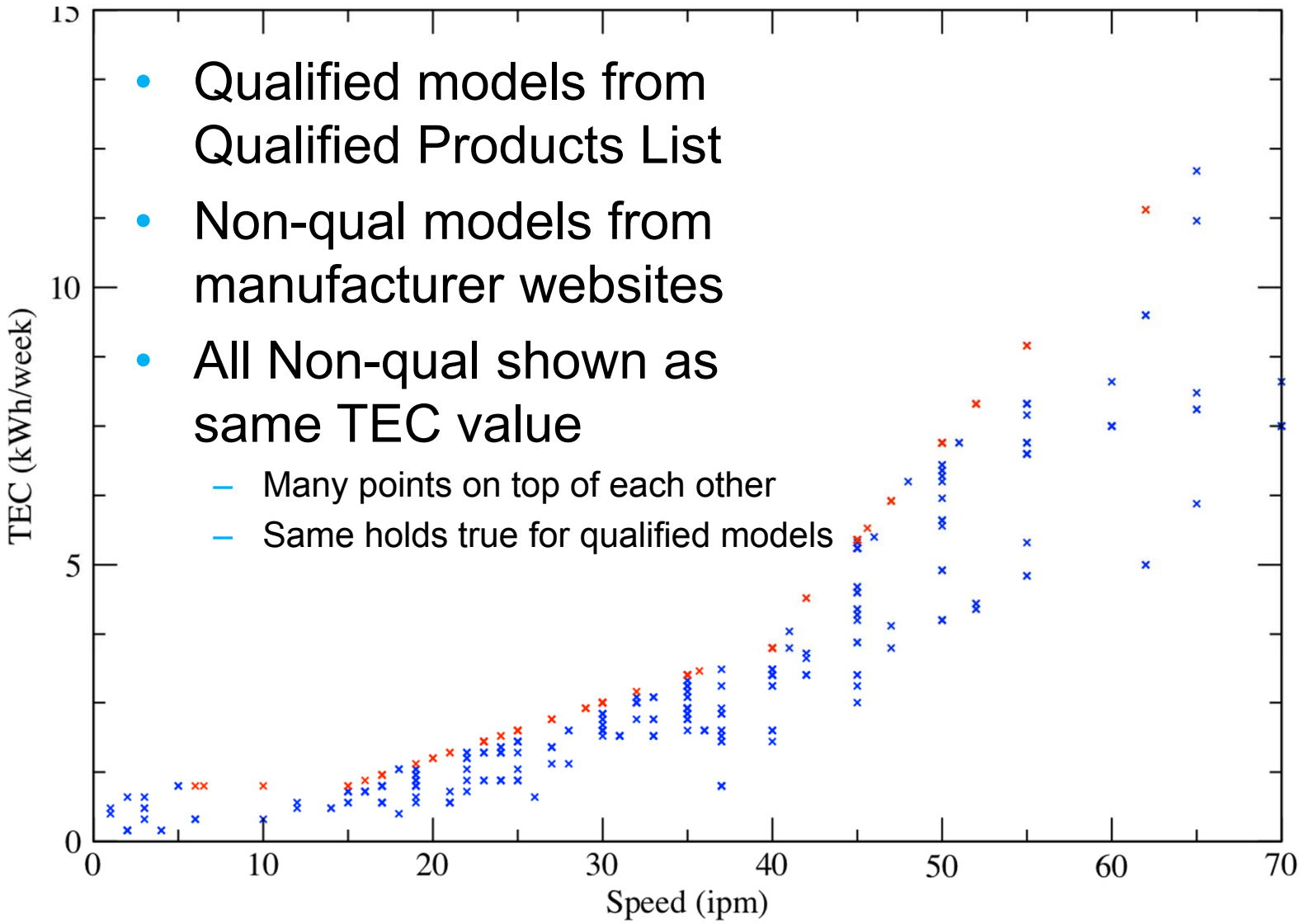
Current TEC Category	Proposed TEC Category
B&W printer, copier, fax, DD	B&W printer, copier, fax DD, **& MFD**
B&W MFD	
Color printer, copier, fax DD	Color printer, copier, fax DD, **& MFD**
Color MFD	

TEC – V1.x Approach

- Limits expressed in kWh/week
- 4 TEC categories – MFD/non-MFD and Mono/Color
- No adders
- Limit a series of straight lines based on speed
  - Derived from data on available models
  - Slopes increase with higher speeds
  - Common slopes used across different product types

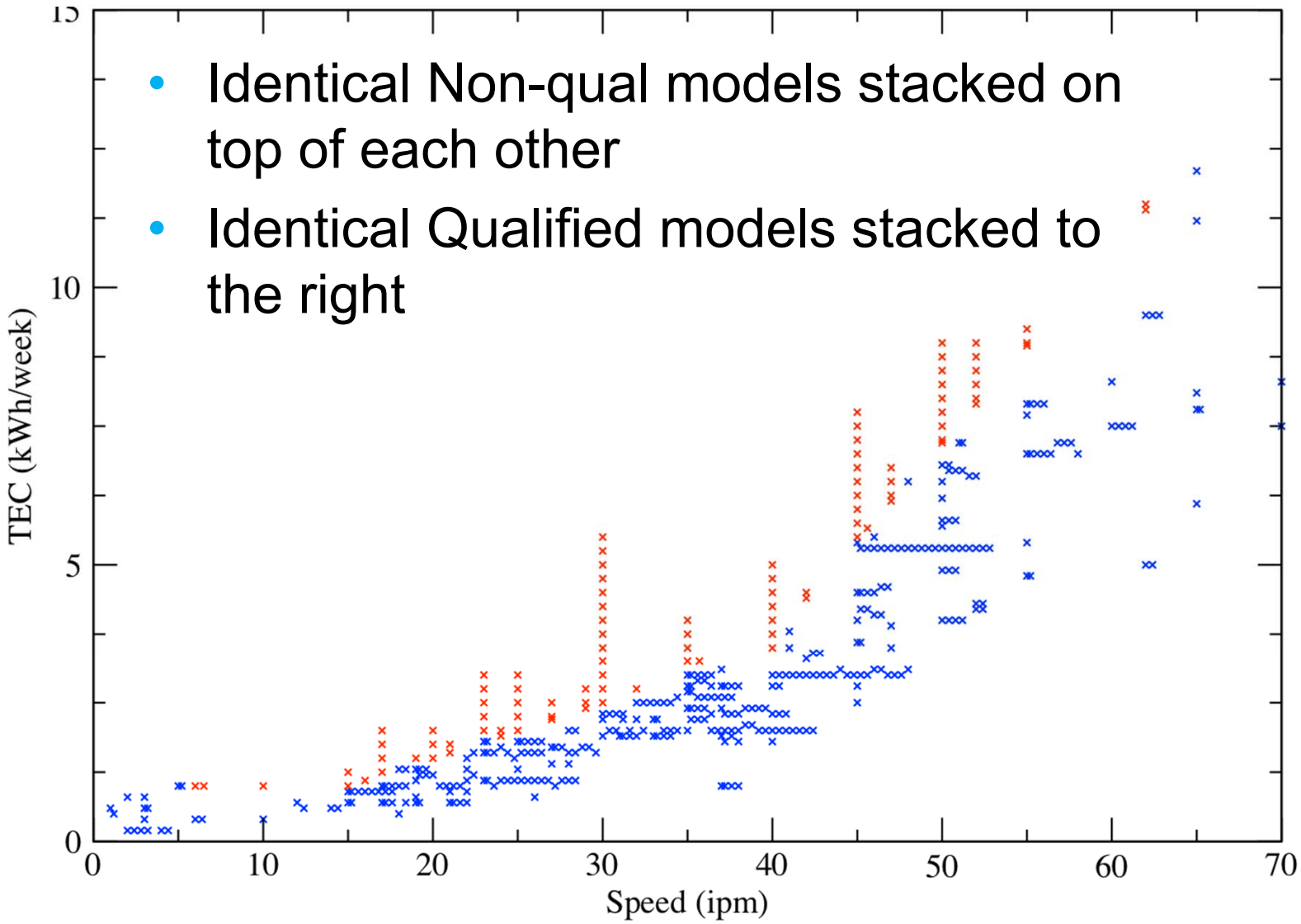
TEC – Mono Non-MFDs

- Qualified models from Qualified Products List
- Non-qual models from manufacturer websites
- All Non-qual shown as same TEC value
  - Many points on top of each other
  - Same holds true for qualified models

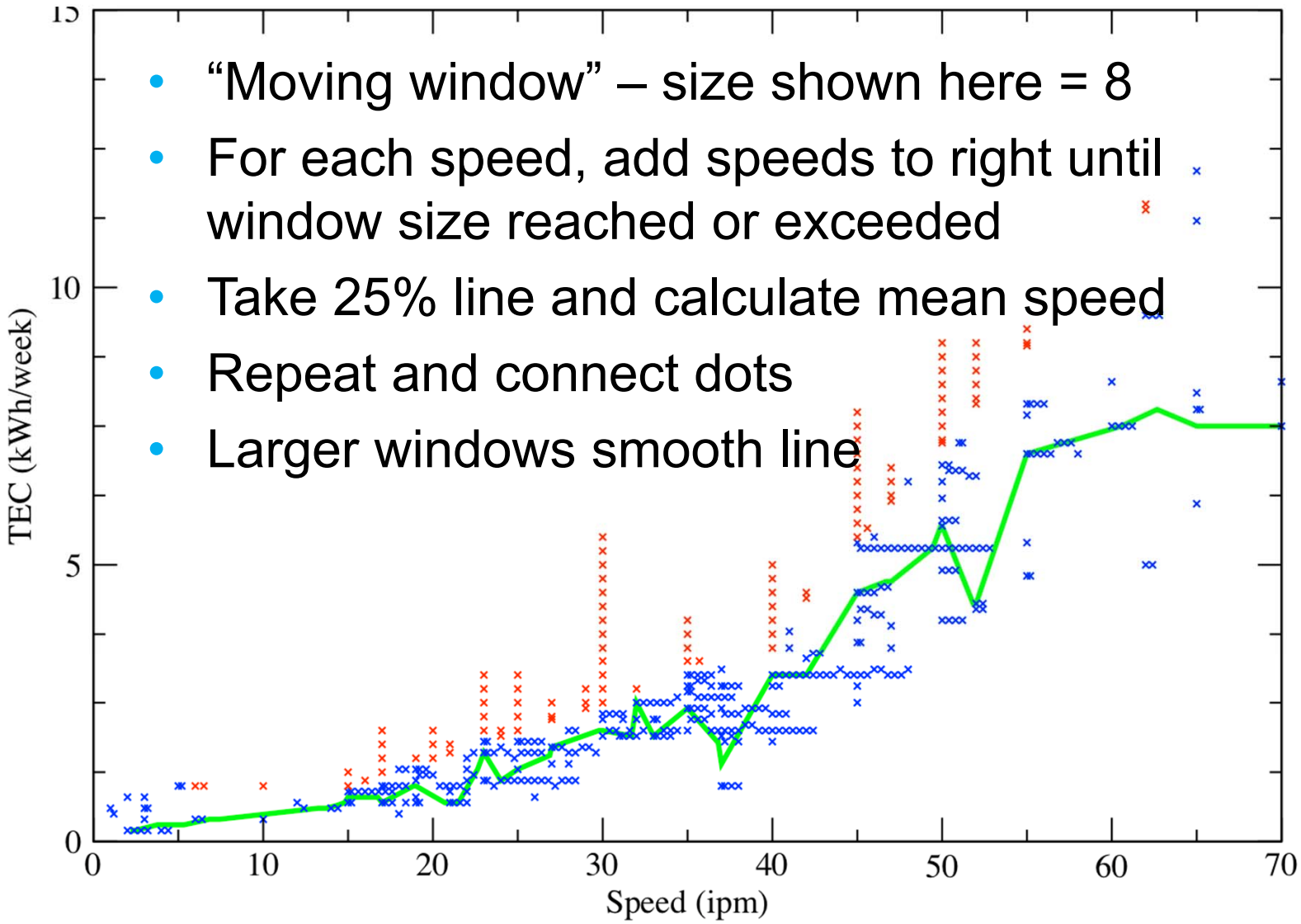


TEC – Mono Non-MFDs (2)

- Identical Non-qual models stacked on top of each other
- Identical Qualified models stacked to the right

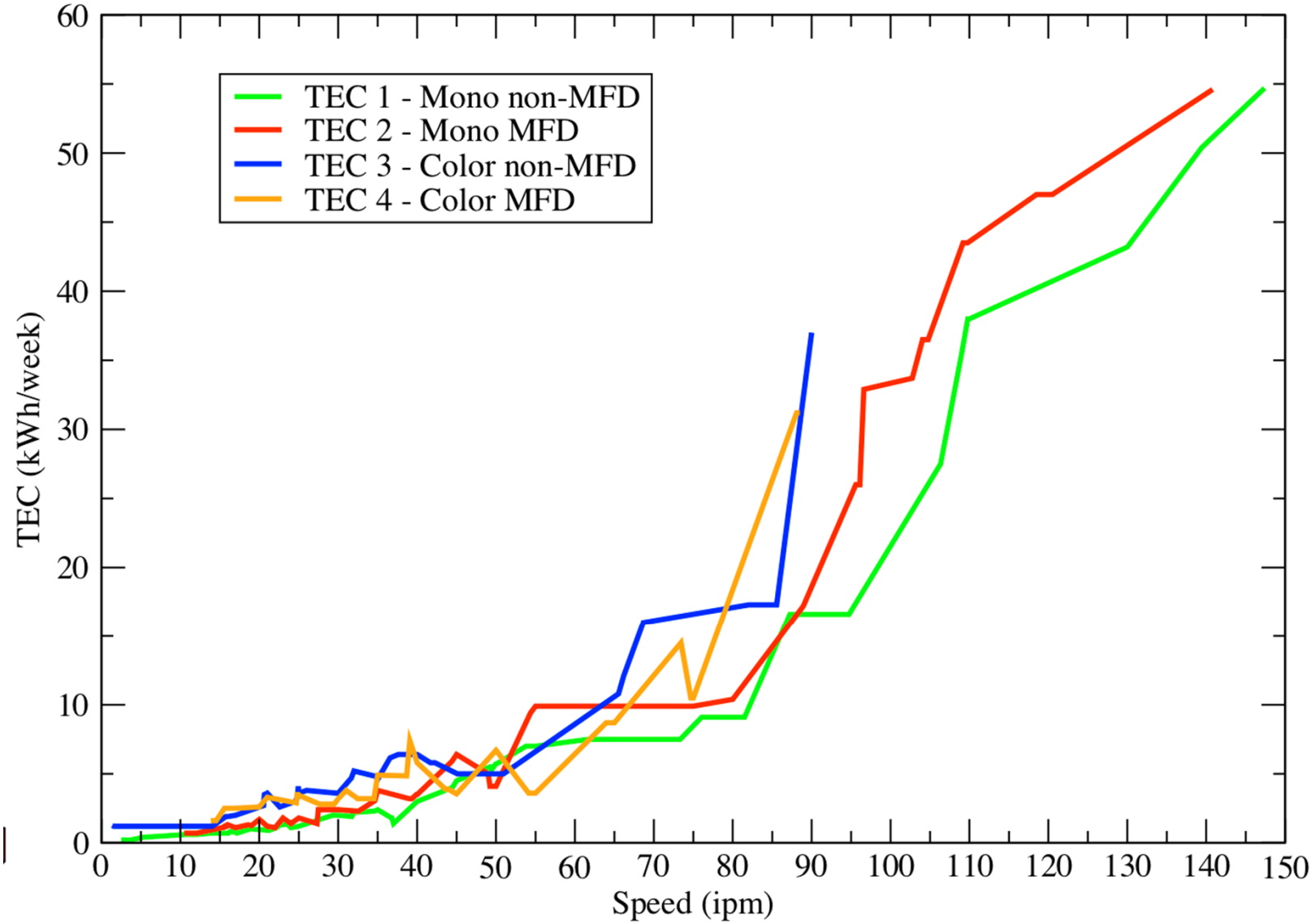


TEC – Mono Non-MFDs (3)



- "Moving window" – size shown here = 8
- For each speed, add speeds to right until window size reached or exceeded
- Take 25% line and calculate mean speed
- Repeat and connect dots
- Larger windows smooth line

TEC – Lines from v1.1 Grouping



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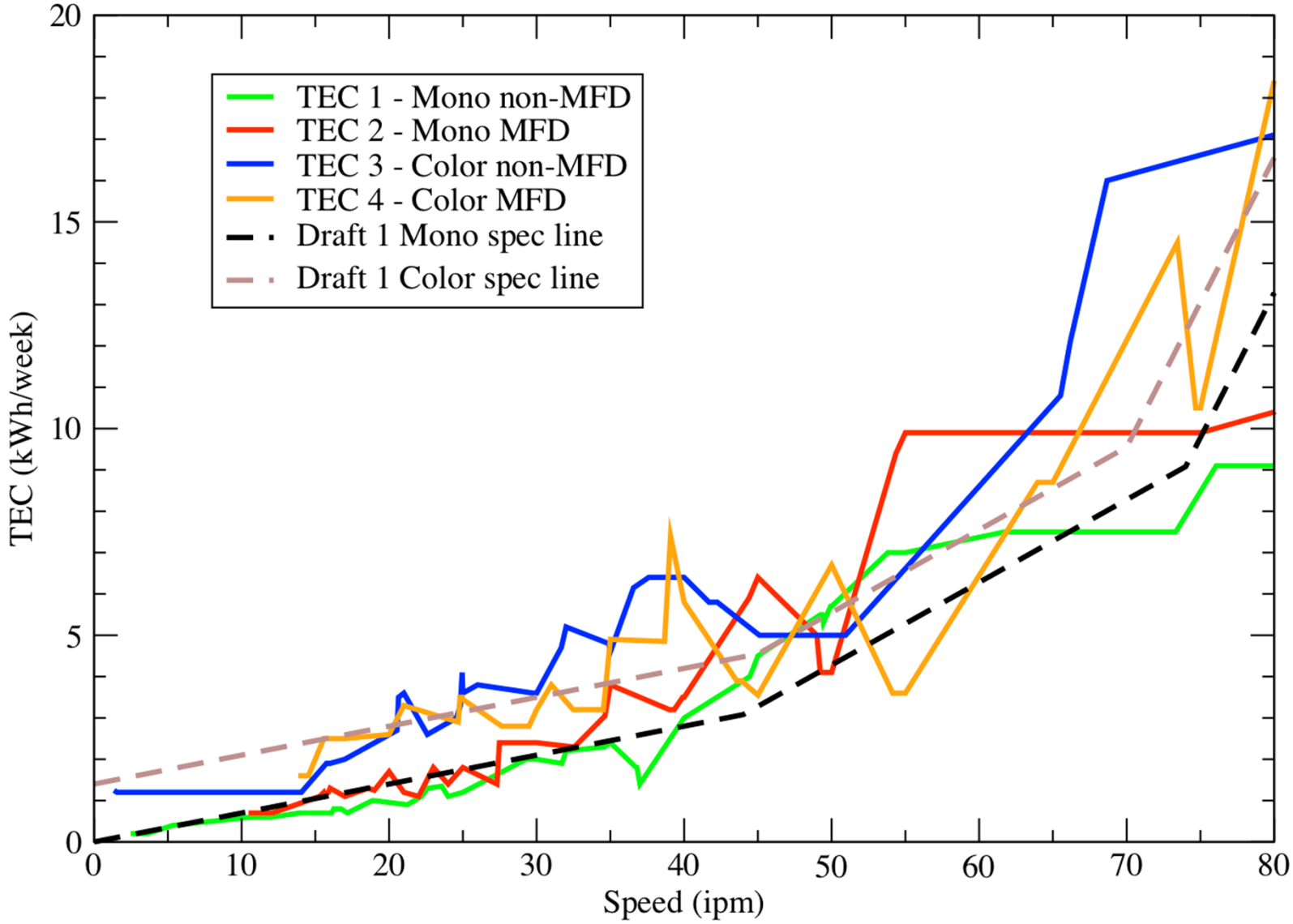
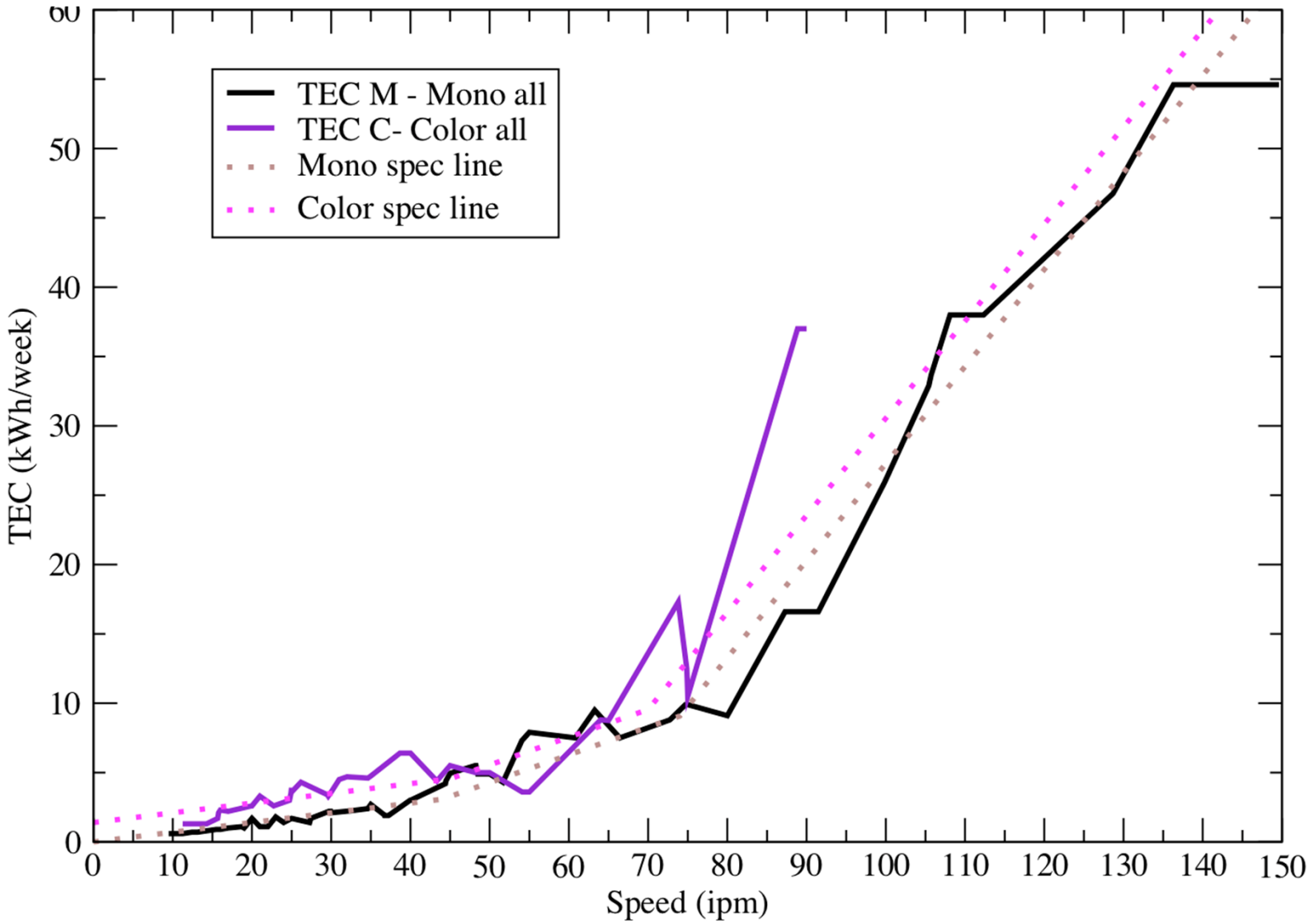
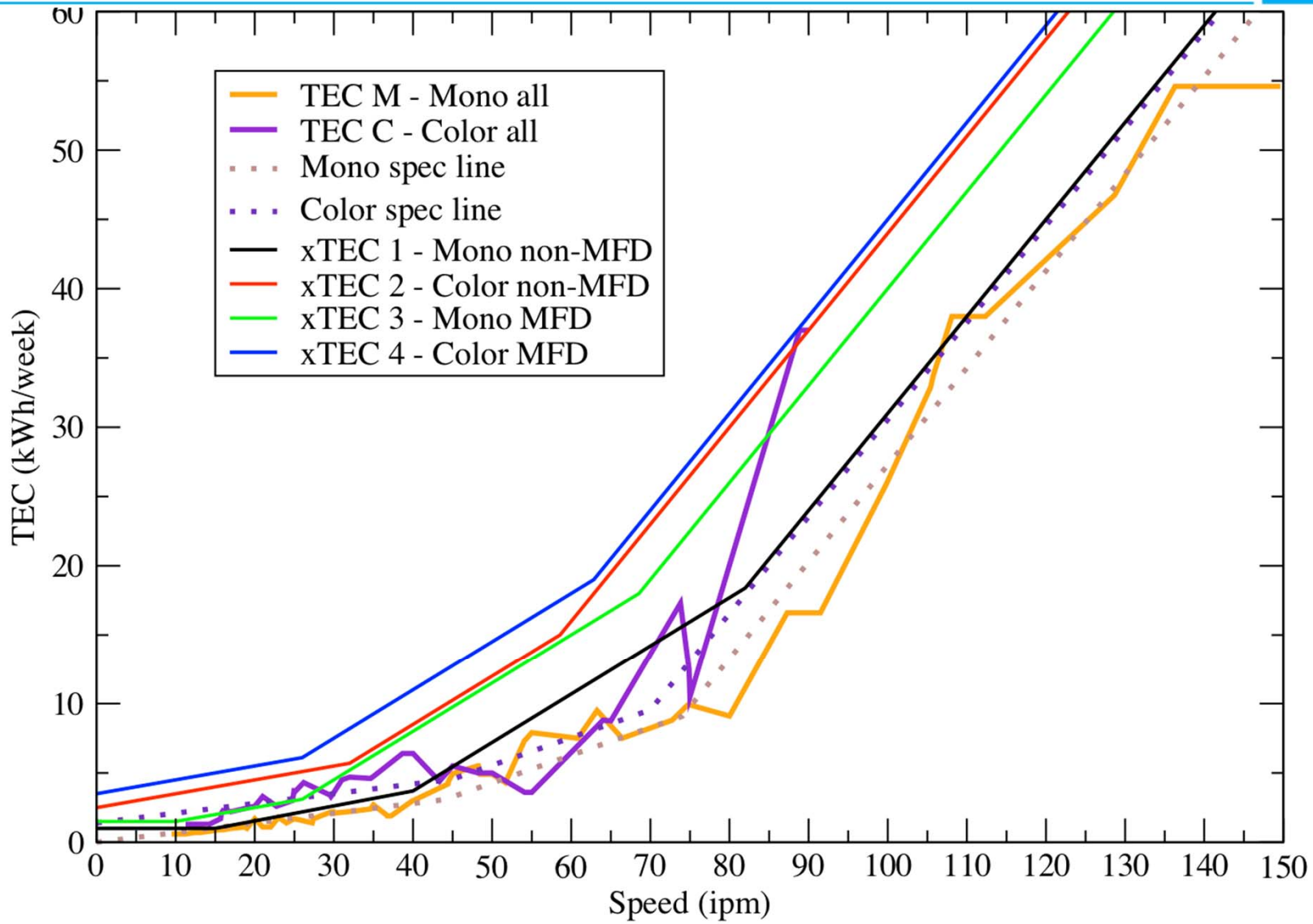


TEC - Color and Mono only



TEC – Comparison to v1.1 Levels



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Comments on the proposal

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Network Connections
&
Functional Adders

Network Connections

- Test Procedure has been modified to have only one active network connection at a time
- This will more accurately reflect real world usage where one connection is all that is active

Order of Preference for Use in Test (if Provided by UUT)	Connections for all Products
1	Ethernet – 1 Gb/s
2	Ethernet – 100/10 Mb/s
3	USB 3.x
4	USB 2.x
5	USB 1.x
6	RS232
7	IEEE 12841
8	Wi-Fi
9	Other Wired – in order of preference from highest to lowest speed
10	Other Wireless – in order of preference from highest to lowest speed
11	If none of the above, test with whatever connection is provided by the device (or none)

Network Connections (cont.)

- With this new test condition, EPA sees an opportunity to recognize and incentivize products that:
  - When not in use, connections should drop to a low power state
  - This is consistent with other ENERGY STAR specifications

Functional adders

- Current adders are the same since V1.0 went into effect (2006)
- July 8 memo proposed new allowances for primary adders and removal of secondary adders
- The base went up to compensate
- Draft 1 proposes to:
  - decrease or eliminate some adder allowances to reflect current state of technology
  - eliminate the concept of secondary adders
  - move some secondary adders to primary that should be active to continue receiving allowances (fax/phone)
- Fax + 1 Interface (if no fax, just +1 interface chosen from priority list)

Impact of Adders

- If the incentive should be to use less energy when not in use and less energy when performing a function, adders provide the wrong incentive all too often
- The incentive needs to be on providing savings under real world use
- 6 interfaces all active is not a typical use condition
- Industry provided data supporting this decision

Kept the following adders values

- Scanners – 0.5 W

Changed the following adders

- Memory
  - Decreased 1.0 watt/GB adder for memory to 0.5 watt/GB
- Data Connections
  - Wired <20 MHz: 0.3 to 0.2 W
  - Wired 20 – 500 MHZ: 0.5 to 0.4 W
  - Wired >500 MHz: 1.5 to 0.5 W
  - Flash: 0.5 to 0.2 W
  - Wireless RF (WiFi/Bluetooth): 3.0 to 2.0 W
  - Wireless Infrared: 0.2 to 0.1 W

Removed the following adders

- Product Control Panel Display
  - turned off for test of sleep mode therefore no need for allowance
- Power Supply
  - DOE has done testing to suggest newer designs have close low-load to no-load deltas
- PC Systems
  - actually a subtractor which assumed computer would manage printing etc – subjective application
- Internal Storage Drive
  - typically turned off in sleep

Impact on Qualification

- Both of these changes will impact the power consumption
  - changes in adders
  - test set up – network connection
- No new data has been forthcoming on the actual impact on models
  - Transformed data to set new levels
  - Unsure of impact on qualification rate
    - proposing levels higher than traditional 25% for OM – 30%
  - After lunch – discussion on process to set OM levels
- Changes are more likely to alter the base and not the adder values.

Comments on the proposal

- Adder removal will bias toward low feature systems
- Adder removal of power supplies biases against high power systems
- Proposed changes are too drastic and too extreme

- More comment responses in the coming weeks

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LUNCH

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Operational Mode (OM) Requirements

OM Requirements

- Cover: – Small and large format printers,
  - Impact and inkjet printers and MFDs,
  - Assorted other products (mailing machines, scanners)
- Sleep Mode requirement: base allowance dependent on product type, paper format, marking technology
  - Currently supplemented by primary functional adders (up to 3) which include interfaces active during the test
  - Secondary allowances are also added (unlimited number) to allow for varied functionalities: Interfaces not active during the test as well as non-interface functions (e.g., storage, memory, power supply, etc.)
- Standby requirement discussed in next section

Proposed Changes

Revise Adder Allowances to Be More Realistic	Revise Base Allowances to Highlight Most Efficient Models
• Revised test method allows only one interface to be connected (except fax) • Provide allowance for **only one** interface adder: the one used during test • Revise all adder allowances to reflect current state of technology	• The power of the base marking engine will appear to **increase** with lower adder allowances • Adjust the Base Allowance (OM Levels) to reflect this and maintain qualification of highly efficient products

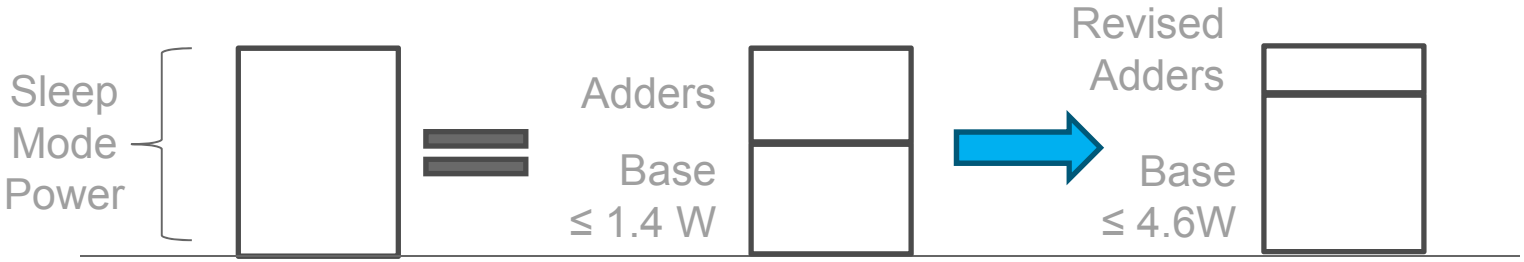
Transformation of OM Data

Sleep Mode power is constant → Changes to allowances will (appear to) increase the power of the base marking engine

- Increased the base allowance to compensate for the changes in adders
- Base levels set to ensure products qualify that:
  - Are energy efficient
  - Have the full range of features consumers are looking for

Example: OM 2

- Standard format ink jet printer/MFD/fax
- Version 1.X Sleep Mode
  Base Allowance: 1.4 W

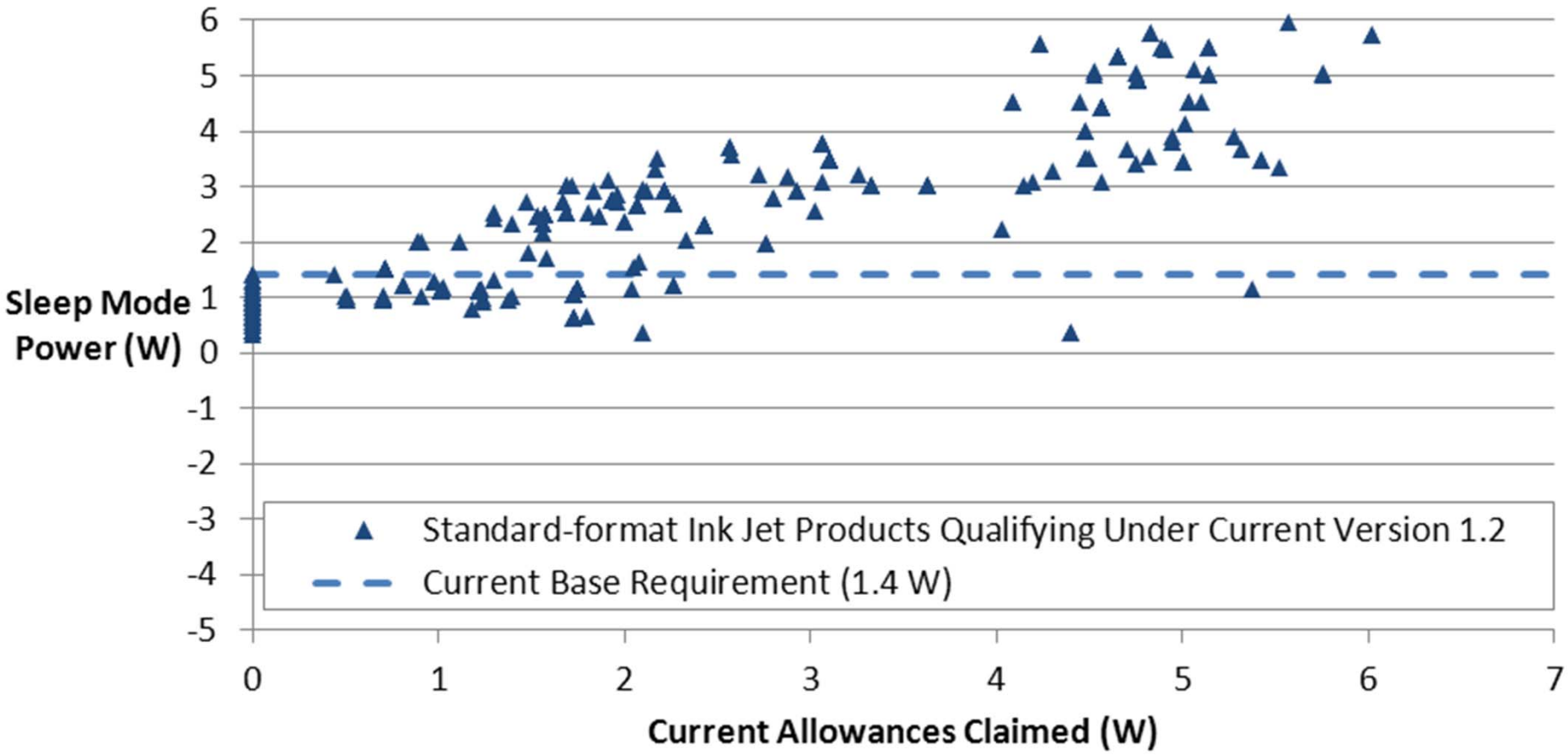


- 1.4 W base allowance would have to be increased to 4.6 W to compensate for revisions to adders
- Proposing to set qualification level at 0.6 W which should represent about 30% of products on market

Illustration of Process to Develop New Levels for OM 2

1. Subtract primary and secondary adder allowances: indicate allowances too large
2. Add revised adder allowances back in
3. Take into account that unused interfaces can be powered down when not in use
4. Set new base allowances to continue to qualify models have the full range of features consumers are looking for

1. Subtract Primary and Secondary Adder Allowances



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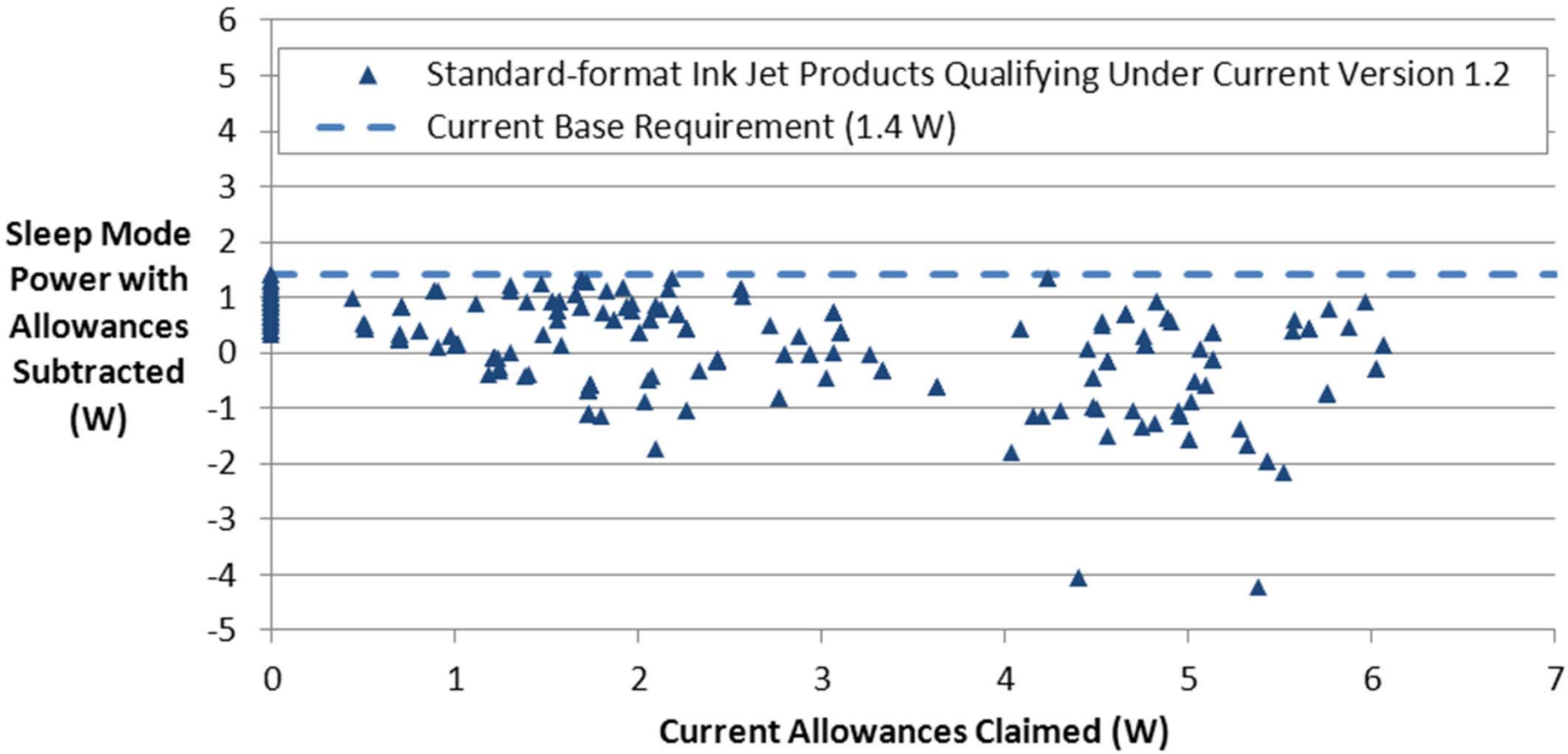

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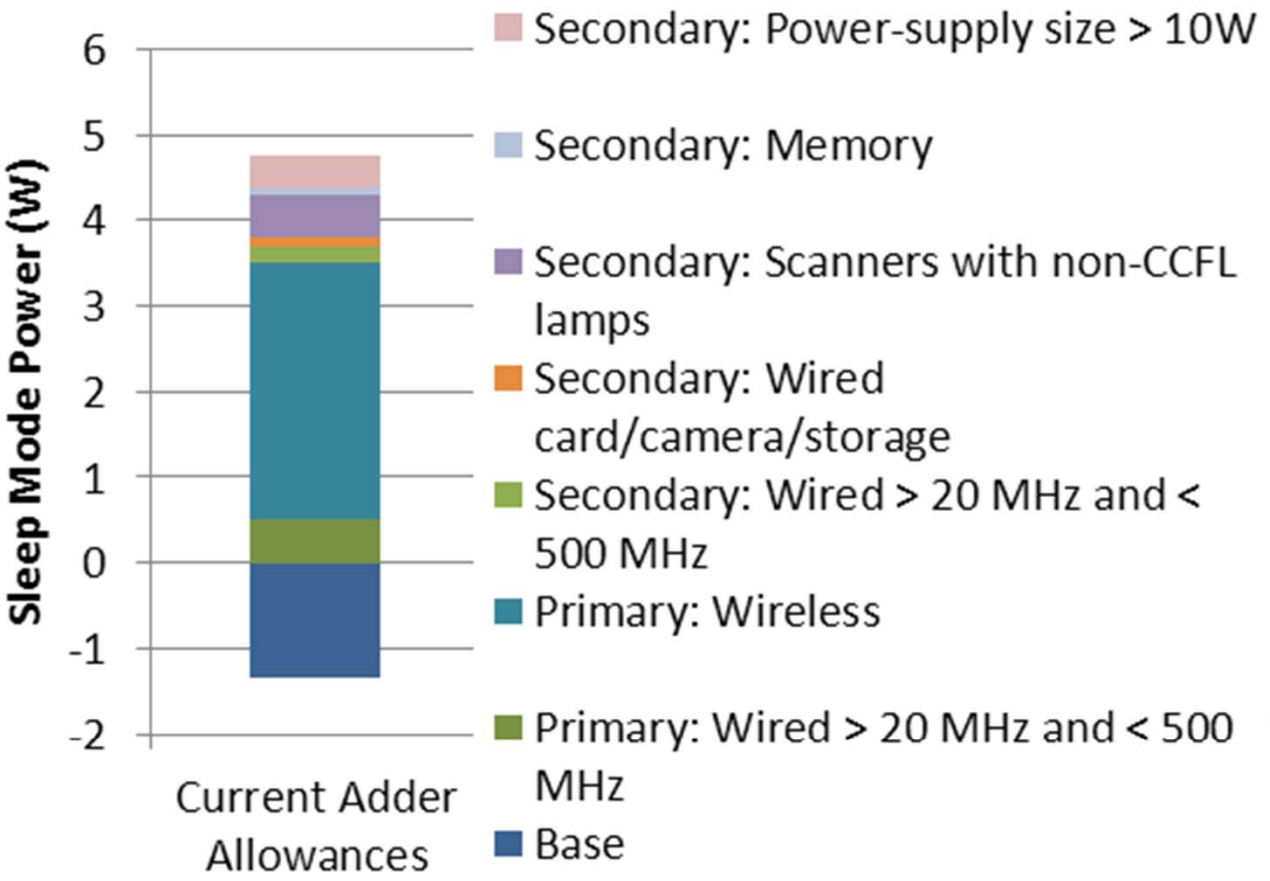
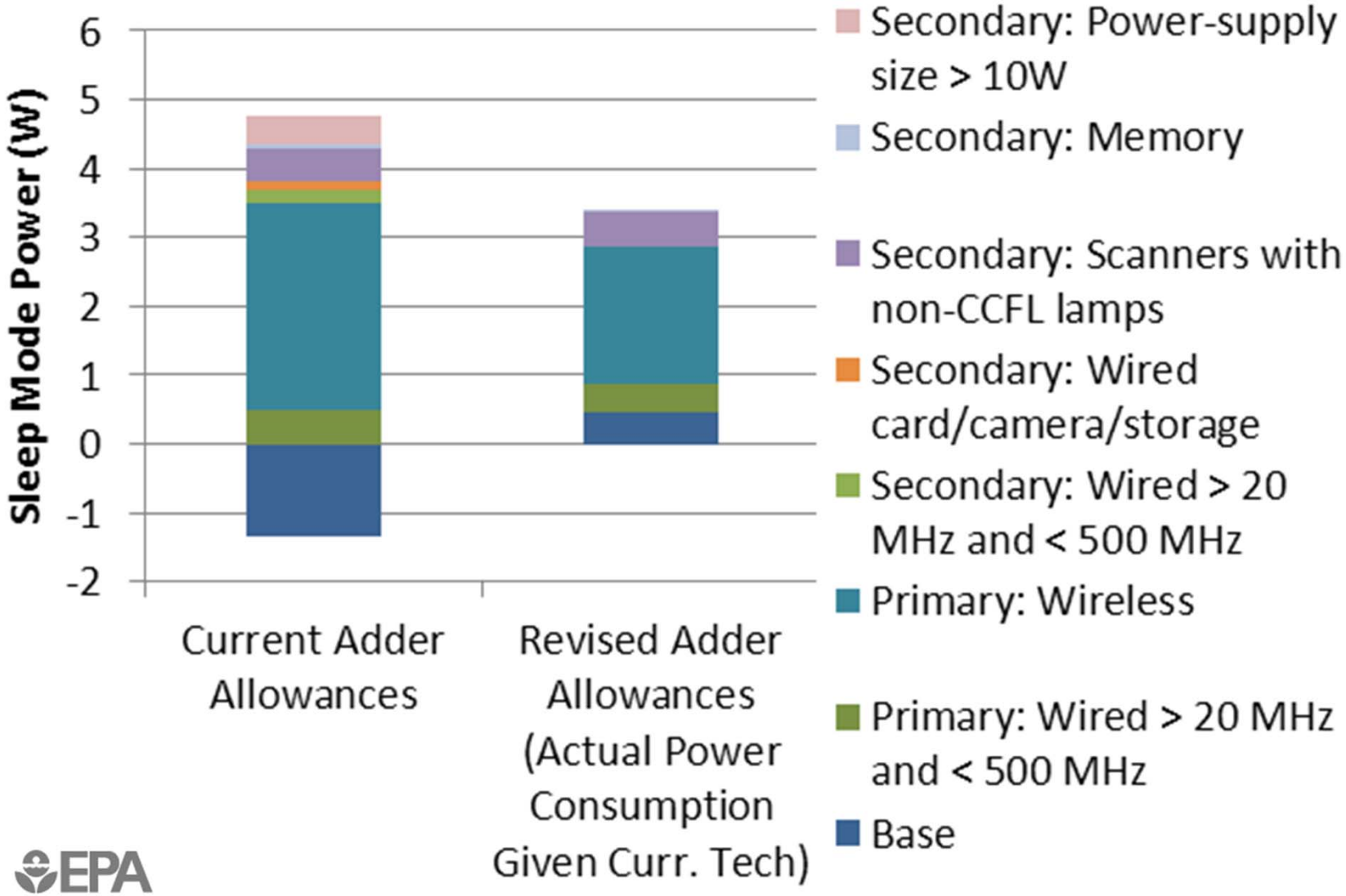
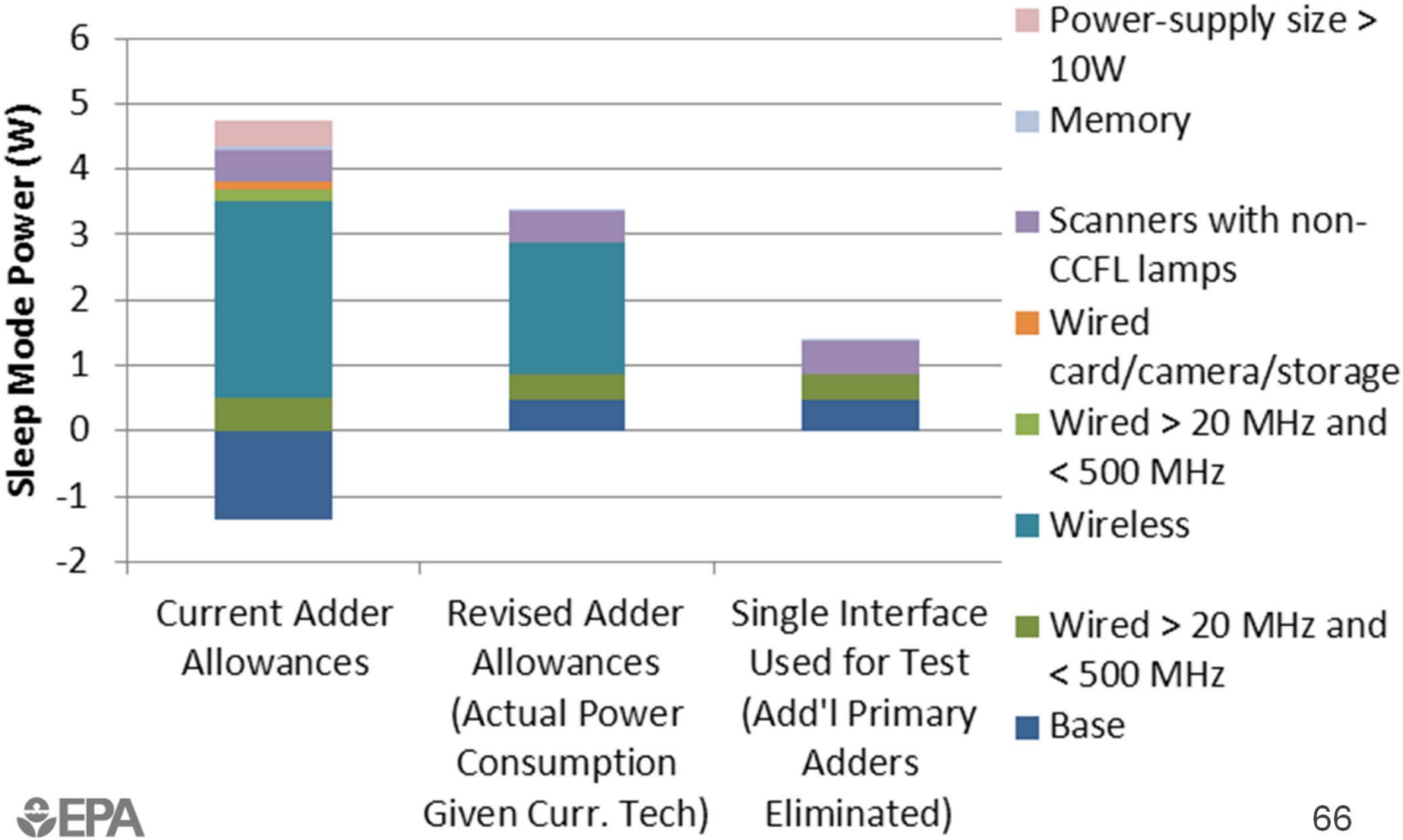


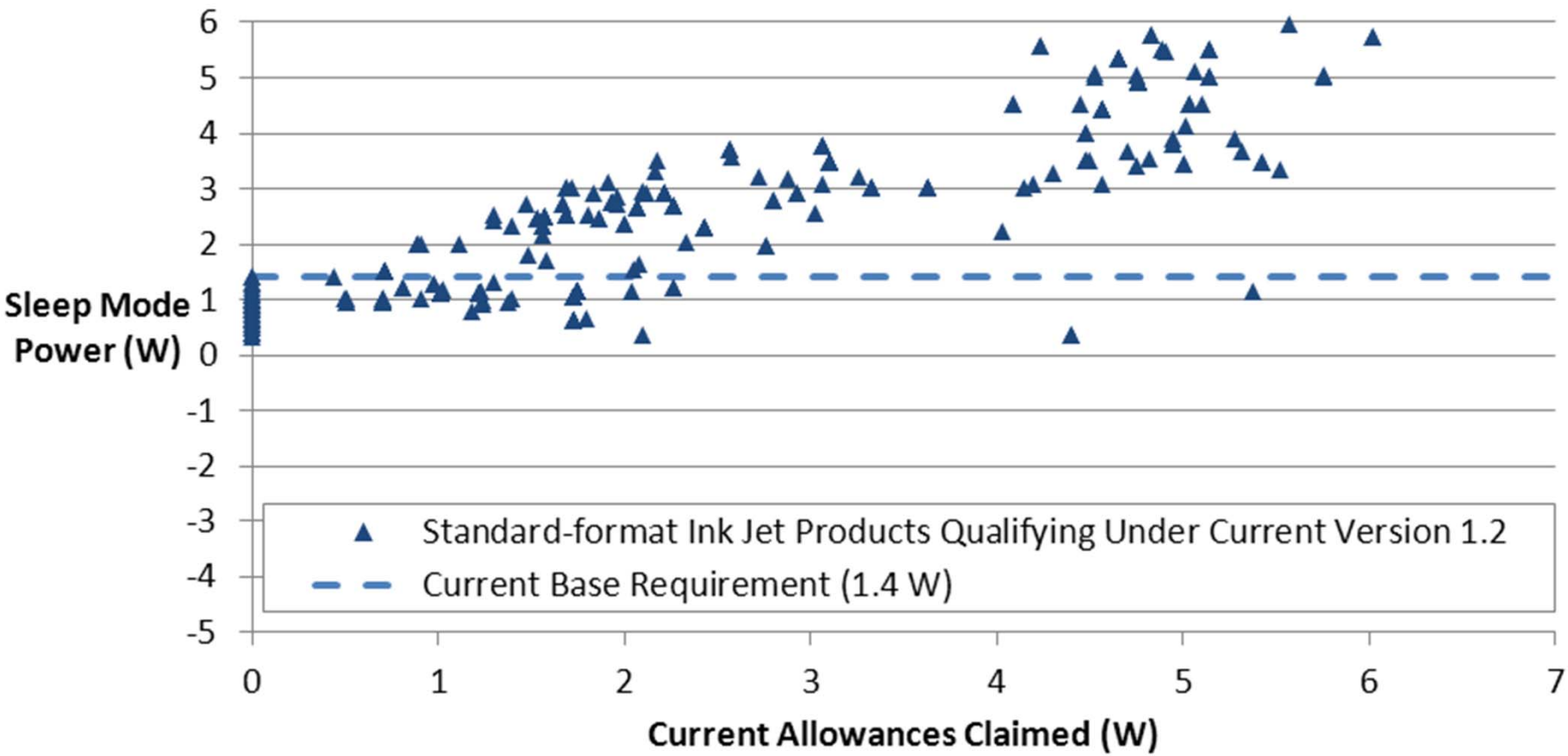
2. Add New Adder Allowances Back In



3. Power Down Unused Interfaces



4. Set New Base Allowances



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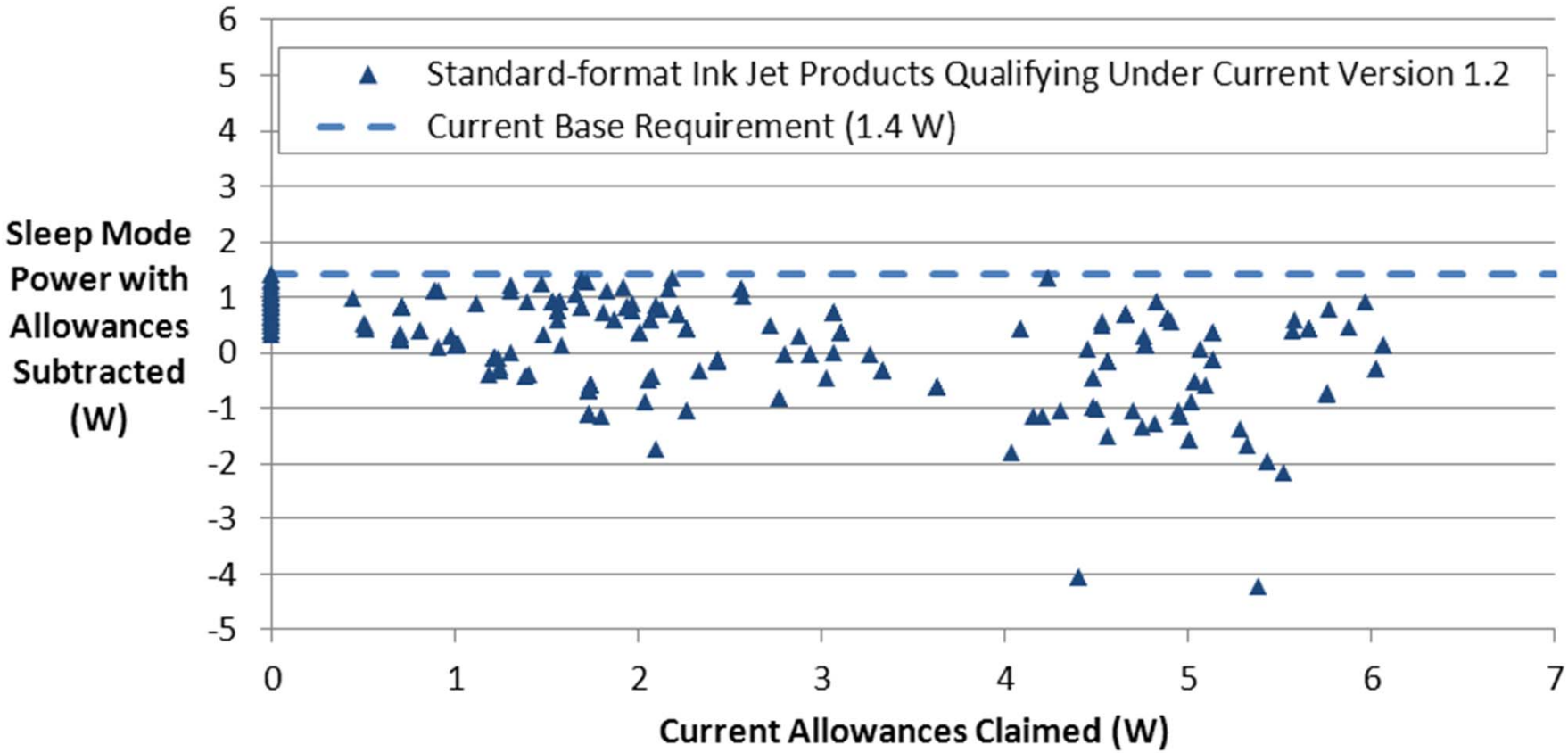
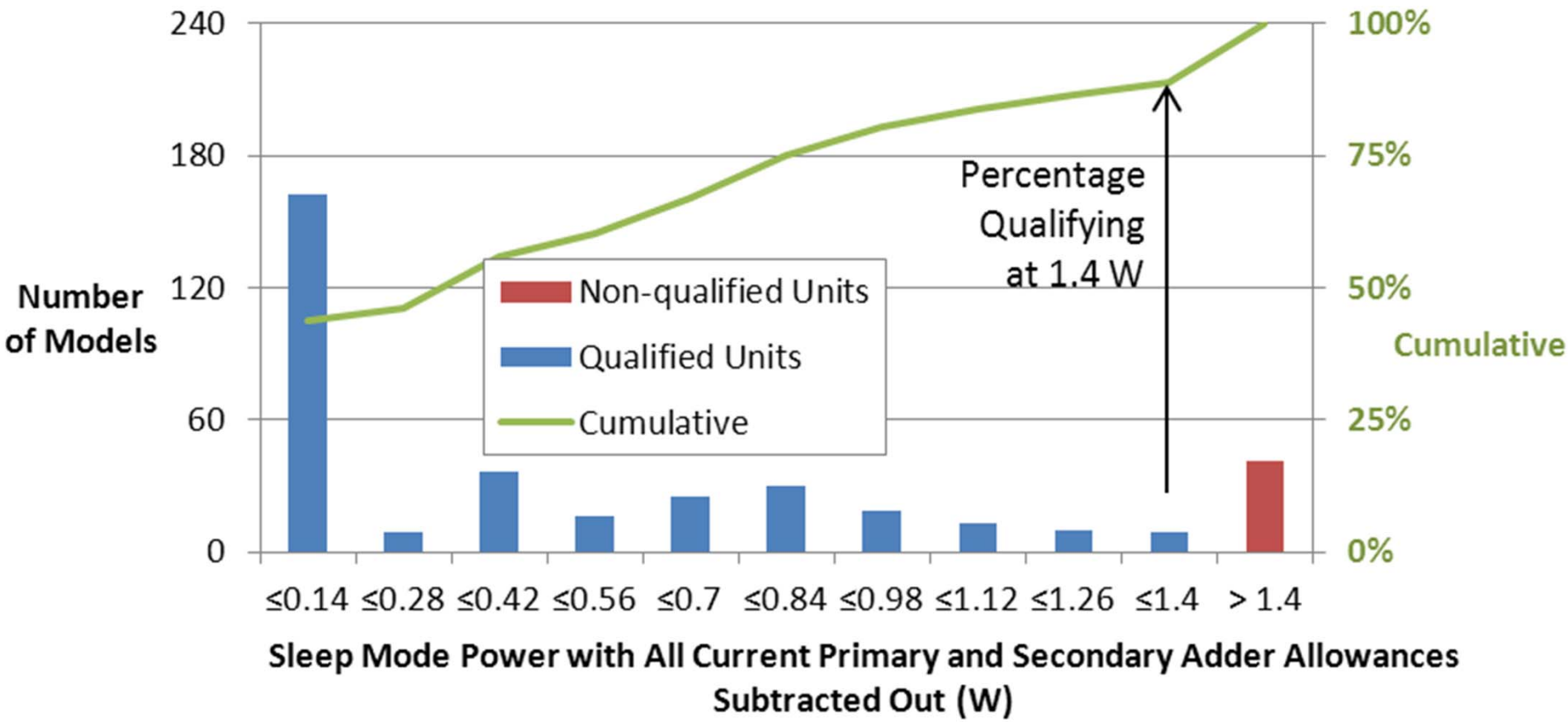
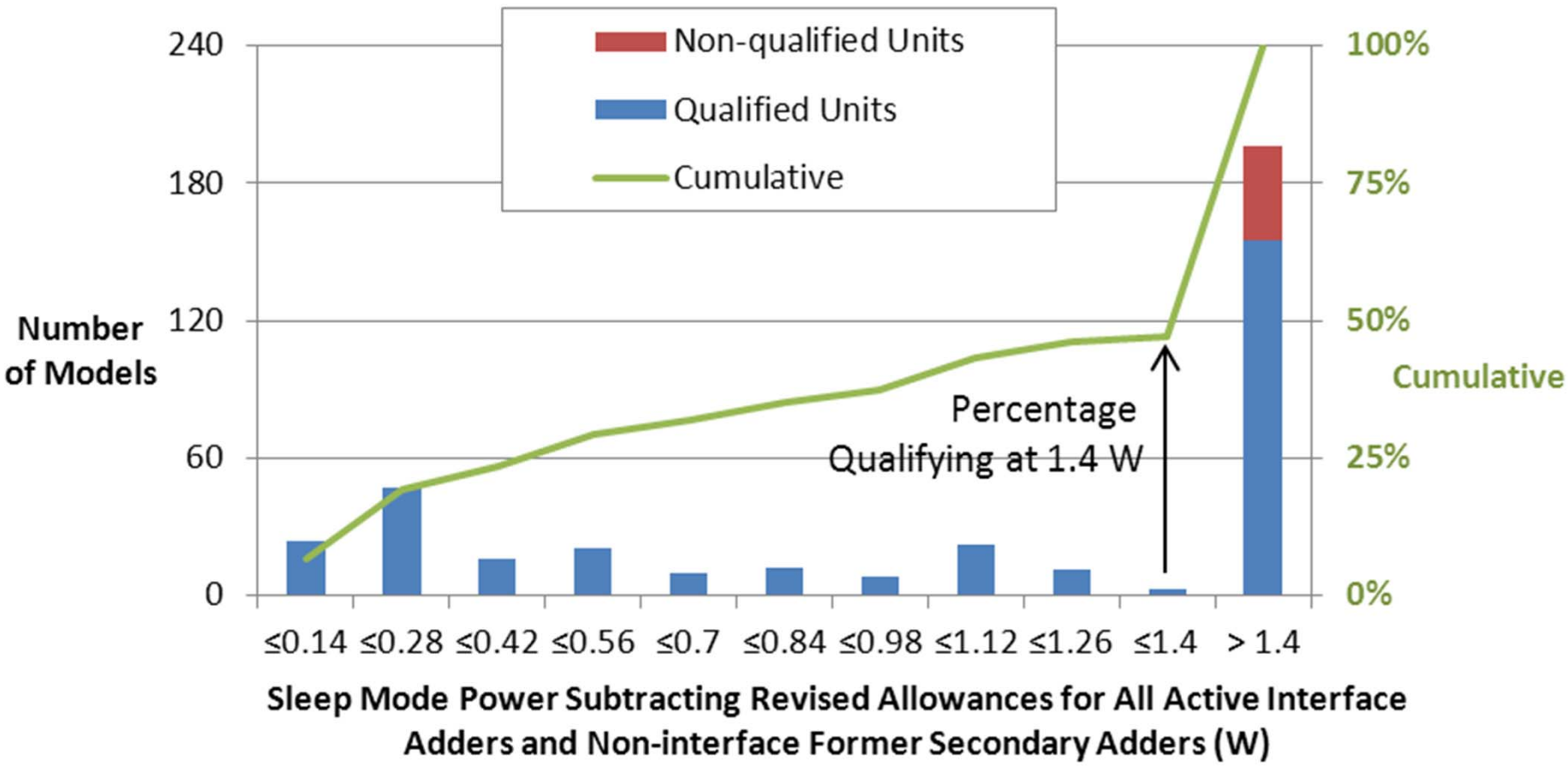


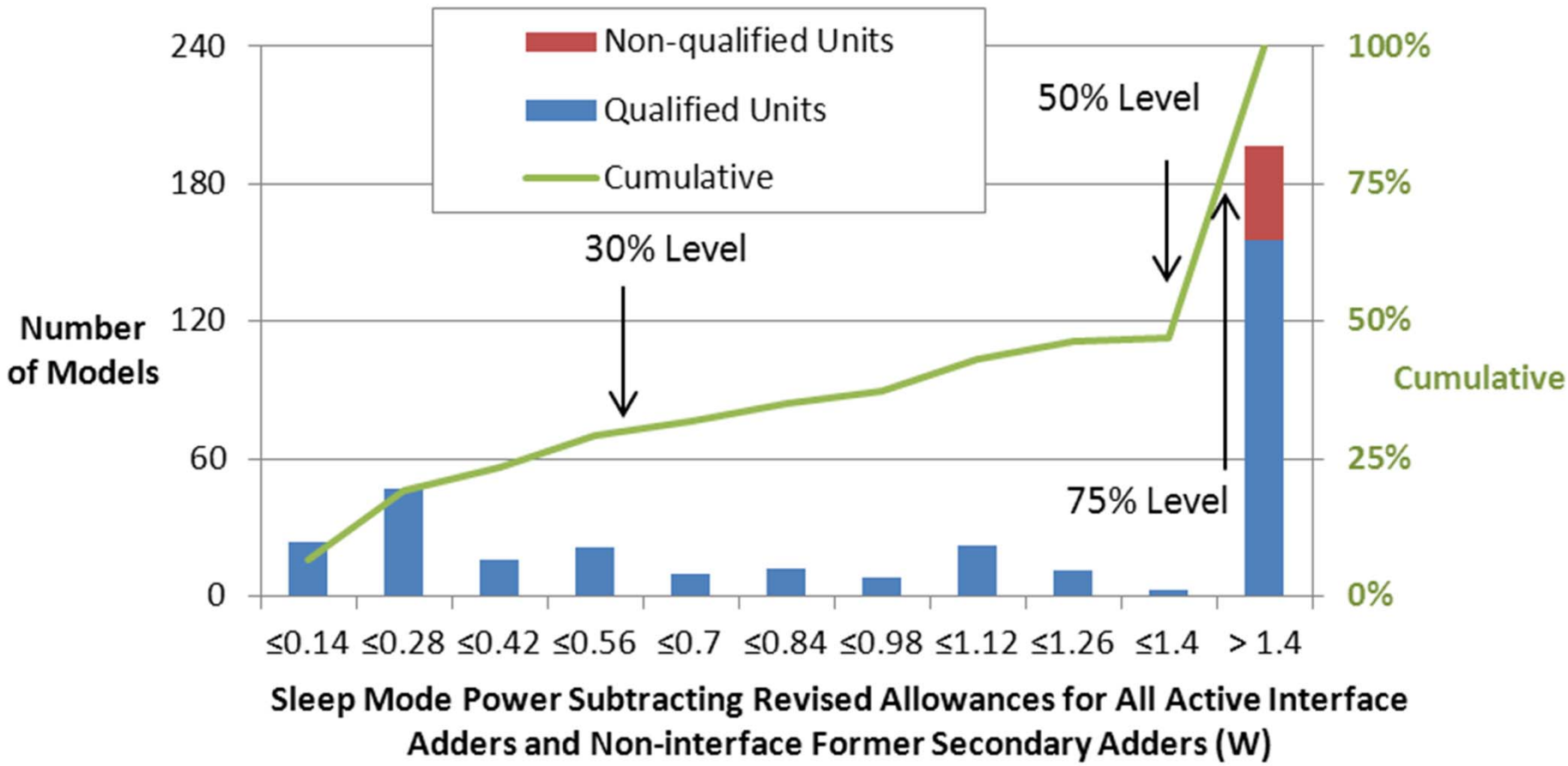
4. Set New Base Allowances (cont.)



4. Set New Base Allowances (cont.)



4. Set New Base Allowances (cont.)



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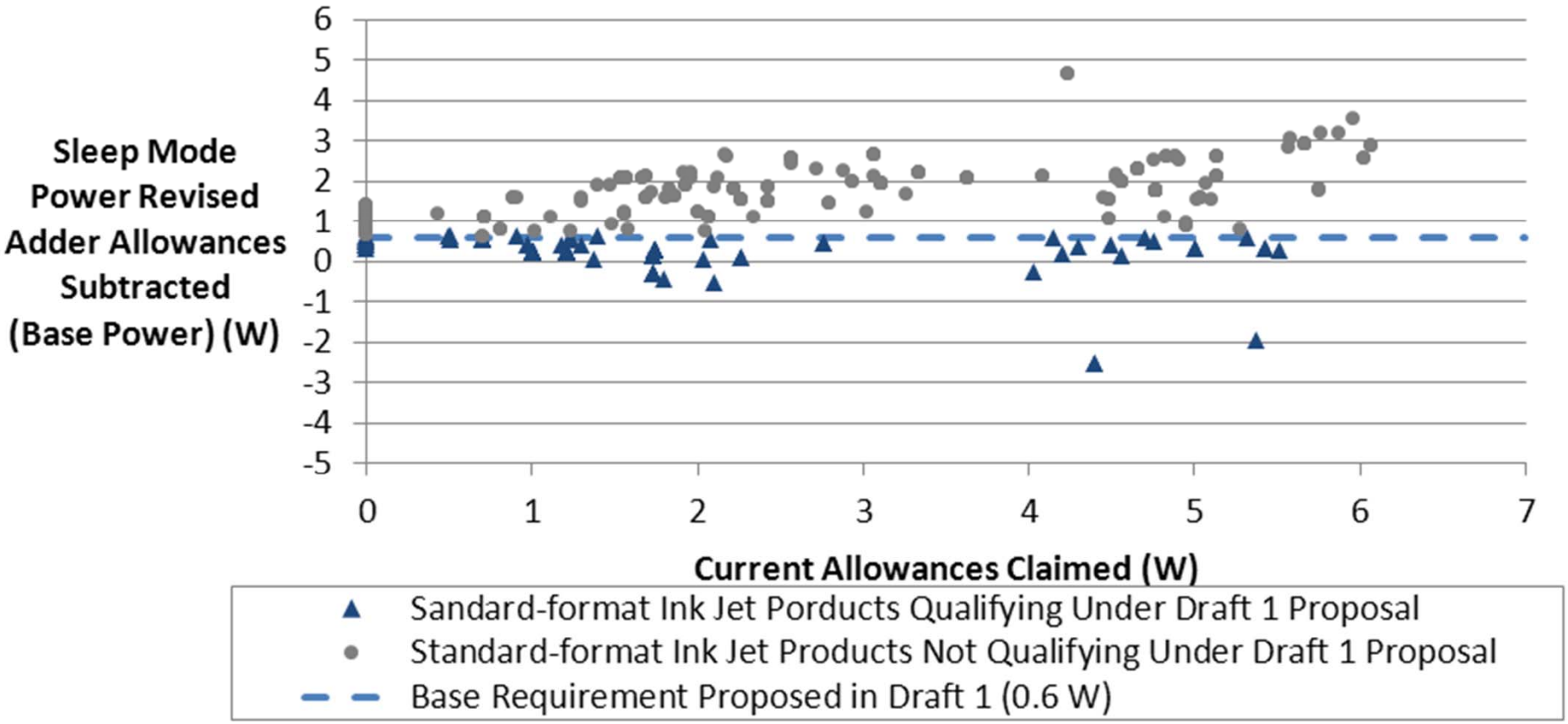

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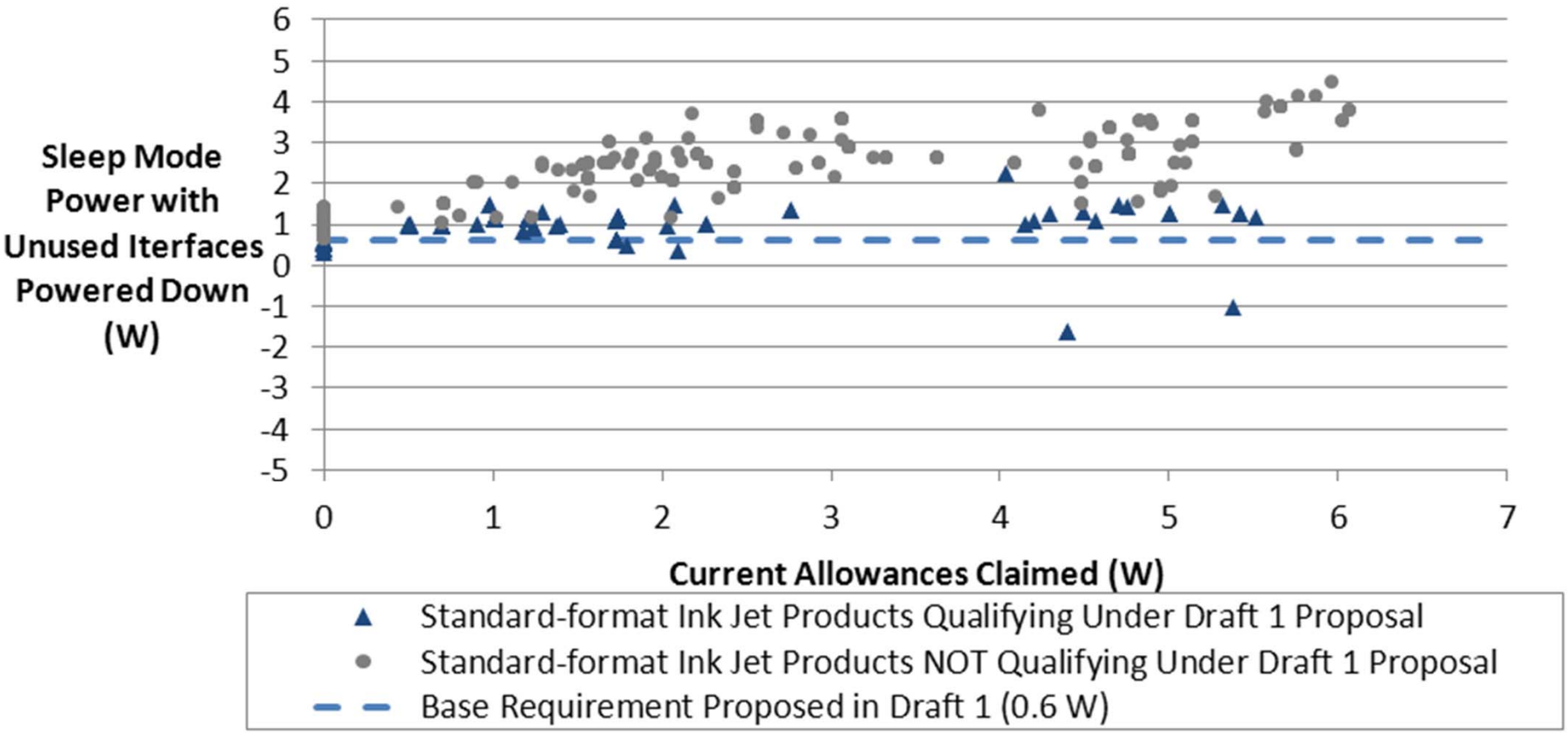
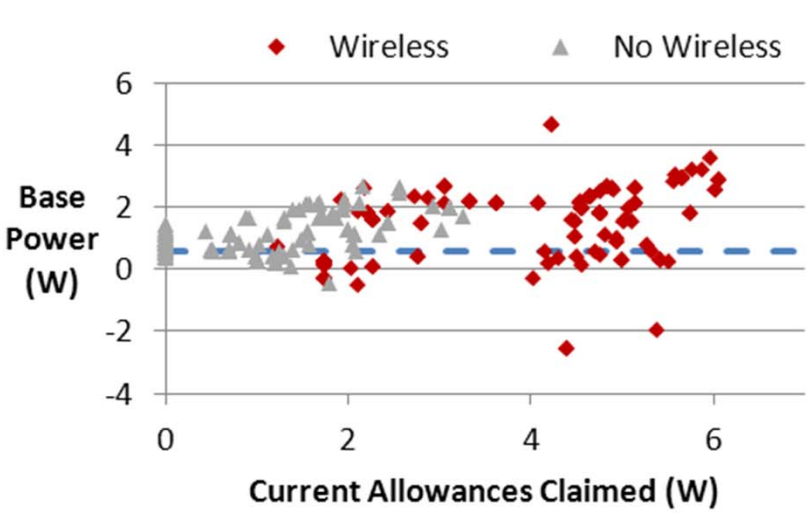
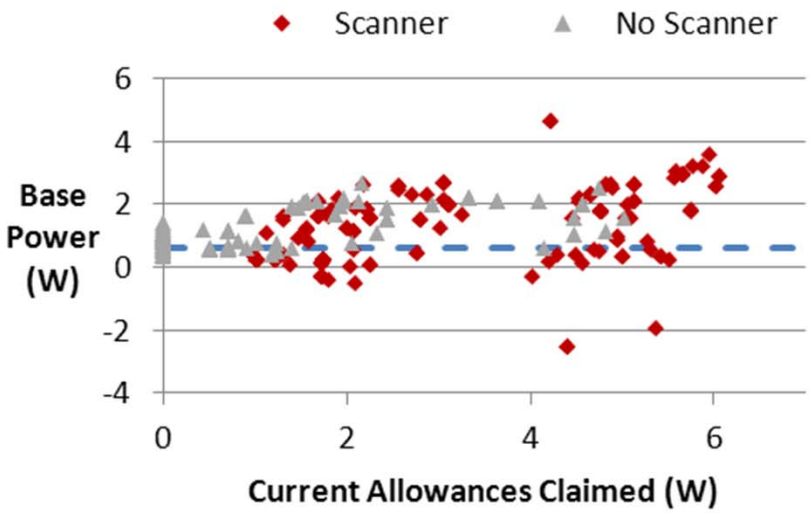
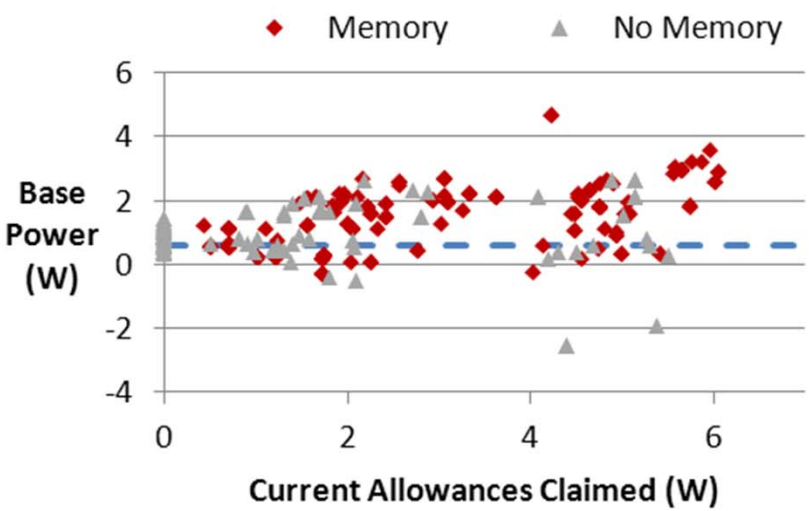
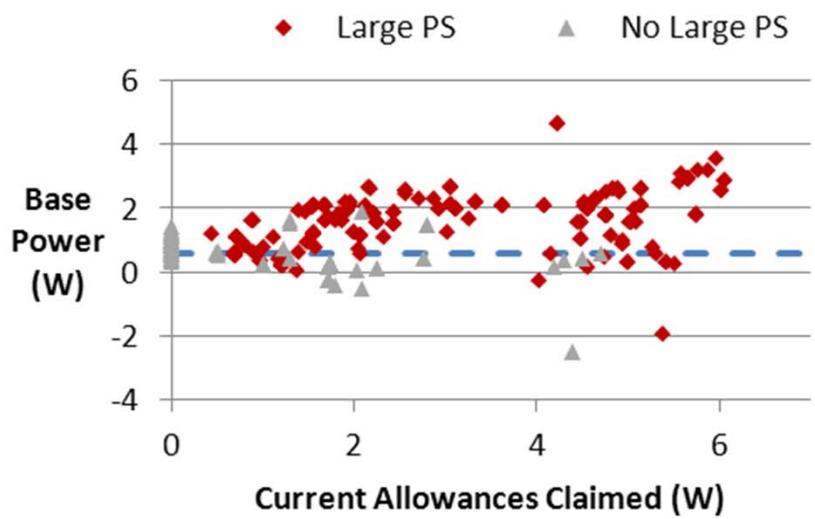


Impact on Higher Functionality Products









Proposed levels

OM	OM Category	Current Base Allowance (W)	%of Qualifying Models	**Proposed Base Allowance (W)**	%of Models Qualifying with Proposed Base Allowance
1	Large Non-ink Jet MFDs and Copiers	30	88%	**7.4**	30%
2	Standard Format IJ	1.4	89%	**0.6**	30%
3	Large Non-ink Jet Printers	14	82%	**2.5**	30%
4	Mailing Machines	7	41%	**5.6**	30%
5	Small Format Printers	9	13%	**9**	30%
6	Standard Format Impact Printers	4.6	60%	**2.3**	30%
7	Scanners	4.3	58%	**2.7**	30%
8	Large Ink Jet Printers and MFDs	15	87%	**4.9**	30%

Comments on the Proposal

- Base Allowances:
  - Proposed Base Allowances are much lower than Version 1
- Adder Allowances:
  - Proposed approach does not account for additional features (e.g., wireless)
  - Will favor simple, cheap products

Comments on the Proposal (cont.)

- Specific Adder Allowances:
  - Order of interfaces does not reflect typical use
  - Larger power supplies may have larger sleep mode requirements
  - No adder for touch panel capacitive sensors
  - Insufficient adder for cordless phone
  - Memory allowance should scale with GB
  - Partners should not test fax or decide whether to test fax and substitute another network interface if not
  - Unclear whether scanners should receive scanner-lamp adder allowances

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Standby and Wakeup

Standby

- Propose reducing max standby for OM from 1.0W to 0.5W
  - Align with forthcoming EU Ecodesign ErP legislation requiring this level by 1/1/13
  - 89% of the currently qualified products can meet 0.5W limit

OM category	Meet 0.5 W	%
OM 1 – Large Format copier/MFD	11/29	38%
OM 2 – Standard IJ Fax/MFD/Printer	283/329	86%
OM 3 – Large Format IJ Pinter/MFD	88/112	79%
OM 4 – Mailing Machines		
OM 5 – Small Format Printers	55/55	100%
OM 6 – Impact Printers	68/68	100%
OM 7 – Scanners	248/251	99%
OM 8 – Large Format Printers	9/11	82%

Comments on the proposal

- Request to update the test method for scanners connected to a PC via USB to do so in conjunction with the connected PC
- On a slightly related note
  - Request to reinstitute the language that end user can adjust default delay time within the permitted maximum limit

Wakeup

- Proposed Requirement
  - Unit under test shall not wake for common network traffic
    - unless the traffic is designated for the unit to perform a user requested service. Common traffic including should not wake the device.
- Intent was to ensure qualified products will use power management features "out of the box", saving energy, without requiring special configuration

Comments on Wake

- Need a clearer definition for “Wake up” and a test procedure to measure it
- Need a definition of “common network traffic”
- Since testing in “as shipped configuration” should capture any higher power usage of these undesirable wake up events

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Digital Front End

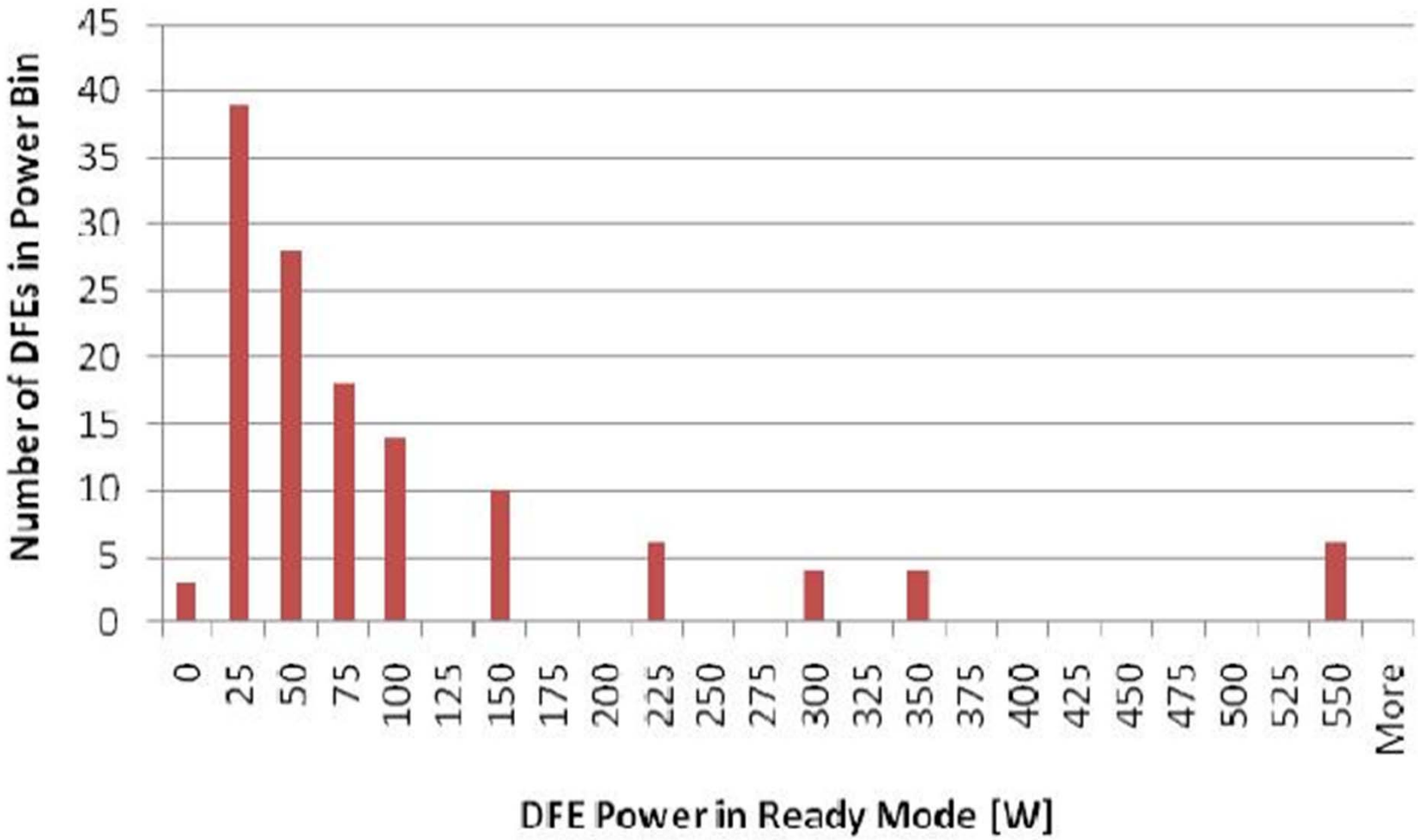
DFE Definitions

- Type 1 DFE: A DFE that draws its dc power from its own ac power supply (internal or external), which is separate from the power supply that powers the Imaging Equipment.
- Type 2 DFE: A DFE that draws its dc power from the same power supply as the Imaging Equipment with which it operates. Type 2 DFEs must have a board or assembly with a separate processing unit that is capable of initiating activity over the network and can be physically removed, isolated, or disabled
- Type 3 DFE: A DFE that is not shipped with the Imaging Equipment it supports. This DFE draws its dc power from its own external ac power supply, which is separate from the power supply that powers the Imaging Equipment. No requirements shall apply to Type 3 DFEs.

Digital Front End

- V1.1 requires
  - Type 1 DFE (DFE with its own power supply) to meet the Digital Front End Power Supply Efficiency Requirements
  - Type 2 DFE (uses power supply from imaging equipment) subtract the DFE's energy consumption in Ready mode
- V2 Draft 1 proposes to create ready mode power requirements for both types and eliminate power supply requirements.

Digital Front End (DFE) Energy Consumption



DFE – V2.0 Proposals

1. Promote DFE qualification as a server or small-scale server, as defined in the ENERGY STAR Servers and Computers specifications, respectively;
2. Treat DFEs as functional adders;
3. Incentivize or require a Sleep Mode for DFEs (with a power limit and maintenance of full network connectivity) when Imaging Equipment is in Sleep Mode; and/or
4. Consider the DFE an integral component of the Imaging Equipment and record the DFE power measured through the test method.

DFE – V2.0 Approach

- Add a 10 minute energy measurement of the DFE input power while Imaging Equipment is in sleep mode.
- Combine parts of options 1 and 3 from the previous slide, creating ready mode power requirements for all DFEs and incentives to promote network capable sleep mode.
- Treatment of DFEs in OM and TEC power calculations remains unchanged from Version 1.2.

Type 1 DFE

- Propose using small-scale server power consumption requirements from the Version 5.2 Computer Spec:
  - Max idle power requirement
    - 50 W for a single processing core
    - 65 W for multiple processing cores.
- Proposing eliminating DFE power supply efficiency requirements to allow more flexibility in how to meet this maximum power requirement.

Type 2 DFE

- Proposing to use 85% of the Ready Mode maximum power requirement for Type 1 DFEs.
  - Max idle power requirement
    - 42.5 W for a single processing core
    - 55 W for multiple processing cores.
- Proposing eliminating DFE power supply efficiency requirements to allow more flexibility in how to meet this maximum power requirement.
- Treating both types the same.

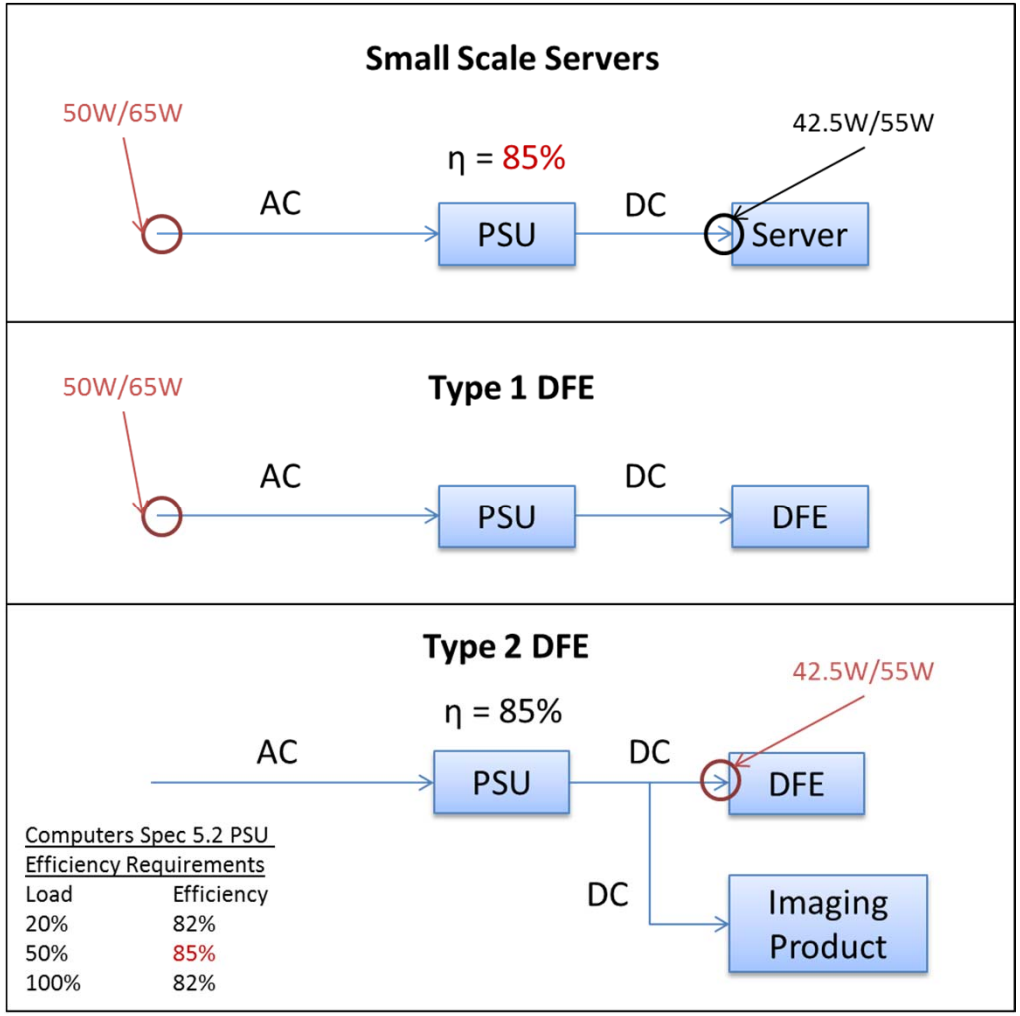
Ready Mode Power Requirements

Table 2: Maximum Ready Mode Power Requirement for Type 1 and Type 2 DFEs

DFE Category	Category Description (From Small-Scale Servers)	Maximum Ready Mode Power (W)	
		Type 1 DFE	Type 2 DFE
A	All DFEs that do meet the definition of Category B will be considered under Category A for ENERGY STAR qualification.	50	42.5
B	To qualify under Category B DFEs must have: Processor(s) with greater than 1 physical core or greater than 1 discrete processor; and Minimum of 1 gigabyte of system memory.	65	55

- DFEs and small-scale servers share similar hardware components.

Ready Mode Power Requirements



Network Capable Sleep Mode

- Significant gains in efficiency possible.
- EPA welcomes stakeholder input on ways to incentivize and accelerate the adoption of ProxZzzy like protocols in DFE technology for Version 2.0 specification.

Summary of DFE Discussions

- Conference calls were held with all interested stakeholders on 2/27 and 3/5.
- Type 3 DFE definition.
- Testing procedure for Type 2 DFEs.
  - Challenge to disassemble and measure dc input power of Type 2 DFEs.
- Market and technical barriers preventing ProxZzzy like protocol adoption for network capable sleep mode.

Comments on the proposal

- Type 3 DFE definition.
- Testing procedure and ready mode power requirements for Type 2 DFEs.
- How to avoid penalizing systems that make use of DFE sleep mode but have higher Ready Mode power levels.
- How to address higher consumption DFEs that provide more functionality.

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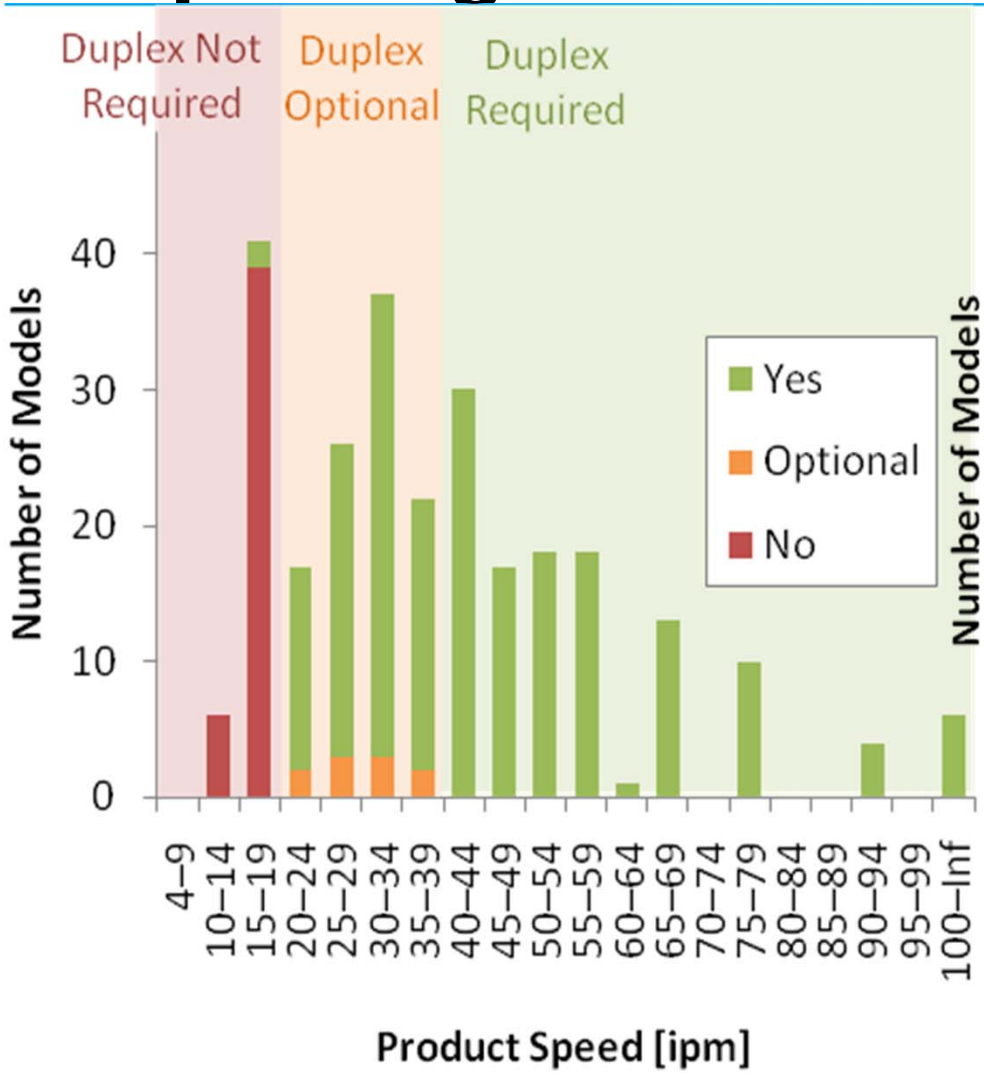
Automatic Duplexing

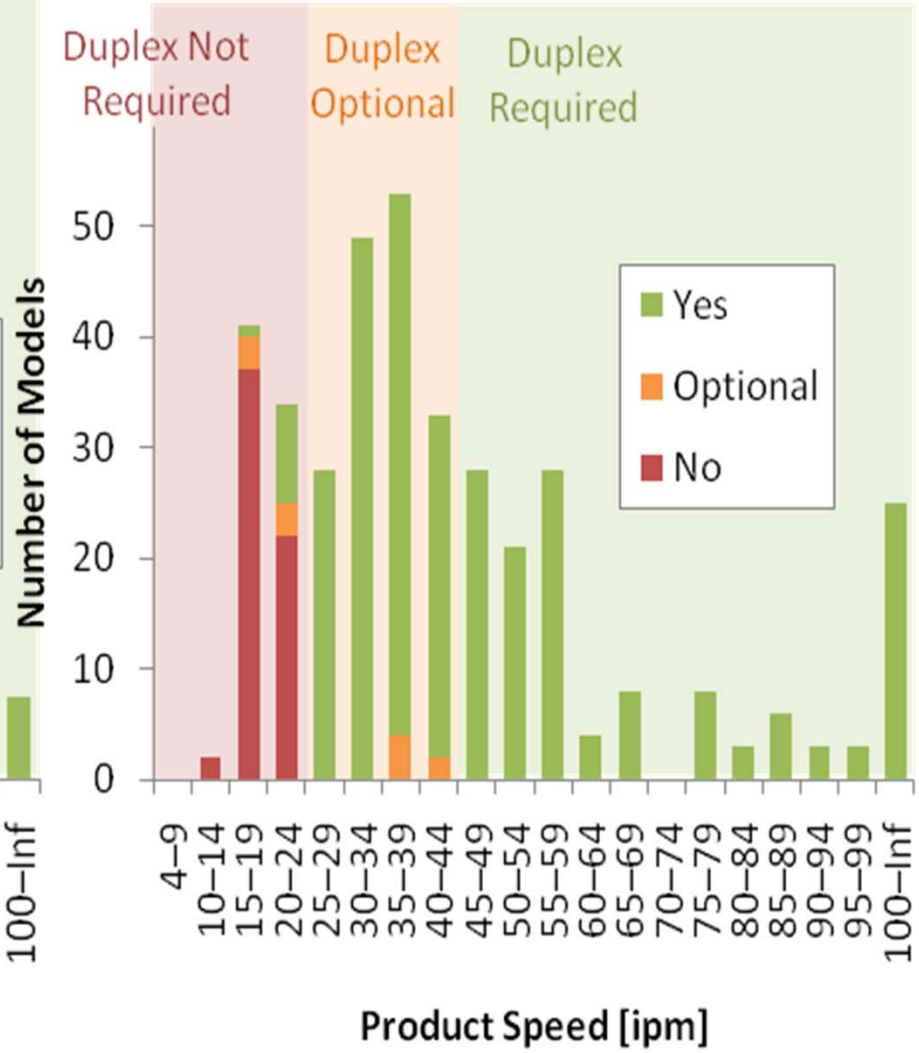
Automatic Duplexing

- Requirements in place since 2006
- Currently allow for different speeds and color capabilities differences for requiring duplexing integral to base and as an optional accessory
- Data analysis shows there is no sizable difference between monochrome and color for adopting duplexing
- Identified in V1.1 that this was an issue that EPA intended to reassess in the next iteration
- Greater implementation of duplexing would potentially result in reduced paper usage, which in turn has huge environmental benefits

Prevalence of Automatic Duplexing



Monochrome



Color

Automatic Duplexing Proposal

Propose combining auto duplexing requirements for mono and color

Remove optional allowance and require duplexing for all products above 19 ipm

Version 1.2	
Monochrome Speed (ipm)	Requirement
Color	
S ≤ 19	None
19 < S < 40	Optional
S ≥ 40	Integral
Monochrome	
S ≤ 24	None
24 < S < 45	Optional
S ≥ 45	Integral

Proposed Draft 1	
Monochrome Speed (ipm)	Requirement
S ≤ 19	None
S ≥ 19	Integral to base

Comments on the proposal

- Many comments on price sensitivity of consumers for additional functionality
- Several comments on change requirements to impact of design and time to market

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Toxicity and Recyclability Requirements

Powering Intelligent Electricity Use

- Key consumer purchasing factors:
  - price (95%)
  - product features (88%)
  - environmental factors
    - energy consumption (85%)
    - ability to recycle a device (70%)
- 64% of adults look for energy efficient electronics
- Source: Consumer Electronics Association, "Powering Intelligent Electricity Use", 2011

Non-Energy requirements

- ENERGY STAR continues to differentiate products based on energy efficiency only.
- Many ENERGY STAR existing product specifications incorporate non-energy requirements – health, safety, etc. This reflects longstanding practice of ensuring that ENERGY STAR products deliver on consumer expectation for quality.
- In developing these requirements, EPA seeks to avoid associating the ENERGY STAR label with poor-quality or otherwise undesirable products.
- EPA drew from existing standards/effort for toxicity and design for recyclability.

Non-Energy requirements

- Non-energy requirements are :
  - exempt from third-party certification process.
  - not intended for international adoption and that when products are sold in countries other than US, they are not subject to proposed non-energy requirements.
  - exemptions for toxicity to harmonize with RoHS Directive where applicable to Imaging Equipment

- EPA seeks feedback on whether additional exemptions apply to Imaging equipment

Comments on the proposal

- Many comments on the listed ROHS exemptions
  - EPA intends to cover the same exemptions as the EU WEEE and will update accordingly
- Many comments opposed the inclusion of non functional performance attributes
- Many comments on the role of CBs with this criteria
- Many comments on the impact on the ENERGY STAR brand

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Timeline

Draft 1	Feb 8 2012
Comments due	Feb 29 2012
Meet in Washington DC	March 7 2012
Draft 2	March 28 2012
Comments due	April 18 2012
Final draft	May 9 2012
Comments due	May 23 2012
Final	June 4 2012
Effective *	March 1 2013

* assuming no extensive pushback on the adders and levels

Comments on Timeline

- Comments requested extending effective date – 1 , 2 , up to 5 years
- Several comments to allow grandfathering to V1.2
- Impact due to third party certification and changed test method requires all products to be tested – question CBs ability to meet demand

Summary

Wrap Up

Follow up items

- TBD

Contact Information

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

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