ENERGY STAR®

ENERGY STAR Computers Version 8.0 Discussion Guide

February 11, 2019

Webinar Agenda

1. Introductions and Recap of ENERGY STAR Process
2. Categorization Systems
3. Mode Weightings
4. Treatment of non-traditional SSD Options
5. Internal Power Supplies
6. Resume Time to Sleep
7. Scope Revisions
8. Conclusions

Introductions

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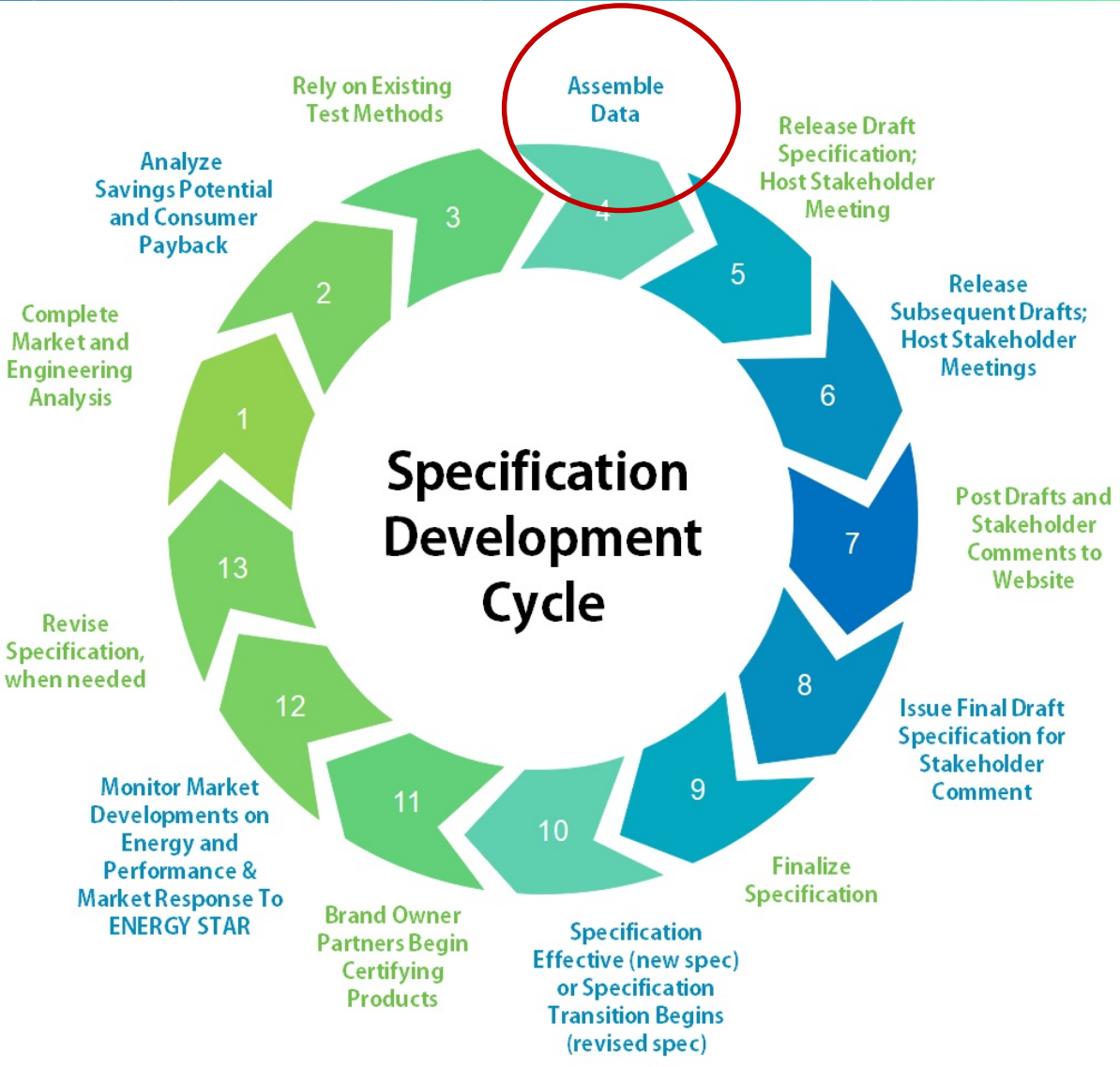

Specification Development Cycle
1
Complete Market and Engineering Analysis
2
Analyze Savings Potential and Consumer Payback
3
Rely on Existing Test Methods
4
Assemble Data
5
Release Draft Specification; Host Stakeholder Meeting
6
Release Subsequent Drafts; Host Stakeholder Meetings
7
Post Drafts and Stakeholder Comments to Website
8
Issue Final Draft Specification for Stakeholder Comment
9
Finalize Specification
10
Specification Effective (new spec) or Specification Transition Begins (revised spec)
11
Brand Owner Partners Begin Certifying Products
12
Monitor Market Developments on Energy and Performance & Market Response To ENERGY STAR
13
Revise Specification, when needed

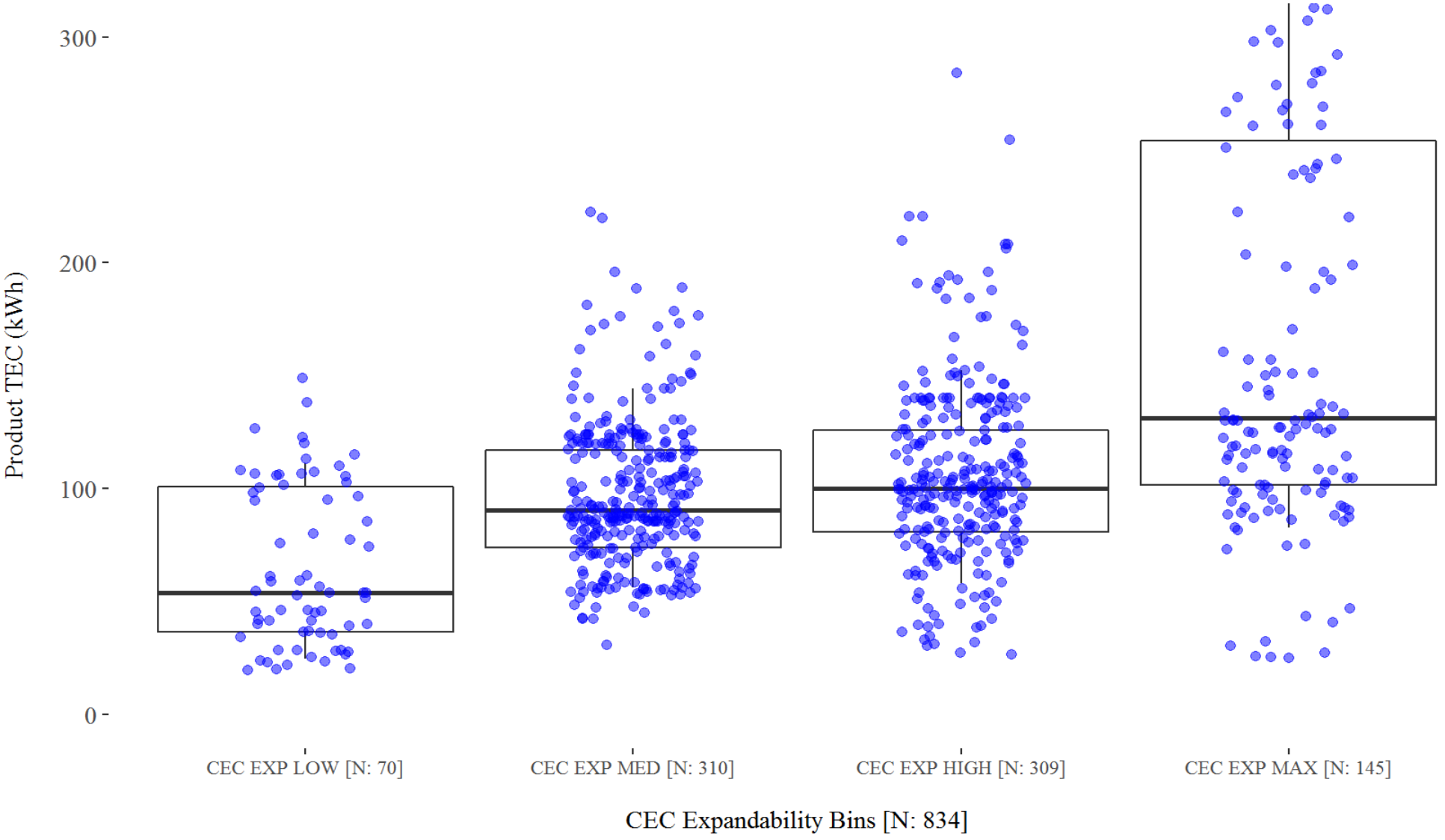
Categorization

- Stakeholders presented multiple options for consideration in March 2018:
  - P-Score
  - Expandability Score
  - Simplified Expandability Score
- No clear winner among the different options.
- Stakeholders would ideally like to see a metric that is currently in use vs. something new.

Categorization Approach

- EPA has narrowed its focus to two potential options.
  - P-score: Used in Version 6.0/6.1. Uses a combination of processor and graphics capability to determine appropriate performance category of product.
  - Expandability Score: Determines category based on PSU capability as well as presence of particular internal and external ports and interfaces. Used by the CEC.
- EPA collected data over the course of 2018 to more fully vet expandability score and its applicability to the ENERGY STAR program.
  - Data is from the ENERGY STAR certified product list and non-certified products supplied by ITI.

Figure 1: CEC Expandability Score Categorization Performance



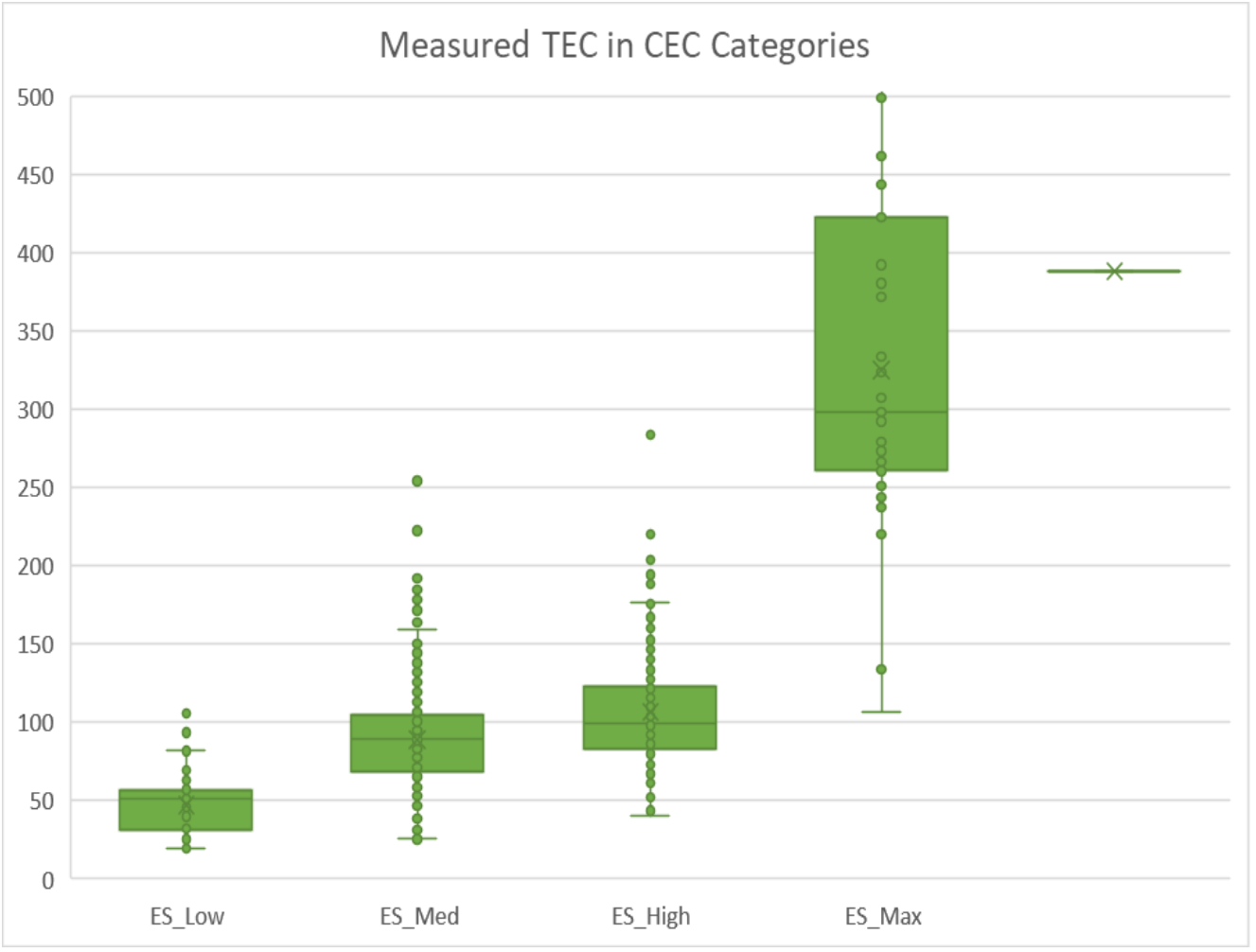
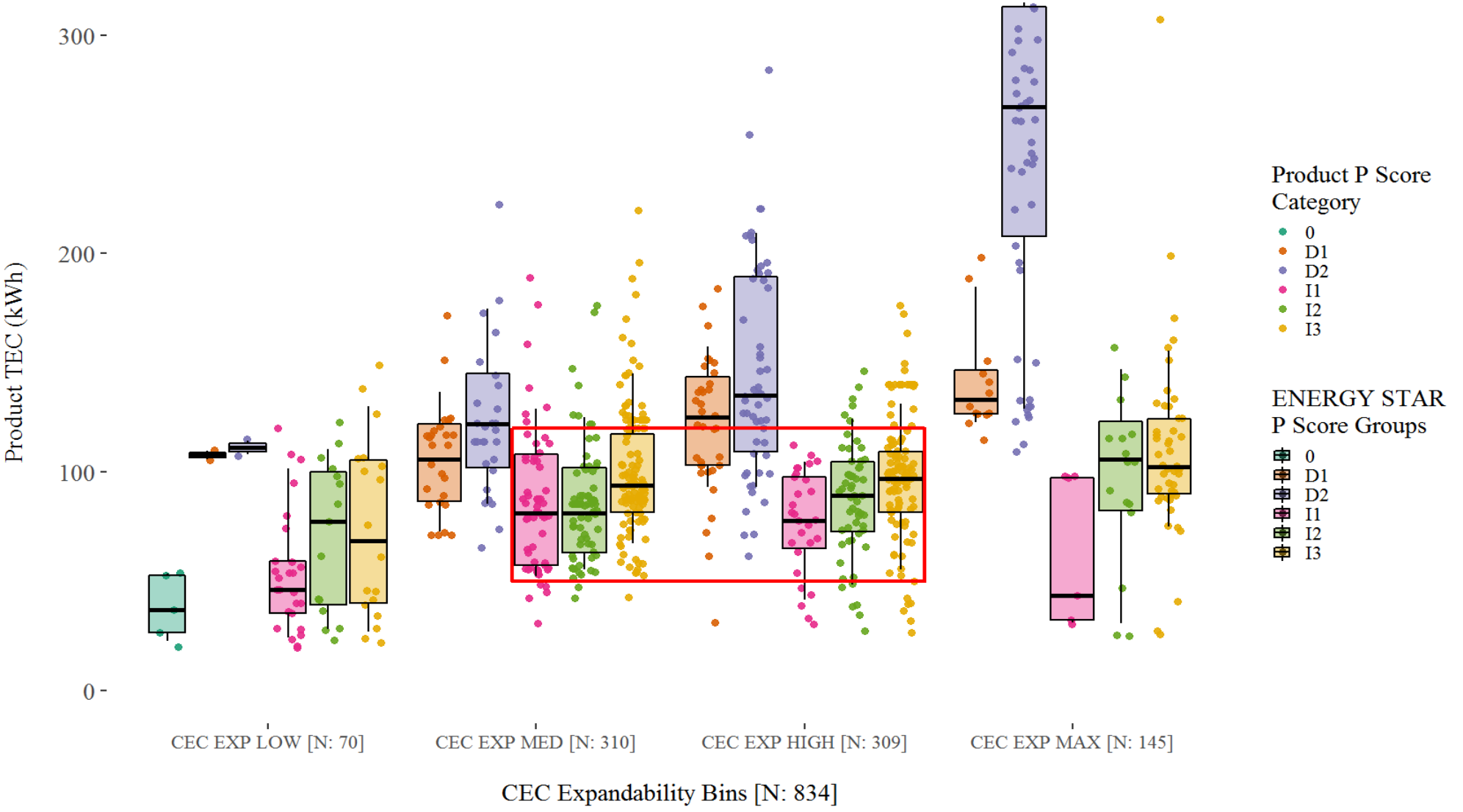
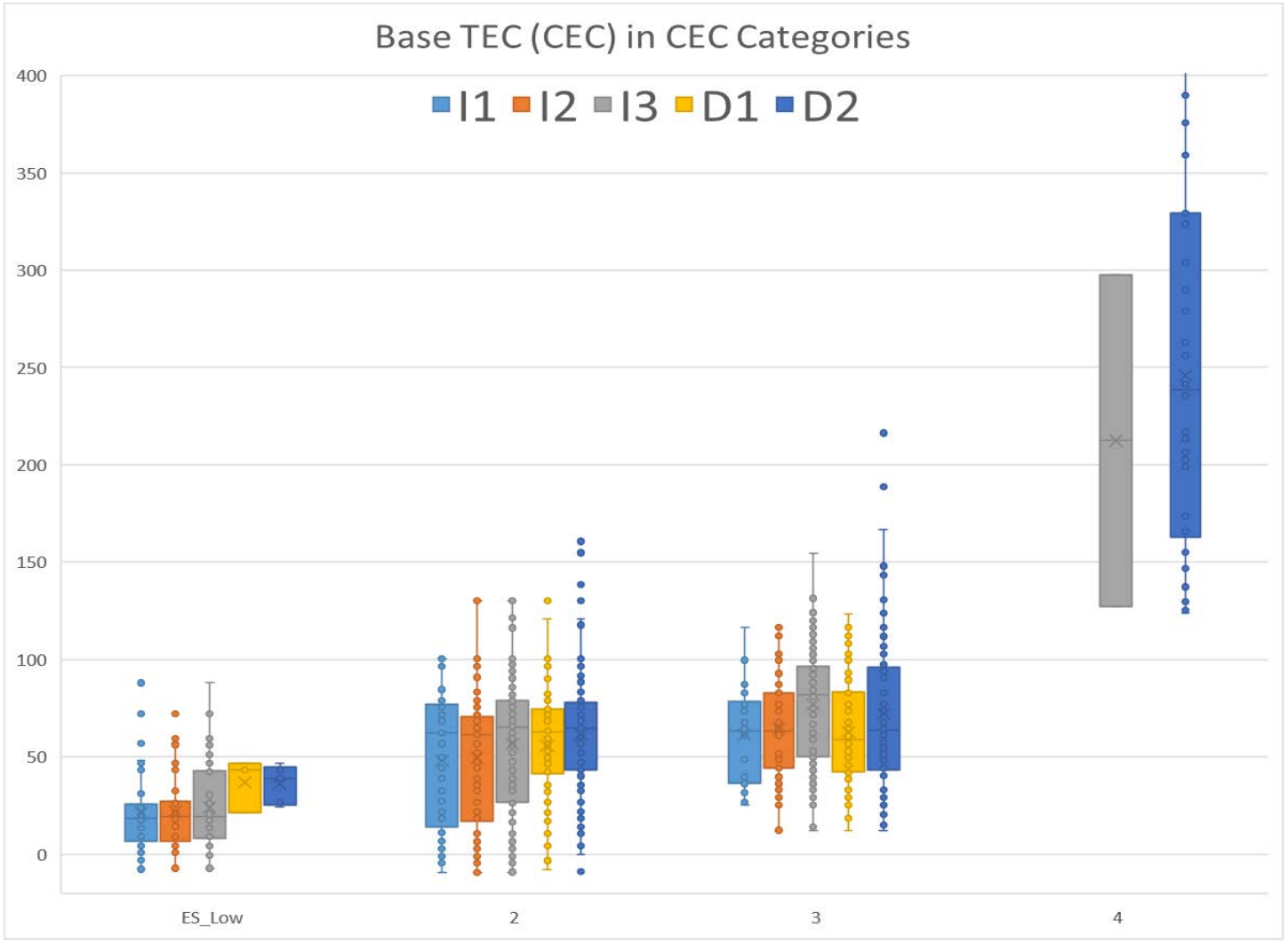

Measured TEC in CEC Categories
500
450
400
350
300
250
200
150
100
50
0
ES_Low
ES_Med
ES_High
ES_Max

Figure 2: CEC Expandability Score Categorization Performance




Base TEC (CEC) in CEC Categories
I1
I2
I3
D1
D2
400
350
300
250
200
150
100
50
0
ES_Low
2
3
4

Observations of EPA & ITI Analysis

- Not enough data fields to accurately determine CEC expandability score in a clear way for many products in the data set. This led to differences in:
  - Memory channel assumptions
  - Port capability assumptions (e.g. power delivery)
- Using different assumptions yielded similar final conclusions, but scale of energy use is lower in the ITI analysis
- This analysis reinforced the inherent complexity of expandability score, which raises concerns on its applicability at this time.

Categorization Approach

- Based on the current findings, EPA believes that the p-score offers the best path forward for Version 8.0.
  - EPA does believe that there is room for some modifications, similar to what was developed for notebook computers in Version 7.0.
- Further data and comment is welcomed at this juncture and EPA will continue to monitor the development of the expandability score metric for future specifications, as appropriate.

Categorization – Discussion

1. Are there other considerations that EPA should evaluate before deciding on use of an updated p-score desktop categorization approach in Version 8.0?
2. Are there additional data points that stakeholders would like to share on non-certified products to support this decision making regarding categorization?

Mode Weightings - Introduction

- In May 2018, EPA requested any additional mode weighting data to help inform the update of the current ENERGY STAR mode weightings, which have been used for nearly a decade.
- EPA received data from multiple stakeholders, which shows that the amount of time spent in each mode is much different than what is currently represented in the mode weightings.

Power State	Desktops (Current)	Desktops (Proposed)	Notebooks (Current)	Notebooks (Proposed)
T_{Off}	45%	30%	25%	25%
T_{Sleep}	5%	30%	35%	45%
T_{long_Idle}	15%	40%	10%	30%
T_{short_Idle}	35%		30%	

Mode Weightings – Power Management

- Currently, EPA provides incentive mode weightings related to certain power management settings.
- Since that time, there have been multiple new developments.
  - Data indicates that computers in the field largely have their power management enabled.
  - Data shows that computers are already spending a lot of time in off or sleep mode.
- EPA is now assessing additional opportunities to increase or improve the service offered in low power mode through this specification revision.

Mode Weightings – Discussion

1. Do additional stakeholders have large scale mode weighting data to help inform potential modified mode weightings for use in Version 8.0? If so, when can they be shared?
2. The existing mode weightings are based solely on enterprise systems, as this was the information available at the time, while the proposed weightings include residential usage as well. Is this an appropriate focus for ENERGY STAR, or should enterprise systems continue to be the focus?

Mode Weightings – Discussion (Cont'd)

3. During the development of Version 7.0, EPA received information that manufacturers were targeting connected Modern Standby as the key feature to reach the CEC standard levels for 2021. Is this no longer the case or what other options are being considered to reach these levels?
4. Data shared with EPA appears to indicate that power management is not turned off in the vast majority of systems, which is also supported with the mode weighting data shared above. Is there additional data that stakeholders have which would support or refute this conclusion?
    - Additionally, the original data that EPA received, which indicated that power management was being turned off, focused on enterprise systems, while the current dataset is a mix of both. Is there any nuance that EPA should be aware of related to enterprise computers that would lead to a different conclusion in the adoption of power management?

Mode Weightings – Discussion

5. Given the mode weighting data and the potential dramatic increase in power management adoption, is there a reason for EPA to consider continuing to incentivize features such as EMCA393 full capability, connected Modern Standby, and other solutions with comparable functions?

Non-Traditional SSD Options

- Increasing numbers of non-traditional solid state drive storage options are being developed in M.2 slot form factors.
  - Across all manufacturers.
- Currently, these devices are not eligible for storage device adders in the computer specification.
- Additional energy and performance data on these devices welcome to allow for consideration to apply current storage device adders to them, or whether a modified adder makes sense.

Non-Traditional SSD Options – Discussion

1. Are there any other forms of non-traditional based storage devices that EPA should consider in Version 8.0? If so, is there data available to address them if appropriate?
2. Are there other M.2 devices that provide functionality different than a storage device that EPA should account for in Version 8.0? If so, what are they and is there data available to address them if appropriate?

Internal Power Supplies

- In January 2018 EPA held a stakeholder meeting on internal power supplies, particularly low load power supply requirements.
- 80Plus completed some additional testing that the overall, power supply efficiency at lower load levels is consistently efficient.
  - Also, it was found that accurate measurements can be taken at the 5% load and there is a likely correlation with 100% load and 5% load.
- EPA will also reassess the internal power supply requirements for products at 500W or lower in V8.0.

Internal Power Supplies– Discussion

1. Do stakeholders agree with the assessment, based on 80Plus data, that the efficiency of the power supplies at 5% load is at an adequate level to not require specific criteria?
2. Is there any additional data that EPA should consider when determining if power supply efficiency has improved to the point that greater savings are possible for those products under 500W?
3. Is there any further data or comment on increasing the internal power supply requirements for products operating at less than 500W to 80Plus gold or equivalent to match the requirements at greater than 500W?

Resume Time from Sleep

- During V7.1, EPA was approached by stakeholders to reconsider the resume time from sleep element in the sleep definition.
  - Particularly the 5 second resume time for desktops and workstations.
- The U.S. Department of Energy worked with stakeholders to develop a test method, which will be included in Draft 1.

Resume Time – Discussion

1. Are there any additional data points that stakeholders would like to share to help inform EPA's assessment of resume time?

Scope

- **Multi-Screen Notebooks**
  - Computers that no longer have a mechanical keyboard.
  - Various iterations.
    - eInk Screen
    - Small second screen
    - Full 2nd screen
    - Foldable screens

- **Phone/Tablet Combo Product**
  - Foldable mobile phone that becomes a tablet.
  - Believed that these are out of scope as they are primarily a mobile phone.

Multi-Screen Notebooks

- EPA proposes a definition for Multi-Screen Notebooks.

- A computer that resembles a traditional notebook computer with a clam shell form factor, but has a second display that can be used a touch screen keyboard in place of a traditional mechanical keyboard. Multi-screen notebooks are considered notebooks in the remainder of this specification and are therefore not referenced explicitly.

Scope – Discussion

1. Are there any other products that manufacturers will be releasing that EPA should consider for inclusion or exclusion under the Version 8.0 specification?
2. Does the definition for multi-screen notebooks capture the various iterations of these products that are expected to be released over the life of the Version 8.0 specification?

Timeline for Version 8.0 Development

Comments due: February 20, 2019

- Q4 2018: Discussion Document, Collection of Data
- Q1/Q2 2019: Draft 1 specification and webinar
- Q2/Q3 2019: Draft 2 specification and webinar
- Q3/Q4 2019: Final Draft specification, Final specification
- Q3 2020: Version 8.0 effective

Final Questions or Comments

Thank You!

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