

DISCUSSION GUIDE

Version 6.0 ENERGY STAR Displays Specification Revision

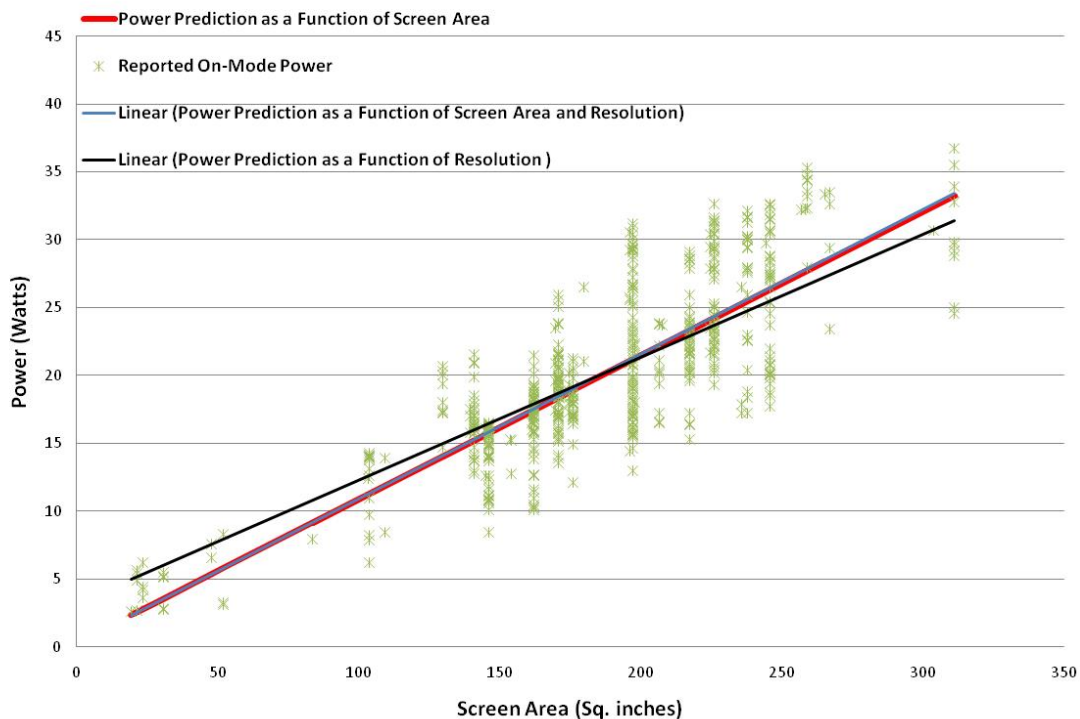
Topic 1: Resolution and Screen Area Parameters

During the Version 5.0 Displays specification revision process, it was determined that screen area alone was a weak predictor of power consumption for displays less than 30 inches diagonal. Data available at the time supported the inclusion of both resolution and screen area in the calculation of maximum On Mode power consumption levels. EPA has reviewed data from the current Qualified Products List to determine the feasibility of removing resolution from the maximum On Mode power consumption equation.

Based on the data in the ENERGY STAR Qualified Product List, EPA extrapolated predictions (see Figure 1) of the power that a display would consume if the On Mode power was calculated as a function of:

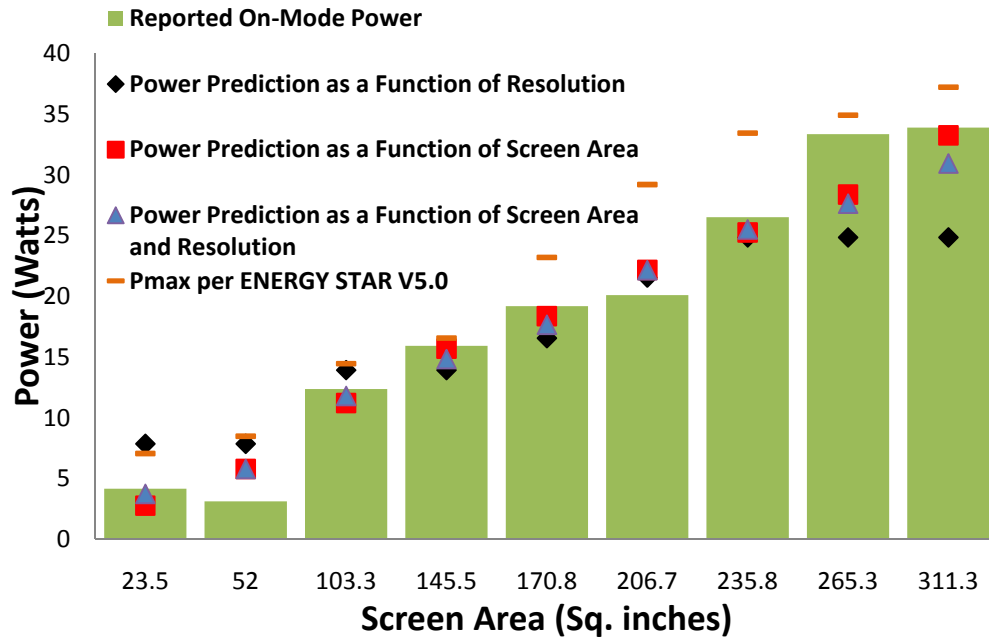
- Resolution;
- Screen Area; and,
- Both Resolution and Screen Area.

Figure 1: Power Predictions for Displays Less than 30"



The variation between the power consumption prediction as a function of screen area versus as a function of both screen area and resolution is only about 2 percent, with a mean absolute error of 0.05 watts. The relationship between these two approaches is illustrated for nine randomly selected models in Figure 2. Note that all of the selected models would have qualified for ENERGY STAR had the calculation for maximum On Mode power consumption been based only on screen area.

Figure 2: Power Predictions for Various Qualified Products



Issue 1 - EPA believes that removing resolution from the maximum On Mode power consumption equation is feasible and would be a step towards harmonizing the performance levels for displays and televisions. EPA seeks stakeholder feedback regarding this concept.

Topic 2: Automatic Brightness Control (ABC) Effectiveness

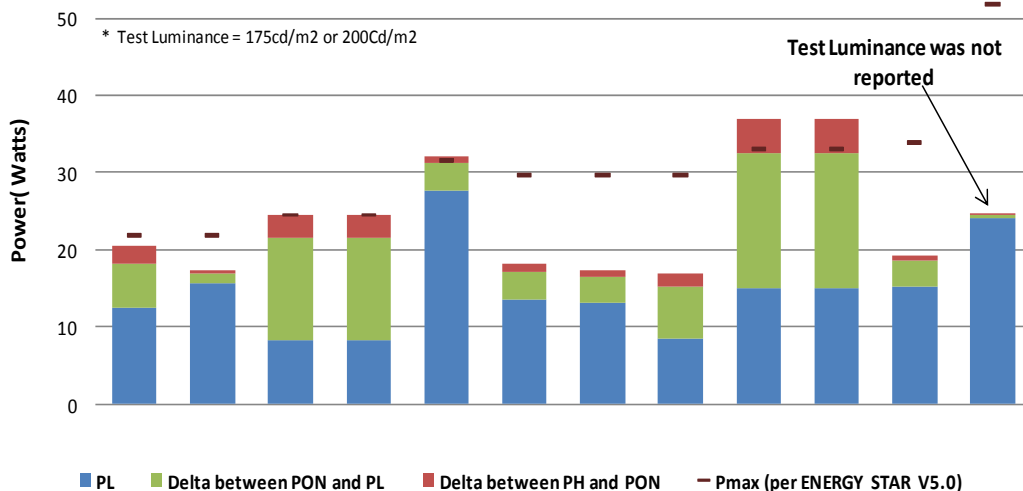
During the Version 5.0 Display specification revision, EPA noticed a substantial increase in the default luminance setting of displays in its data set. Consequently, EPA implemented a specification designed to reward products that ship with an ABC feature enabled by default. For these products, P_{ON} is averaged over both low and high ambient light conditions, assuming low ambient lighting conditions 20% of the time, and high ambient lighting conditions 80% of the time.

Recent field data and anecdotal evidence has shown substantial variability in manufacturers' implementation of ABC features. For example, some products increase screen luminance sharply at values slightly above 0 lux and then flatten out, making the ABC effect insignificant. Other products engage ABC at very high ambient light levels, thus eliminating any change in luminance and power consumption at the 0 to 300 lux test range specified by the current Displays Test Method.

EPA analyzed the ENERGY STAR Qualified Products List to determine the effects of ABC and concluded that:

- Most products with ABC do not achieve substantial energy savings due to the presence of ABC.
- For some models, the ABC feature does not engage within the test levels of 0 lux and 300 lux. Out of the 42 products that qualified with ABC enabled by default, only 12 reported a difference between the On Mode power measured at 0 lux and 300 lux (see Figure 3).
- Default test luminance is another source of variability, since some models are tested with a default luminance as low as 27cd/m^2 at 0 lux while others are tested with a default luminance of 175cd/m^2 to 200cd/m^2 at 0 lux.

Figure 3: ABC Power Savings for Selected Qualified Products



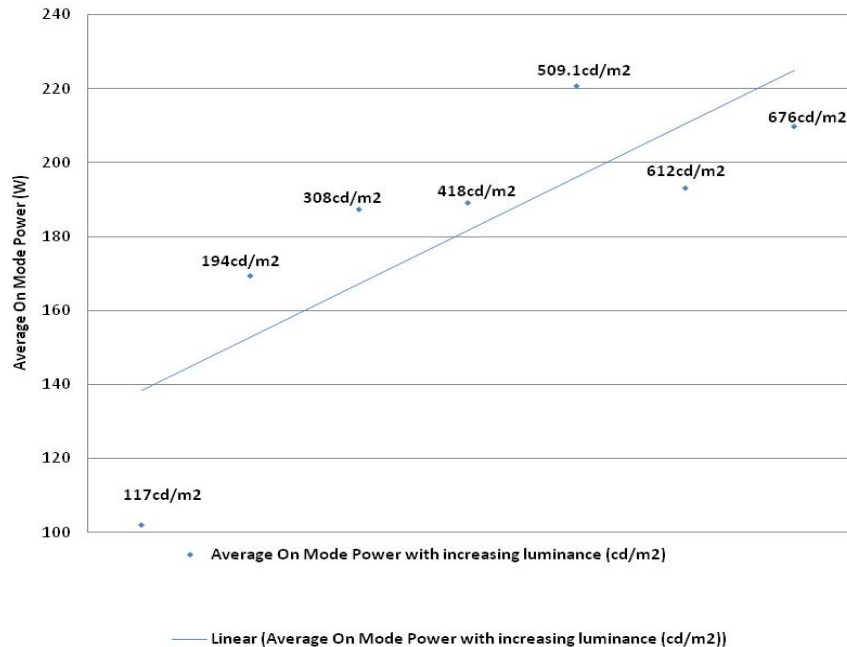
Issue 2 - Due to the variability in ABC implementation, additional data and a more thorough approach to testing power consumption with ABC enabled by default may be necessary. EPA intends to collaborate with stakeholders to evaluate alternate approaches for testing the performance of ABC. EPA is interested in getting stakeholder feedback regarding ways to standardize implementation of ABC in display testing.

Topic 3: Default Luminance Requirements for Professional Displays

Tier 1 of the Displays specification does not set a mandatory test luminance level for professional displays. Instead, manufacturers are required to test products in a mode which most resembles actual use (as-shipped) and report the default luminance. EPA has evaluated the Qualified Product List for professional displays and has concluded that a default test luminance may be required for testing On Mode power, since:

- a. There is a direct and increasing relationship between default test luminance and On Mode power (see Figure 4);
- b. Setting a default test luminance would allow for fair comparisons between products; and,
- c. The inclusion of a test luminance level will further harmonize the ENERGY STAR Displays and Televisions test methods.

Figure 4: Reported Average On Mode Power with Increasing Luminance (cd/m²)



Issue 3 – EPA is interested in getting stakeholder input on establishing for displays, greater than 30 inches, a default test luminance for testing and reporting On Mode power.

Topic 4: Stakeholder Feedback: Issues with Current Test Method and other Energy Related Attributes

EPA welcomes stakeholders' input on any issues relating to:

- a. The current testing conditions and procedure;
- b. Power saving features; and,
- c. Any other energy related aspects.

Finally, EPA is interested in understanding what types of activities display manufacturers engage in to reduce global warming gas emissions, especially NF_3 , SF_6 and CF_4 , beyond the product use-phase through examining emissions associated with the supply chain.

Webinar on ENERGY STAR Display specification revision

EPA is proposing to conduct a Web based meeting on **late January, early February 2011** to launch the ENERGY STAR Display specification revision. Webinar details will be distributed to stakeholders in early January 2011. The Webinar will focus on the following:

- Discuss feedback regarding issues presented in this discussion guide
- Develop a power consumption test data collection plan
- Outline the Specification Revision Time Line
- Discuss any additional industry feedback not addressed in this discussion guide

Industry Feedback and Resources

As with all ENERGY STAR specification development and revision efforts, EPA intends to run a transparent, open, and inclusive process that results in a high quality end product in a reasonable amount of time. As EPA moves forward with revising the ENERGY STAR Display specification, we will solicit input from stakeholders on an ongoing basis. The exchange of ideas and information between EPA, industry, and other interested parties is critical to developing a meaningful specification and contributing to the overall success of ENERGY STAR. As such, we welcome and look forward to your input and participation in all aspects of the specification development process.

Additionally, EPA encourages all stakeholders to visit the ENERGY STAR Website periodically at: <http://www.energystar.gov/productdevelopment> for important updates and resources. In addition to official documents, presentations and draft revisions of the specification, this Web page also will include written comments EPA receives from stakeholders, unless marked as confidential.