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Via E-Mail

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The Consumer Technology Association (CTA)™ appreciates the opportunity to submit comments to EPA on its Draft 2 Version 8.0 ENERGY STAR Displays specification.

The Consumer Technology Association (CTA)™ is the trade association representing the \$377 billion U.S. consumer technology industry, which supports more than 15 million U.S. jobs. More than 2,200 companies – 80 percent are small businesses and startups; others are among the world’s best-known brands – enjoy the benefits of CTA membership including policy advocacy, market research, technical education, industry promotion, standards development and the fostering of business and strategic relationships. CTA also owns and produces CES® – the world’s gathering place for all who thrive on the business of consumer technologies. Profits from CES are reinvested into CTA’s industry services.

For many years, the technology sector has been a supporter of energy efficiency initiatives related to the consumer technology industry at the state, federal and international levels and has supported advanced energy efficiency as part of the industry’s broader commitment to environmental sustainability. Our industry’s involvement in the successful ENERGY STAR program is over 20 years old.

We appreciate your consideration of these comments and welcome the opportunity for further dialogue on these issues.

#### **Equation 4 Recommendation**

Equation 4 of draft 2 has only one variable, G, which does not reflect different optical power characteristic of sRGB & Adobe RGB models and screen sizes. To ensure an appropriate level of EEP allocation, factors that affect the color Gamut must be taken into consideration.

CTA proposes to use the following equations to determine the energy allowance for enhanced performance displays:

- EEP for **sRGB** = **0.1 x E<sub>TEC\_MAX</sub>**
- EEP for **Adobe** = **0.5 x E<sub>TEC\_MAX</sub>**

The current **E<sub>TEC\_MAX</sub>** formula should be used in the calculation to cater for power requirement of different screen sizes. Using specific coefficients better reflect the inherent optical power characteristic of sRGB & Adobe RGB models. Power efficiency of sRGB is different from Adobe RGB models (See table 1).

Coefficients of 0.1 and 0.5 can be applied to cater for sRGB & Adobe RGB inherent power efficiency difference, respectively. This proposed EEP equation has considered the panel's transmittance and BLU efficiency.

Color Gamut	Panel Transmittance	LED Efficiency	Panel Power Efficiency
72% NTSC	100%	100%	100%
sRGB	97%	93%	90%
Adobe RGB	60%	84%	50%

Table 1: Optical Power Characteristics of sRGB & Adobe RGB Models

**Enhanced Performance Display Allowance**

EPA is proposing to raise the minimum Total Native Resolution requirement from 2.6 to 3.6 megapixels (MP) for models to access the enhanced performance display allowance. As EPA mentioned, they found that many models did not have Color Gamut accurately reported to CIE LUV space and it was therefore unable to assess the full set of models. Using a limited dataset, EPA found no significant relationship between Color Gamut and power for models with Total Native Resolution below 3.6 megapixels

Because of the limited dataset and reporting discrepancies, CTA proposes that EPA revert to the draft 1 native resolution of greater than or equal to 2.3 MP, instead of the newly proposed 3.6MP. In addition, FHD resolution (MP=2.07) is classified as mainstream segment where WUXGA (MP=2.3) is classified as premium segment. WUXGA is set to cover sRGB rather than NTSC 72%, whereas resolutions higher than WUXGA covers Adobe RGB.

**Equation 8 – Curved Display Energy Allowance**

EPA's reduction of EPS allowances are too drastic. CTA recommends an allowance of 30% to provide consistency with CEC regulation. This is the same adder as California Energy Commission for curved displays. Different curvature of TFT and Color Filter layers causes a larger misalignment between the layers due to mechanical stresses; resulting in crosstalk between the sub pixel colors (See Figure 1). In order to prevent cross talk between sub pixels, the design of the TFT needs to be modified at the expense of lower transmittance efficiency. This would mean a 30% drop in panel transmittance efficiency for curved displays. The CTA proposed equation below more accurately reflects the optical efficiency of a curved display:

- $E_C = 0.30 \times E_{TEC\_Max}$

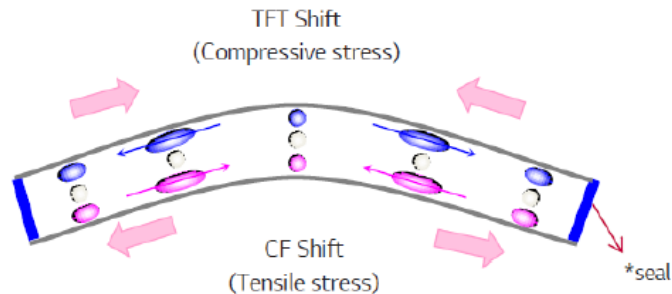


Figure 1: TFT and Color Filters Causing Misalignment

### Signage Displays

Signage Display: An Electronic Display intended for multiple people to view in non-desk based environments, such as retail or department stores, restaurants, museums, hotels, outdoor venues, airports, conference rooms or classrooms. For the purposes of this specification, a Display shall be classified as a Signage Display if it meets three or more criterion listed below:

- (1) Diagonal screen size is greater than 30 inches;
- (2) Maximum Reported Luminance is greater than 400 candelas per square meter;
- (3) Pixel density is less than or equal to 5,000 pixels per square inch;
- (4) Ships without a mounting stand designed to support the display on a desktop; or
- (5) Designed to be operated by an external data controller or remote management system.

CTA propose to change the pixel density requirement for signages displays from 5,000 pixels per square in to 7,000 pixels per square in. As screen resolution trends higher, pixel density will also increase.

### USB Type-C Connectivity

For monitors with Type-C connectivity EPA should consider allocating power allowance of 2W.

### Maximum TEC for Monitors <300in<sup>2</sup>

CTA asks EPA to implement a separate and higher area coefficient value for sizes > 300in<sup>2</sup>. All models greater than 300in<sup>2</sup> and a resolution greater than FHD cannot meet ENERGY STAR. Due to consumer need for these mainstream models EPA should incorporate additional energy allowance for these monitors.

CTA thanks EPA for the opportunity to provide further feedback on the specification for Displays.

Sincerely,

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CTA