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EnergyStar6.0 Assessment & Feedback

Product Development, Visuals BU

Thank You

- Lenovo appreciates the opportunity to participate and provide feedback in the Energy Star draft revision process by the EPA
- Lenovo is committed to environmental leadership in all of our business activities from operations to product design and recycling solutions. We support EPA's efforts to protect the environment through energy efficient products and practices.

Lenovo's Commitment to the Environment

- Lenovo is an industry leader with respect to energy efficient products, the use of environmentally preferred materials and green product packaging.
- In 2008 Lenovo led the industry and was the first to switch from a 4-lamp CCFL monitors to a more efficient 2-lamp CCFL design.
 - Result was about 30% reduction in power consumption, as well as reduction of mercury used to build a display.
- Lenovo's ThinkVision Monitors were the first to have a full line-up with Energy Star 5.0 rating in the industry

Lenovo supports new changes by the EPA

- Lenovo supports EPA's proposal of the adoption of the IEC 62087, Version 2 standard for testing displays
- Lenovo support EPA's new programs to further improve energy efficiency such as the 'Most Efficient' program
- Lenovo will provide EPA the test data based on new test method with 'ENERGY START Display Draft Test Method Data Assembly Form'

Lenovo Has Comment For Below Items

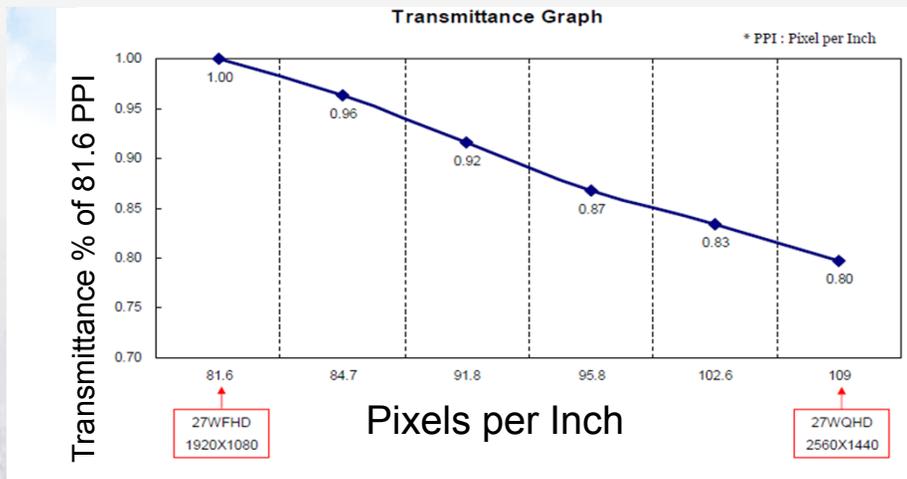
- **“Resolution and Screen Area Parameters”**
 - EPA is approaching to remove the resolution factor from the formula
- **“Default Luminance Requirements for Professional Displays”**
- **“The current Test Method and other Energy Related Attributes”**

Lenovo's Opinion — On “Resolution and Screen Area Parameters” - 1

Lenovo suggests to keep resolution factor in the formula due to below reason:

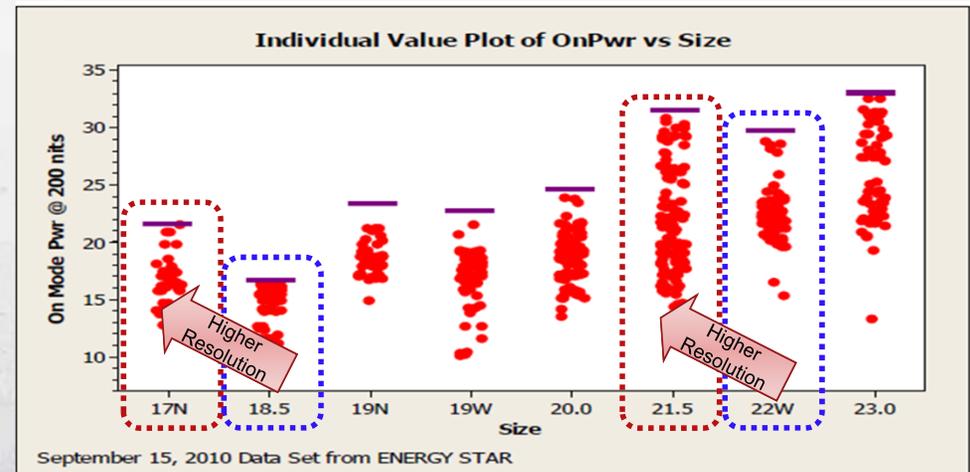
- Unlike TV, there is wide variation in display resolutions. Resolution plays an important role in image quality.
- Variation in resolution needs to be considered in order to prevent penalizing higher image quality displays.
- On average, the test data shows that the same size displays with higher resolution have higher power consumption.

Resolution impacts the display transmittance
Transmittance directly impacts display power consumption



** Data is provided by LGD

In some cases power doesn't increase as the size increases, the resolution is the key factor. (e.g. 18.5" vs high res 17", 22" vs high res 21.5")



** Data from EPA website

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Lenovo's Opinion – On “Resolution and Screen Area Parameters” -2

Lenovo suggests to keep resolution factor in the formula due to below reason:

- The same size displays with higher resolution have higher power consumption

Product Type	Backlight	Diagonal Viewable Screen Size (in.)	Maximum Resolution (pixels)	Watts in On
Monitor	LED backlighting	21.5	1920 x 1080	21.6
Monitor	LED backlighting	21.5	1920 x 1080	23.4
Monitor	LED backlighting	21.5	1600 x 900	17.3
Monitor	CCFL backlighting	21.5	1600 x 900	19.2
Monitor	LED backlighting	21.5	1600 x 900	17.3

In addition to 21.5”, other sizes (e.g. 22”, 27”) have the same result

(*Test data from EPA website)

Lenovo understands and agrees with the EPA position on being technology neutral.

Resolution is a specification for a display panel, not a specific technology.

Taking resolution out of the specification will favor low resolution displays (lower spec)

This is not an issue in TV, almost all TVs today (in all sizes) are full HD (1920 x 1080).

In order to ensure a robust test method, Lenovo suggests to keep resolution factor in the formula.

Lenovo's Opinion — on “Default Luminance Requirement of Professional Displays”

Default Luminance Requirements for Professional Displays

Lenovo Comment: Lenovo suggest to set a fixed data (suggest 180nits) as default luminance.

Reason:

1. 180nits as default setting is common in industry for sizes below 30”
2. Default setting is commonly used by customers, most customers use default setting directly
3. A fixed luminance for on mode power measurement encourages improved energy efficiency independent of the performance level. By not fixing the luminance requirement, power compliance can be achieved by reducing device performance.

Lenovo's Opinion — on “The current Test Method and other Energy Related Attributes”

Row 185: A 500 mm measurement distance is recommended for LMDs.

Lenovo Comment:

- The Luminance Measured area will influence the test result especially when the Brightness Uniformity is not good(not distributed equally at each area). So the requirement in current EPA6.0 draft1 is not enough.
- **Suggest to add another requirement:**
Distance=500mm and at the same time AFOV \geq 1 degree. It can make sure the measured area be at least 200 pixels.
Or, do not limit the measurement distance to 500mm, just limit **the measured area to be at least 500 pixels** or 200 pixels.

thank you grazie **merci** danke **grazias** 謝謝 **спасибо**
gracias **obrigado** ありがとう **dank** takk **bedankt** dakujem