ENERGY STAR Displays Product Specification Draft 1 Version 6.0 Webinar

June 22, 2011

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ENERGY STAR Program

Webinar Details

- Webinar and related materials will be available on the ENERGY STAR Displays PD page:
  - www.energystar.gov/productdevelopment
  - *Revisions to Existing Specifications*

- Audio provided via conference call in:

Call in:	+1 (877) 423-6338 (Toll-free) +1 (571) 281-2578 (Toll)
Code:	707775

- Please keep phone lines on mute while not speaking.

- Please refer to the agenda for approximate discussion timing

Comments

- In addition to providing verbal comments during today's Webinar, stakeholders are strongly encouraged to submit written comments and test data
- Please send all comments to:

displays@energystar.gov

Comment Deadline
Monday, July 18, 2011

Agenda

Topic	Time
Introduction	1:00 – 1:15
Harmonization Efforts	1:15 – 1:30
Draft Test Method	1:30 – 2:30
Draft 1 Specification, Seeking Stakeholder Feedback on Following:	
Scope	2:30 – 2:45
Resolution	2:45 – 3:00
On Mode (Data Assembly), Sleep and Off Modes/ Power Management	3:00 – 3:15
Conformance with proposed F-gas, toxicity, recyclability requirements	3:15 – 3:30
Timeline and Next Steps	3:30 – 4:00

Activities to Date

- December 27, 2010: Specification Revision Launch
- February 24, 2011: Stakeholder Kickoff Webinar
- June 3, 2011: Publication of Draft 1 Version 6.0 ENERGY STAR Specification and Test Method
  - All materials related to the specification revision process can be found on the ENERGY STAR Displays Product Development Page:
    - Energystar.gov/productdevelopment
    - Revisions to Existing Specifications
    - Displays
  - Or here:
    - http://www.energystar.gov/index.cfm?c=revisions.display_spec
- Today, June 22, 2011: Stakeholder Webinar to present work and receive comment

Webinar Objectives

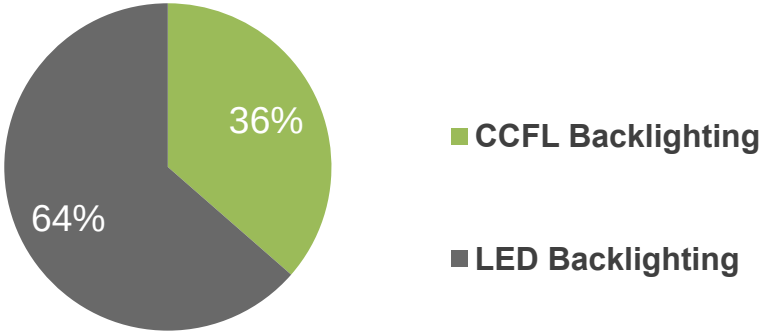
1. Introduce proposed modifications to the test method.
   - Resolve and clarify any questions.
2. Introduce proposed modifications to the specification where EPA welcomes further stakeholder input.
3. Provide opportunity for stakeholder feedback and open the floor for discussion.

ENERGY STAR Qualified Displays

- The Version 5.1 ENERGY STAR Displays Product Specification is currently in effect
  - Requirements for displays less than 30” became effective October 30, 2009
  - Requirements for displays 30” to 60” became effective January 30, 2010
- As of June 7, 2011, 43 ENERGY STAR partners have qualified a total of 1451 displays under Version 5.1
  - 39 Digital picture frames
  - 1334 Monitors
  - 78 Signage Displays

ENERGY STAR Qualified Displays: Technology and Size

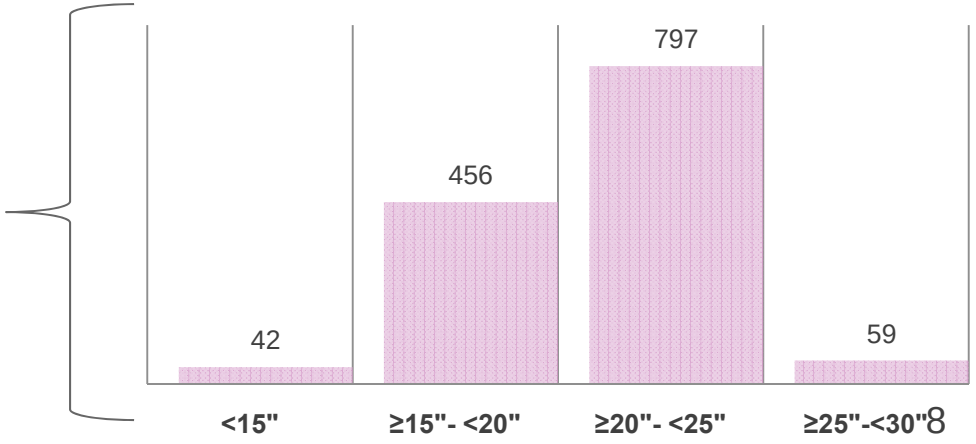
Backlighting technology for ENERGY STAR qualified units under 30" in diagonal screen size



- LED is most common backlighting technology for displays less than 30” in diagonal size.
- CCFL backlighting is more common for displays greater than 30” in diagonal size
  - Approximately 64% of the displays within this range qualified with CCFL

Majority of displays qualified within the <30“ diagonal screen size range.

Qualified Displays Under 30” in Diagonal Screen Size



Harmonization Efforts

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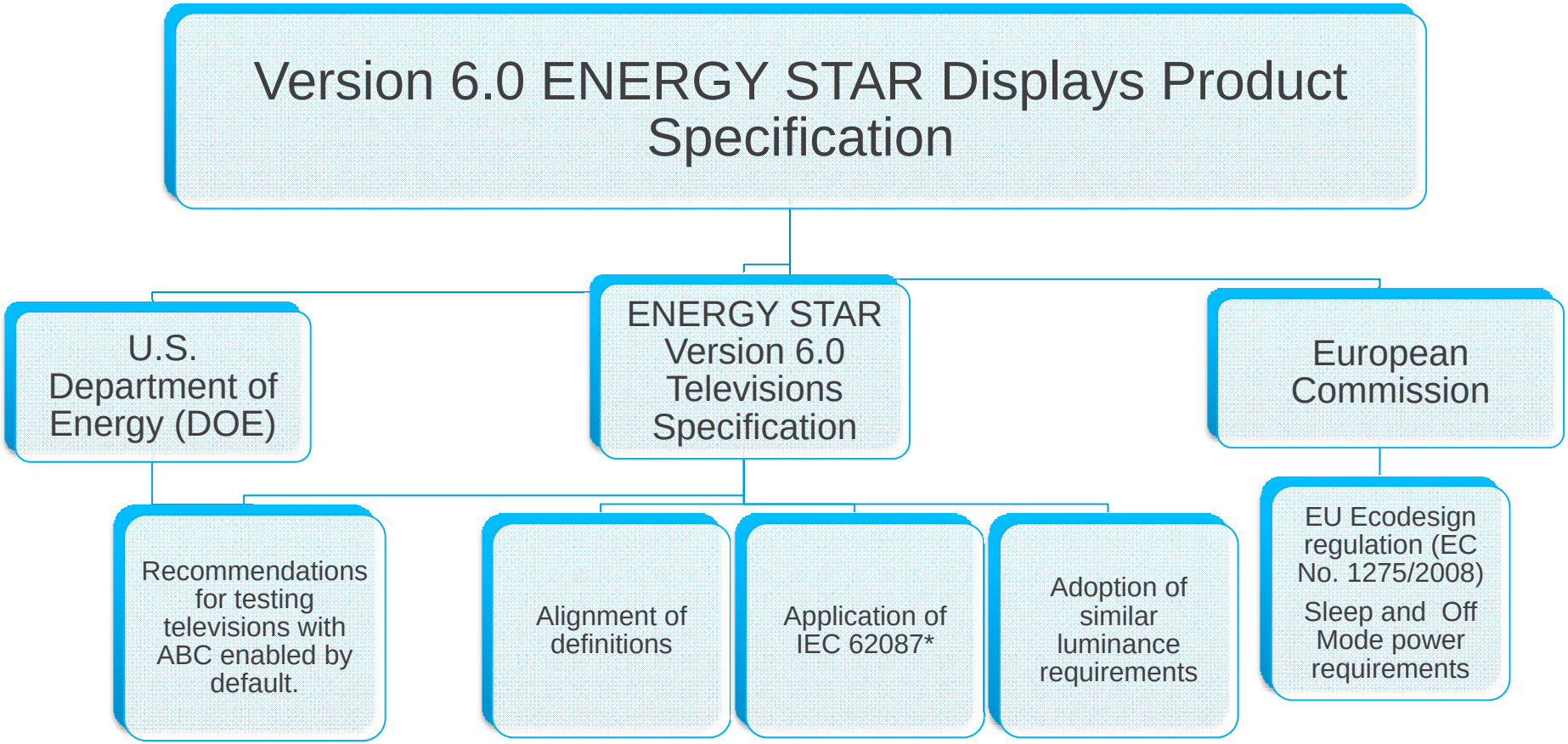
Harmonization Overview



*International Electrical Commission (IEC) standard IEC62087, Ed 2.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment.

Draft Test Method

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Adoption of IEC 62087

- For Version 6.0, EPA is proposing the adoption of the IEC 62087 standard for testing displays of all inclusive screen sizes
  - Current specification, Version 5.1, utilizes VESA Flat Panel Display Measurements (FPDM) Standard, Version 2 for testing On Mode power for displays less than 30” in diagonal screen size
  - Displays 30” -60” in diagonal screen size test On Mode power using IEC 62087
- Unifies with the ENERGY STAR Test Method for Televisions

Testing On Mode Power Using IEC 62087

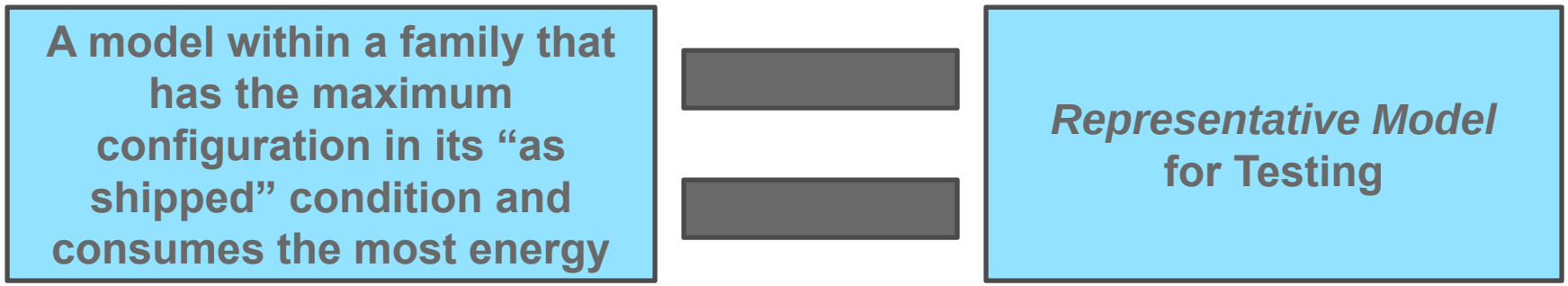
- EPA strives to ensure that testing for ENERGY STAR qualification resembles intended product usage and proposes for Partners to test their products using both:
  - ***Dynamic Broadcast Content,*** and
  - ***Internet-Content Video Signal***
- In cases where the product cannot display moving images, Partners may test their products using the ***Static Content Video Signal***

EPA invites stakeholders to comment on any clarifications needed in using IEC62087 to test all display products and on any issues associated with the application of this standard.

If differences exist for On Mode power consumption using the Dynamic Broadcast Content and Internet-Content Video Signal, stakeholders are asked feedback on how to weight them for On-Mode Power consumption levels to represent consumer usage. EPA will propose levels in Draft 2.

Product Family and Representative Model for Testing

- To clarify the constitution of a product family, EPA is proposing for the highest energy using configuration within the family to be considered the Representative Model for testing.



EPA welcomes stakeholder input pertaining to situations where the proposed clarification is not applicable and might not provide accurate information to the consumer.

Network and Data Connectivity

- Market trends indicate future growth and expansion of displays that have network and/or data capability.
- Currently, there are displays sold in the market that have network capability (e.g. Ethernet, Wi-Fi) and may serve as the main connector to common peripherals and mobile devices.
- Network capability may increase the power consumption of a Display product in the On, Off and Sleep mode.
- EPA has included a provision for testing power consumption of displays with network capabilities within the test method.

Network Connections

- EPA believes that engaging the USB/Firewire/Thunderbolt hub controller (or similar) when testing a display product will resemble the state of the hardware when used by a consumer.
- The proposed test method suggests for displays that have network capability to:
  - Configure the display unit with the networking features activated,
  - Follow the order of preference for making the bridge connection between the host and the display

Stakeholders are invited to comment on the prevalence of displays with network connectivity and its associated power consumption in On, Sleep and Off Mode.

Automatic Brightness Control

- EPA proposes adopting test conditions for ABC enabled by default that have been recommended by DOE for televisions to harmonize with the ENERGY STAR Version 6.0 draft specification for televisions.

- In the current specification, Version 5.1, displays are required to test at illuminances of 0lux and 300lux.
  - Assumes displays use 80% in high ambient conditions and 20% of the time in low ambient conditions.

Automatic Brightness Control

- EPA is proposing the testing of ABC at four different room illuminances; 10lux, 100lux, 150lux, and 300lux, using the following average approach:

$$P_{ON} = (0.25 \times P_{broadcast\_10lux}) + (0.25 \times P_{broadcast\_100lux}) + (0.25 \times P_{broadcast\_150lux}) + (0.25 \times P_{broadcast\_300lux})$$

EPA welcomes stakeholder test data for displays with ABC enabled by default and feedback on:

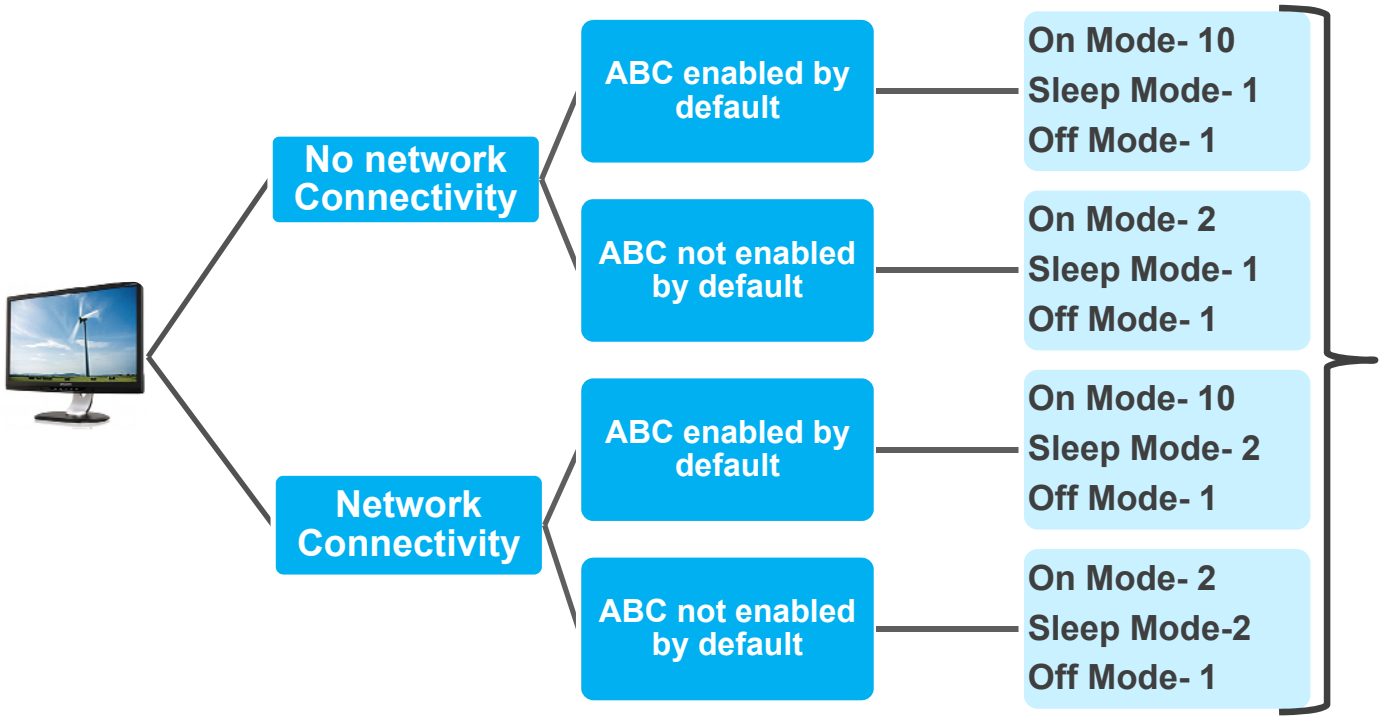
-Are these room illumination levels appropriate for displays of all sizes?

- If so, are the weights associated with each of the proposed ambient lighting conditions appropriate for displays of all sizes, including larger displays used in commercial and outdoor applications?

Some Clarification of the proposed Test Method

Recent Stakeholder Questions	EPA Response
What is the testing procedure for a display product that transmits both video signal and network data over the same connection?	EPA does not intend to require a separate connection in such cases. We would like to assemble a list of examples.
Are USB powered displays covered under the scope of this version of the program requirements? If yes, what is the test procedure and set up?	Yes. AC power is measured from a suitable DC source (e.g. powered USB hub).
How do you test displays that cannot turn the network connectivity off?	Test the product "as-shipped" and report this fact in the test results.

Flowchart Depicting Test Method



Number of tests, including the dynamic broadcast video content and the internet video content

The total number of tests required for products shipped with ABC enabled by default include testing at the four proposed ambient light conditions as well as the On Mode power with ABC disabled.

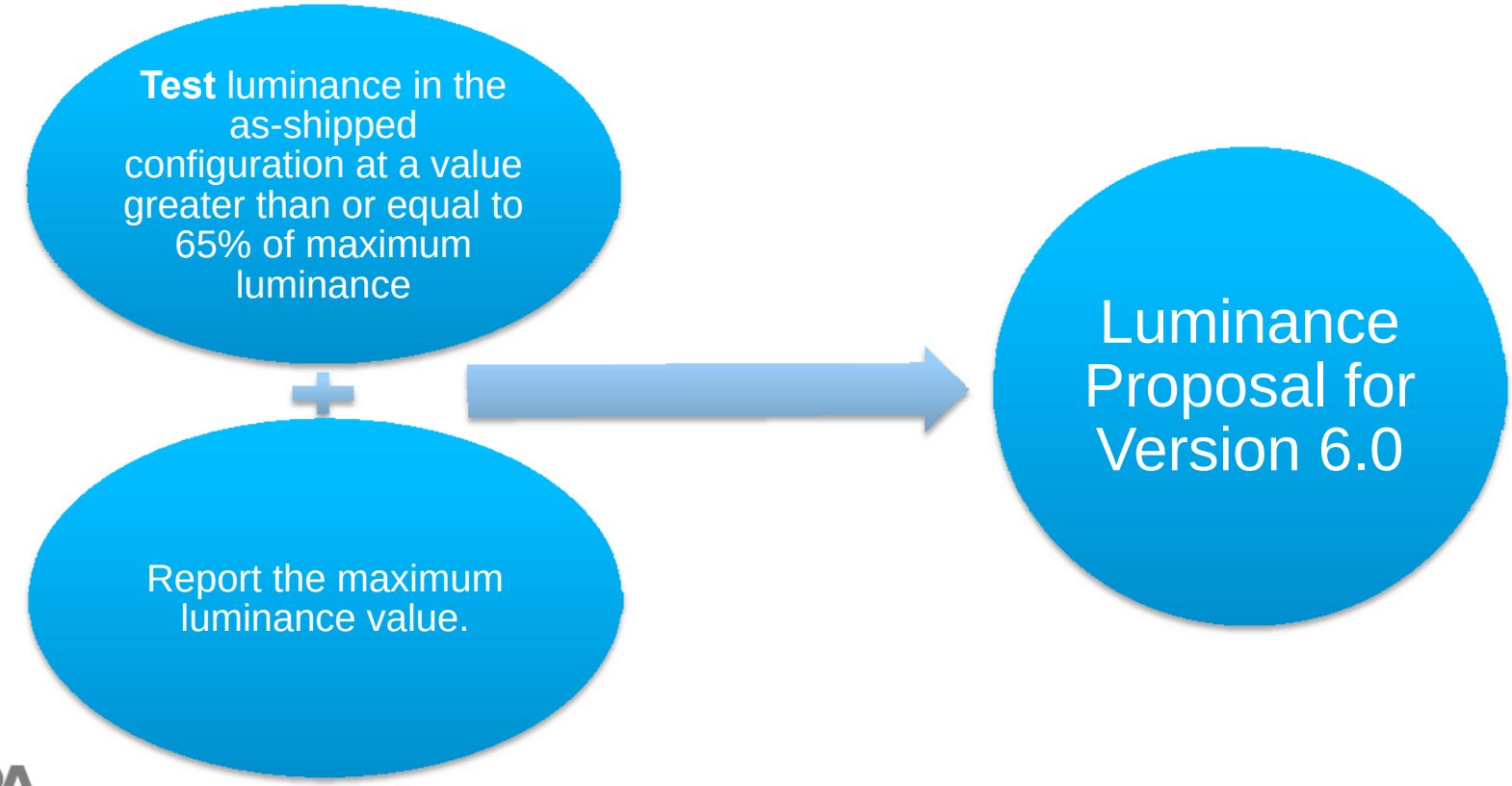
Clarification Pertaining to the Proposed Number of Required Tests for setting Efficiency Levels

Display Product Scenario	Dynamic Broadcast Video Content			Internet Video Content			Total Number of Tests
	ON	SLEEP	OFF	ON	SLEEP	OFF	
No Network Connectivity	1	1	1	1	N/A	N/A	4
No Network Connectivity with ABC Enabled- *includes On Mode power with ABC disabled.*	5	1	1	5	N/A	N/A	12
Network Connectivity	1	2	1	1	N/A	N/A	5
Network Connectivity with ABC Enabled- *includes On Mode power with ABC disabled*	5	2	1	5	N/A	N/A	13

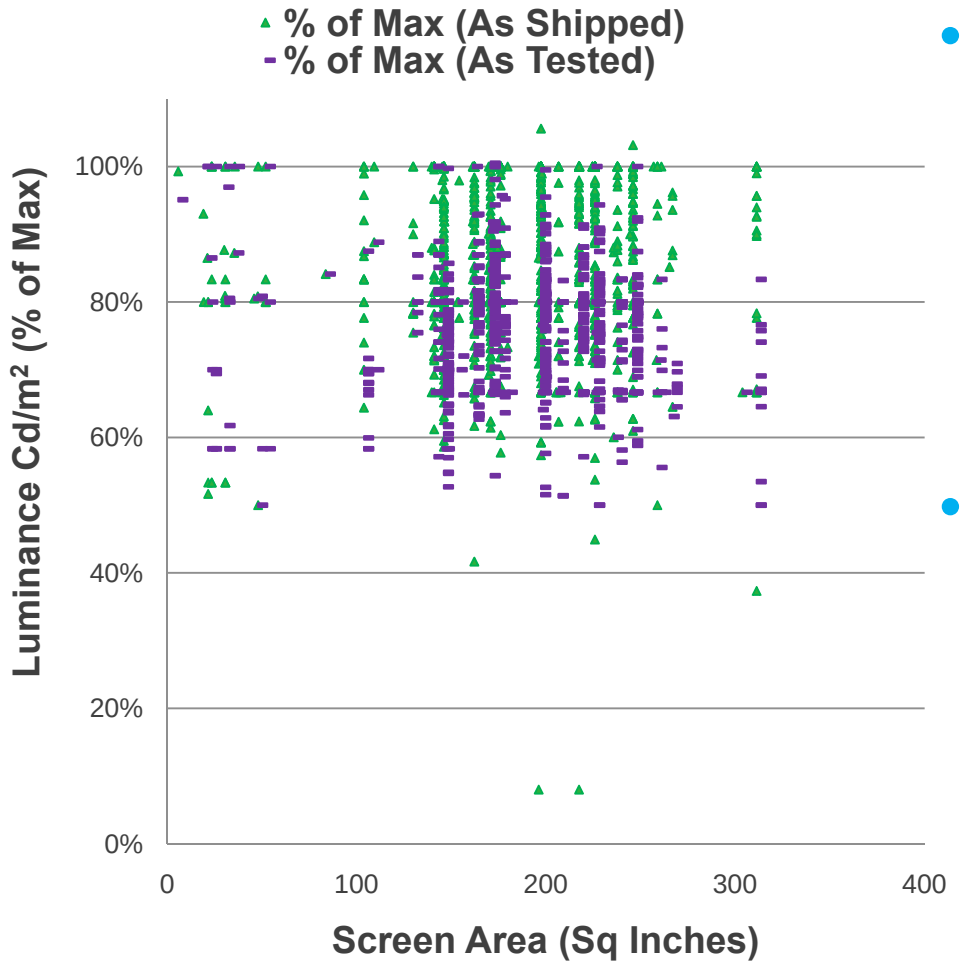
EPA will evaluate opportunities to streamline testing once it receives data to propose On Mode levels and once it understands the difference in power consumption using the Dynamic Broadcast vs. Internet-Content Loop.

Luminance Testing

- Luminance plays an important role in the power consumptive properties of displays.

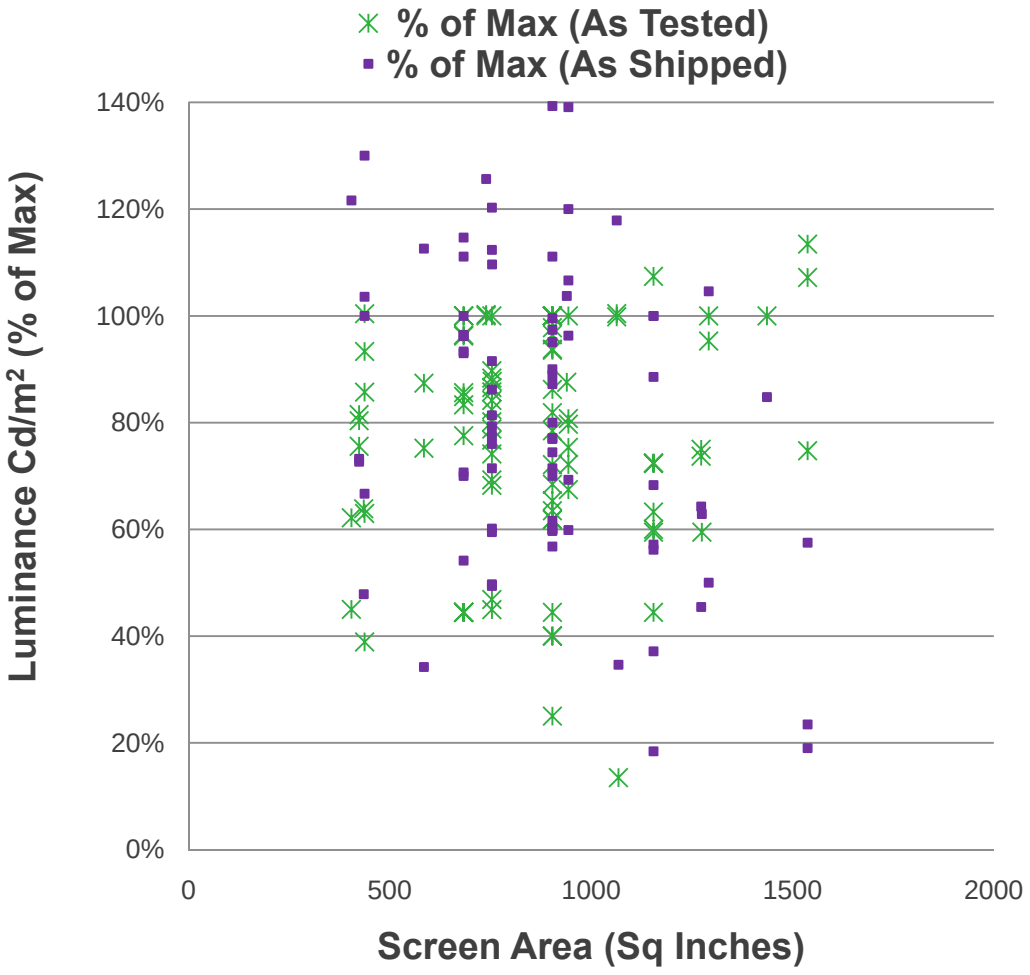


Version 5.1 Luminance Values for Qualified Displays <30” in Diagonal Screen Size.



- Version 5.1 requires displays to be tested at a luminance of:
  - 175Cd/m2 (displays less than 1.1MP resolution)
  - 200Cd/m2 (displays greater than 1.1MP resolution)
- Many of the currently qualified displays under 30” in diagonal screen size utilized a luminance of at least 65% of the maximum luminance.

Version 5.1 Luminance Values for Qualified Displays with a Diagonal Screen Size 30”-60”



- EPA currently requires Partners to test their products at a default luminance and report these luminance levels.
- Approximately 45% of displays shipped with a luminance greater than the tested luminance*.
- Some partners reported maximum luminance values lower than the as shipped or as tested luminance.

*Analysis is based on the 1,147 display models that qualified for the ENERGY STAR Display Specification as of March 2011, which are listed on the ENERGY STAR Qualified Product List.

Draft 1 Specification

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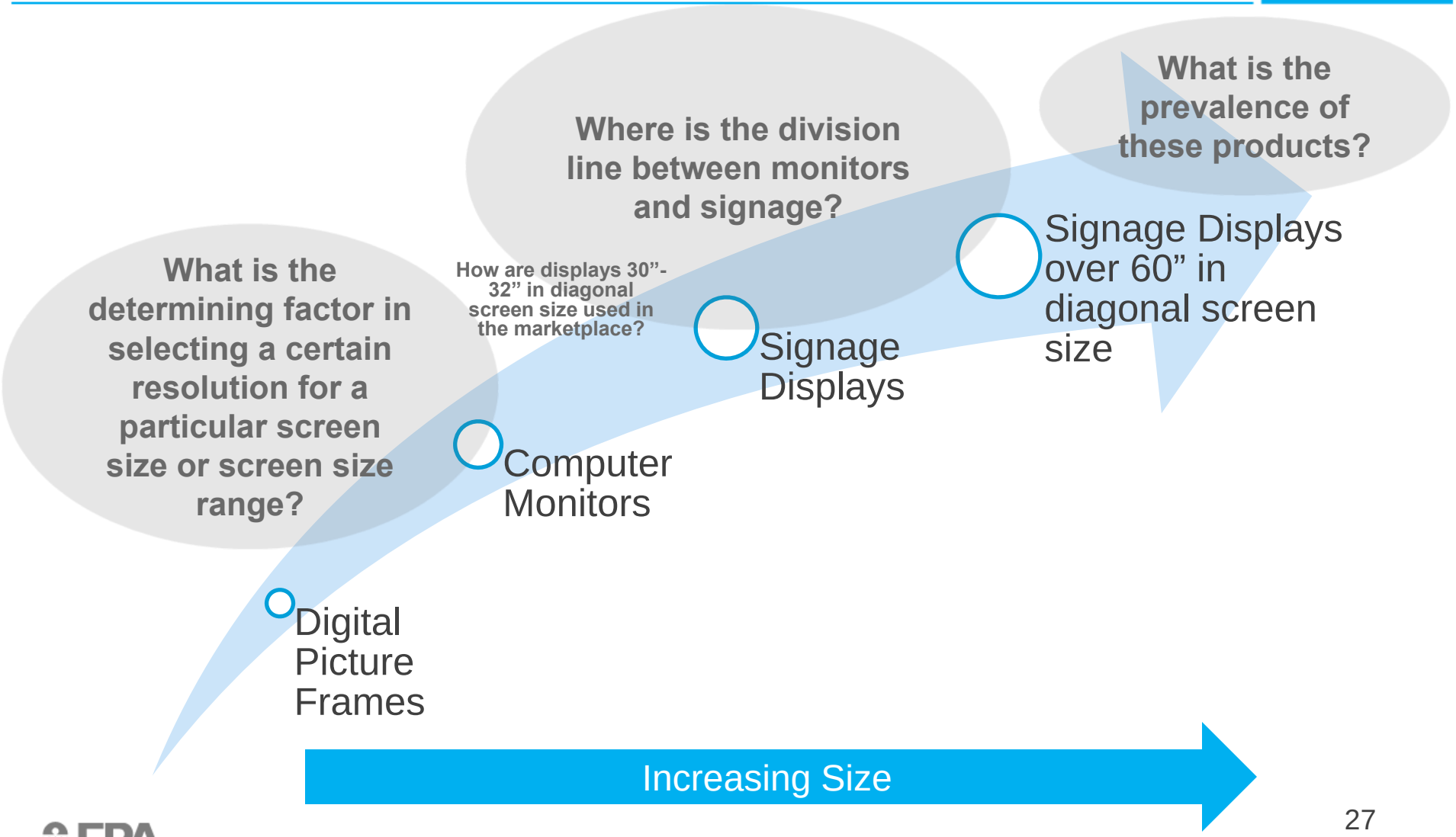
Scope

- EPA has clarified the scope of included and excluded products. Examples:
  - Inclusion of displays with KVM functionality
  - Exclusion of displays marketed and sold as dual function televisions/computer monitors.

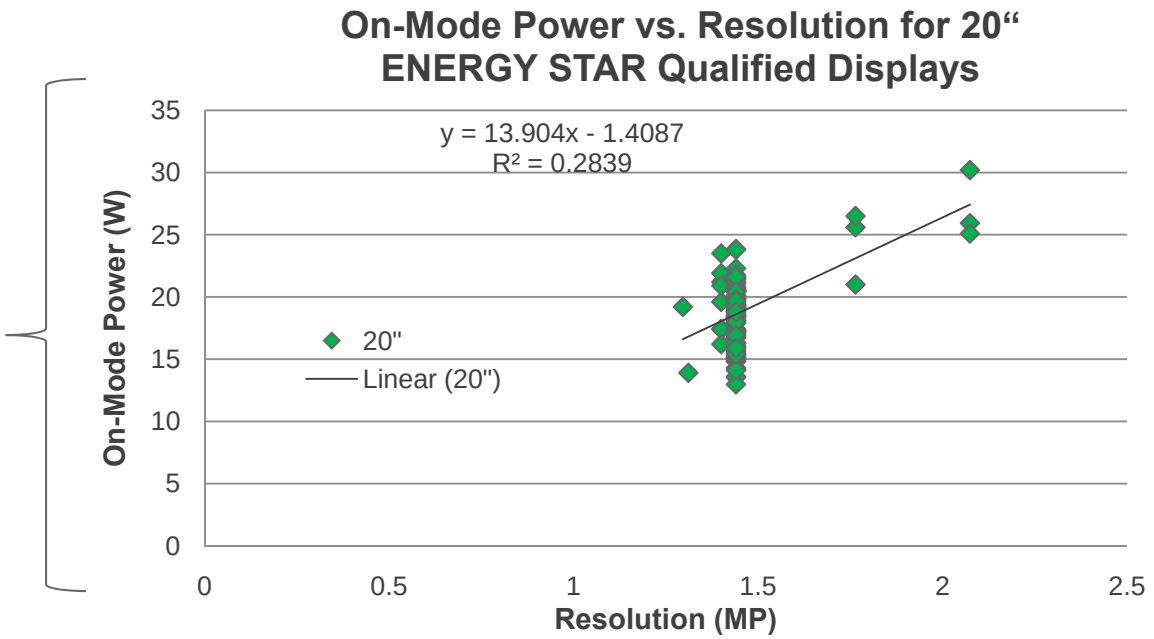
EPA welcomes stakeholder feedback on additional display product types that can be addressed in this specification and their associate characteristics, i.e., power consumption, market usage and typical functionality. Also, are larger sizes becoming more prevalent in the marketplace (i.e. 65”)?

Marketing of Display Products



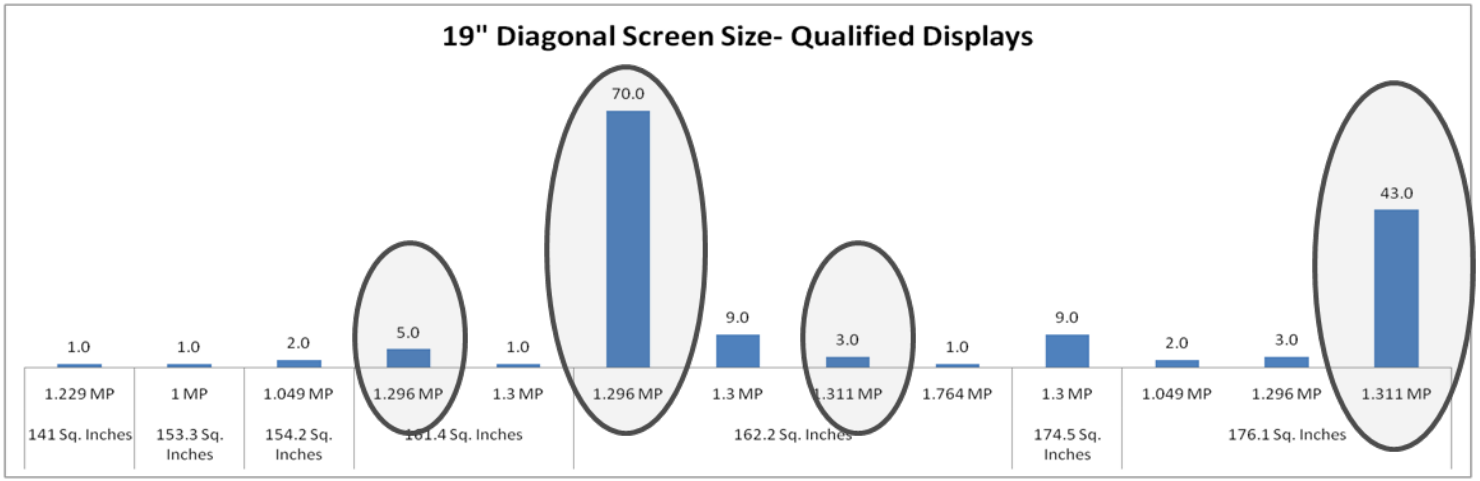
Display Resolution

What is the quantitative impact on power consumption from each mega-pixel increase in resolutions? Does this depend on screen size or pixel size?

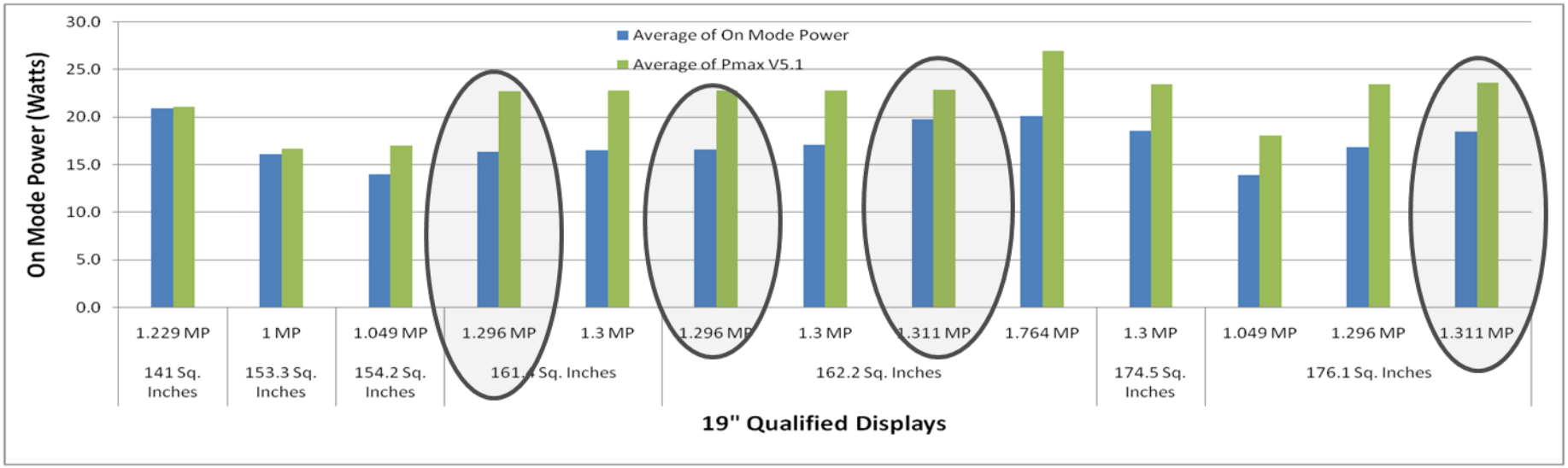


EPA continues to investigate the extent to which resolution has an impact in determining On Mode power consumption. In particular EPA is interested in evaluating how the amount of light transmitted through a display panel is affected by the pixel size and its relative resolution and whether the power consumption is affected by the test image resolution, particularly if it is not the native resolution of the display.

Typical Distribution of Resolution



1.296MP and 1.311 MP are the predominant resolutions for displays that qualified in 19" diagonal screen size qualified displays



On Mode Power

- Considering the significant proposed modifications to the specification and test method, EPA is not proposing On Mode power levels under this draft
- EPA is currently assembling data for determining On Mode power levels under Draft 2

Stakeholders are encouraged to test displays less than 30” in diagonal size using the IEC 62087, Ed.2.0 test method and to share the test data for EPA consideration.

In addition, EPA has limited data from its qualified product list for displays greater than 30” in diagonal size and seeks test data on non-qualified products.

Sleep and Off Mode Power

- To harmonize with the EU Ecodesign regulation (EC No. 1275/2008), EPA is proposing a maximum allowable power consumption of .5 Watts for both Sleep and Off Mode.
  - Over half of the ENERGY STAR qualified displays under 30” in diagonal screen size would be able to meet the proposed requirement for Sleep Mode; and over 80% would meet the requirement for Off Mode.

Sleep Mode	Off Mode
.5 Watt	.5 Watt

The ENERGY STAR team currently has limited data from its qualified product list for displays greater than 30” in diagonal screen size and seeks test data of non-qualified products for Sleep and Off Modes.

Multiple Sleep Modes

- EPA recognizes that some display products may have multiple Sleep Modes and seeks comment on:
  - The commonality and characteristics of these multiple Sleep Modes
  - The power consumption associated multiple sleep modes
  - Additional features that increase power consumption in Sleep Mode.
  - What determines which Sleep Modes are used?

Power Management

- EPA understands that manufacturers continue to develop and implement innovative power management functions involving new technologies.
  - Examples include occupancy sensors, proximity sensors or timer functions
- EPA encourages the broader use of power management technologies through this specification and welcomes industry to share any relevant information such as:
  - Prevalence in the market
  - Usage
  - Potential savings offering
  - Implications for test method

Conformance with proposed F-gas, toxicity and recyclability requirements

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Preventing Unintended Consequences

- As ENERGY STAR requirements become increasingly stringent, EPA is sensitive to need to guard against unintended increases in GHG emissions associated with manufacturing more efficient technologies.

- While LCDs have proven an effective means to delivering high performance with less energy, producing LCDs requires fluorinated gases (F-GHGs), among the GHGs with the highest global warming potentials.

- For Version 6.0, EPA is proposing to a new Partner Commitment for Display manufacturers, calling on them to source LCD components from suppliers who have demonstrated that they are reducing fluorinated GHG (F-GHGs) emissions in LCD production.
  - Leverages significant international work accomplished over the previous decade. This requirement was the foundation of the global LCD industry's voluntary commitment established in 2001 through the World LCD Industry Cooperation Committee (WLICC).
- **EPA is exploring the extent to which this requirement could be met through participation in existing initiatives, such as the WLICC, and welcomes stakeholder feedback. What other initiatives exist?**

Consumer Value

- In the interest of offering features consumers value, EPA expects to require ENERGY STAR qualified Displays to meet existing toxicity requirements and be recyclable (i.e. designed for ease of recycling; EPA will also explore including a requirement for recycled content).

- EPA commits to referencing existing standards already met by majority of industry stakeholders (ROHS, IEEE 1680).

- *Aim is not to create product differentiation around toxicity and recyclability requirements.*

- **In the interest of leveraging other efforts to reduce effort and cost to partners, EPA requests information on how manufacturers are currently conforming to existing standards specific to toxics in products or recycled content/design for recyclability of products.**

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Timeline and Next Steps

- June:
  - Receive comments on the Draft Test Method by June 21
  - Publish Test Method and Data Assembly Form by June 28
- July:
  - Receive comment on Draft 1 Specification by July 18
  - Assemble stakeholder test data by July 18
- August:
  - Publish Draft 2 Specification and Final Test Method
  - Receive comment on Draft 2 Specification and Final Test Method
- September:
  - Stakeholder in-person meeting and Webinar in early-mid September
- October:
  - Publish Draft 3 or Draft Final and Final Test Method
- November/early December:
  - Receive comment on revised Draft Specification and Final Test Method
  - Finalize Specification by early December

Outstanding questions?

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Thank you!