



# Comments about Energy Star 6.0 Draft2

27, Oct 2011



# Agenda

1. Message to EPA
2. Proposal for On mode
3. Datasets
4. LGD Contact Point

## Message to EPA

- **LG Display agrees EPA’s CHANGE THE WORLD for global environment and LG Display do best to step with Energy Star.**
- **‘On mode’ level of ES6.0 Draft2 would be premature in the market with plasma and liquid crystal display.**
- **LG Display suggests new equation for Draft3 of ES6.0 taking the circumstances into consideration.**

*< On mode equation for Draft3 >*

Product Type		P <sub>on_MAX</sub> Tier1(watts)
Diagonal Screen Size, <i>d</i> (inches)	Screen Resolution <i>r</i> (megapixels)	Where: <i>r</i> =Screen resolution in megapixels <i>A</i> = Viewable screen area, rounded to the nearest 0.1 square inches
<i>d</i> < 30.0	<i>r</i> ≤ 1.1	( 6.0 x <i>r</i> ) + ( 0.05 x <i>A</i> )
	<i>r</i> > 1.1	( 6.0 x <i>r</i> ) + ( 0.05 x <i>A</i> ) + 3.0
300 ≤ <i>d</i> ≤ 60.0	Any	( 0.27 x <i>A</i> ) + 8.0

- **On mode standard needs to be classified according to volume & performance of displays in the market.**

# Proposal for Draft3

1. It is most effective to strengthen On mode level of Energy Star gradually 20~25% per tier regarding current display business beset by price war and market saturation.
2. LG Display proposes new equation for On mode of draft3.

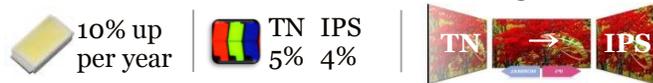
## The state of Displays market

### (1) Larger size & Higher resolution



### (2) Limitation of LCD technologies

- LED efficiency is increasing 10% per year.
- Panel transmittance reached saturation point
- Transition from TN to IPS for wide viewing



### (3) Functional display



### (4) The continuation of Price increase

- Product for ES6.0 Draft2 in LCD incur expenses in manufacturing and continuous price increase makes depressed market



## On mode equation for Draft3

Product Type		$P_{on\_MAX}$ Tier1(watts)
Diagonal Screen Size, $d$ (inches)	Screen Resolution, $r$ (megapixels)	Where: $r$ = Screen resolution in megapixels $A$ = Viewable screen area, rounded to the nearest 0.1 square inches
$d < 30.0$	$r \leq 1.1$	$(6.0 \times r) + (0.05 \times A)$
	$r > 1.1$	$(6.0 \times r) + (0.05 \times A) + 3.0$
$30.0 \leq d \leq 60.0$	Any	$(0.27 \times A) + 8.0$

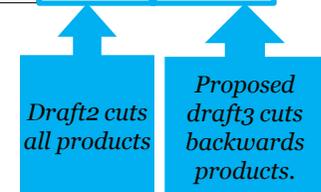
Display		ES5.0 On mode	ES6.0 On mode			
inches	resolution		Draft2 (watts)	vs ES5.0 (%)	Proposed Draft3 (watts)	vs ES5.0 (%)
18.5"	1366x768	16.61W	12.42W	-25.3%	13.61W	-22.0%
19"	1440x900	22.74W	14.12W	-37.9%	18.85W	-20.6%
22"	1680x1050	25.54W	14.93W	-41.5%	21.65W	-18.0%
19"	1280x1024	23.58W	14.41W	-38.9%	19.64W	-20.0%
20"	1600x900	24.51W	15.12W	-38.3%	20.19W	-21.4%
21.5"	1920x1080	31.54W	19.31W	-38.8%	25.32W	-24.6%
23"	1920x1080	32.96W	19.72W	-40.2%	26.74W	-23.3%
27"	1920x1080	37.19W	28.33W	-23.8%	30.97W	-20.1%

# Datasets

- Proposed draft3 of ES6.0 is appropriate to restrict current products as a standard and censor developing products reasonably.**

Display Product			On mode Requirement					Pre-test				
			ES5.0 (watts)	ES6.0		Proposed ES6.0		Watts in On <sup>5)</sup>	Result(OK/NG)			
				Draft 2 (Watts)	vs ES5.0 (%)	Proposed draft 3 (Watts)	vs ES5.0 (%)		under draft2	under proposed draft3		
Inches	Resolution											
Current <sup>1)</sup>			18.5"	1366x768	16.61	12.42	-25.3%	13.61	-22.0%	16.23	NG <sup>6)</sup>	NG <sup>7)</sup>
			19"	1440x900	22.74	14.12	-37.9%	18.85	-20.6%	20.20	NG	NG
			22"	1680x1050	25.54	14.93	-41.5%	21.65	-18.0%	23.08	NG	NG
Developing <sup>2)</sup>	Vertical LED Backlight <sup>3)</sup>	19"	1280x1024	23.58	14.41	-38.9%	19.64	-20.0%	18.74	NG	OK	
		20"	1600x900	24.51	15.12	-38.3%	20.19	-21.4%	17.29	NG	OK	
		21.5"	1920x1080	31.54	19.31	-38.8%	25.32	-24.6%	22.71	NG	OK	
		23"	1920x1080	32.96	19.72	-40.2%	26.74	-23.3%	23.59	NG	OK	
		27"	1920x1080	37.19	28.33	-23.8%	30.97	-20.1%	29.43	NG	OK	
	Horizontal LED Backlight <sup>4)</sup>	20"	1600x900	24.51	15.12	-38.3%	20.19	-21.4%	19.32	NG	OK	
		21.5"	1920x1080	31.54	19.31	-38.8%	25.32	-24.6%	24.50	NG	OK	
		23"	1920x1080	32.96	19.72	-40.2%	26.74	-23.3%	25.48	NG	OK	
		27"	1920x1080	37.19	28.33	-23.8%	30.97	-20.1%	34.04	NG	NG	

- 1) Current Product : Industrial display products under Energy Start 5.0 standard
- 2) Developing Product : New product for Energy Star 6.0 under development
- 3) Vertical LED Backlight : LED array as the light source of LCD arranged at the right side or left side in LCD module
- 4) Horizontal LED Backlight : LED array as the light source of LCD arranged at the top or bottom in LCD module
- 5) Watts in On : Total power consumption of LCD module and monitor set system.  
(watts = monitor set system(30% of ES6.0 Draft2 )+ power consumption of LCD module)
- 6) 16.23watts(Watts in on) > 12.42watts(ES6.0 Draft2) → NG
- 7) 16.23watts(Watts in on) > 13.61watts(Proposed ES6.0 Draft3) → NG



# Contact Point

***LG Display welcome the opportunity to discuss about display characteristic including power consumption considering Energy Star.  
Please let me know if you have any question.***

***Sarah So  
IT Product Planning Team  
LG Display Co., Ltd.  
(82) 10-7226-2931  
[smile113@lgdisplay.com](mailto:smile113@lgdisplay.com)  
[www.lgdisplay.com](http://www.lgdisplay.com)***



October 14, 2011

Ms. Verena Radulovic  
Product Labeling  
ENERGY STAR Program  
U.S. Environmental Protection Agency  
Via e-mail: [displays@energystar.gov](mailto:displays@energystar.gov)

**Re: ENERGY STAR Displays Draft 2 Version 6.0 Specification**

Dear Ms. Radulovic

Thank you for the opportunity to comment on the ENERGY STAR Displays Draft 2 Specification. LG Electronics, a long-time ENERGY STAR Partner, is pleased to submit these comments.

LG Electronics USA, Inc., based in Englewood Cliffs, NJ, is the North American subsidiary of LG Electronics, Inc., a global leader in home appliances, consumer electronics and mobile communications. In the United States, LG Electronics sells a range of stylish and innovative home appliances, LED lighting products, solar energy systems, home entertainment products, mobile phones and air conditioners. Founded in 1958, LG has been leading the way in bringing advanced technologies to our customers, and we aim to become recognized as the global leader in energy efficient products. As you know, LG is a long-time ENERGY STAR® partner, and more than 500 LG products currently available in the United States are ENERGY STAR® qualified.

**Three main topics we would like to provide comments to the Energy Star Display V6.0 draft 2.**

First, we believe that the requirement for on-mode limit is too strict. Compared to the previous V5.1 the limit is reduced by approximately 58%. After extensive evaluation, we are concerned that only a few models in the market will qualify for Energy Star. If our results are true, it is hard to believe that the limit in the draft was based on the top 15% of the market.

Second, regardless of the screen size, measurement of sleep mode could be done on HDMI or similar, based on the video on-mode measurement. Compared to D-sub, when measurement is calculated through HDMI than the energy consumption tends to increase. We recommend that the sleep mode requirements should follow V5.1 Tier 2 of 1W for V6.0.

Lastly, the CO2 emission should be based on the product's entire lifecycle. We believe that for the purpose of Energy Star, CO2 emission should not be measured separately by energy consumption, standby power, parts manufacturing and etc. CO2 emission requirements should be separated by years to provide a step by step process so manufacturers have enough time to prepare. For example, to reduce loss created from disturbance to the production line when reduction equipment needs to be installed and etc. Also, the reduction rate for F-Gas should be adjusted from 90% to 60%. Decomposition of F-gas causes significant amount of power and toxic gases which leads to frequent failure of major components,

premature aging, and cleaning due to clogging. For this reason running full operation is practically impossible considering periodic maintenance of equipment degradation for replacing, cleaning, degradation, and downtime. CO2 emission goals should be met by realistic levels.

Again, thank you for the opportunity to comment. We welcome the opportunity to discuss this matter further if you wish.

Cordially,



Jacob Gysik Cho  
Director, Product Regulatory Compliance  
LG Electronics USA, Inc.  
[gyusik.cho@lge.com](mailto:gyusik.cho@lge.com)

Additional Comments:

1. On-mode  
The on-mode limit requirement is too strict.  
Compared to V5.1 the limit is reduced by up to 58%.  
After evaluating our data with this limit there are only a few models that will qualify for Energy Star.  
This outcome makes it hard to believe that the limit was made stringent based on the top 15% of the market.
2. Sleep Mode  
Before, we measured sleep mode on RGB(D-sub) for 30" or smaller. However, based on the video on-mode measurement, regardless of screen size we are planning to measure sleep mode on HDMI or similar.  
Compared to D-sub, when we measure sleep mode on HDMI then the energy consumption tends to increase. We are de-labeling the Energy Star logo on some models because these models do not meet the V5.1 Tier 2(1W) requirements effective 10/30.  
Therefore, we recommend that the sleep mode should follow V5.1 Tier 2 (1W) for now.
3. Toxicity and Recyclability  
There needs to be more information on the procedure and process to make further analysis.