



NRDC Comments on EPA's April 2009 Draft Requirements for TVs – Version 3.1

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On behalf of NRDC and its more than 1.1 million members and e-activists, enclosed are our comments that provide our enthusiastic support for the EPA ENERGY STAR's proposed Tier 2 and Tier 3 requirements for new TVs.

Background – TVs consume just over 1% of all national electricity use. This has been growing due to the move towards bigger screen sizes and their increased hours of operation. In late 2008, EPA added the all important on mode to its ENERGY STAR requirements. The specification was not very stringent and within 6 months of its effective date, almost all models on the market meet the EPA requirements contained in Version 3.0. The specification has positively impacted the set up menus of new TVs by encouraging consumers to pick the home mode and not the much brighter and power consumptive retail or vivid mode. To their credit EPA is now seeking to appropriately increase the stringency of its specifications in an effort to continue to reduce the power used by new ENERGY STAR qualified TVs. The new levels will further encourage manufacturers to shift toward more efficient designs and components, and go beyond simply adjusting the brightness levels offered to the user.

NRDC Supports the Proposed Tiers 2 and 3 Levels – NRDC has reviewed the levels proposed by EPA in its April 16, 2009 draft and strongly supports them. Setting these levels will:

- *Maintain a technology-neutral, performance-based standard.* The proposed ENERGY STAR requirements will create a level playing field for all technologies to compete, whether they be LCD, plasma, rear projection, OLED or some technology that does not yet exist on the market today. The specification also establishes smooth, continuous performance requirements and eliminates the “lighting bolt” shape of the current ESTAR spec that became increasingly less stringent for larger TV sizes, and resulted in significant lost energy savings and the unintended consequence of promoting bigger, more energy consuming models.
- *Result in Meaningful Tier 2 and 3 Levels* – The proposed Tier 2 on mode level results in a qualification rate just under 25% of today's market. Establishing this level results in several benefits. First, the new, more stringent level allows utilities to once again provide

rebates for models that meet or exceed the proposed ESTAR levels. With today's market near 100% for ESTARV3.0 TVs, utilities are unable to justify rebates for models that simply meet ESTAR. Secondly, the Tier 2 level aligns with the proposed California Energy Commission's standard due to go into effect several years from today. Utility rebates offered in California and other states will help to "pave the way" for this future standard.

The Tier 3 level is forward looking and results in an estimated incremental savings of roughly 30% beyond Tier 2. We support EPA's decision to set this level now as it provides interested manufacturers with clear, advanced guidance and a specific "target" to base their new efficient designs on. Given the myriad of new models that were recently introduced that meet Tier 2, plus those that are in the pipeline, we can expect the ENERGY STAR qualification rate for Tier 2 to increase significantly over the next year or two. This provides further justification for limiting, in advance, the duration of Tier 2 and the establishment of a more stringent Tier 3. Interested utilities may also choose to establish tiered rebates that would include a more sizable incentive for models that meet Tier 3 prior to ENERGY STAR's Tier 3 effective date.

Given the high market penetration of ENERGY STAR version 3.0 TVs and the importance to promote the most efficient TVs on the market, we recommend that the Tier 2 level becomes effective as early as logistically possible and that Tier 3 becomes effective January 1, 2012.

During the April 24th stakeholder meeting, Panasonic Corporation proposed an alternate specification that would once again result in less stringent requirements for TVs with large screen sizes. We reject this proposal on face value as there is no evidence to support their contention that one can not readily produce larger TVs that meet the proposed levels. This proposal is particularly dangerous as many of the bigger TVs are the ones with the greatest hours of operation and annual energy use. For example, consumers who buy a 52 inch TV will likely use this as their main TV and big screen TVs are often found in hotel lobbies, fitness centers and bars, where they are frequently on for 10 plus hours per day. If ENERGY STAR adopted Panasonic's proposed line, a 52 inch TVs would be given an additional 62 watt power allowance compared to ENERGY STAR's proposed Tier 2 level. This will result in lost incremental cumulative savings of approximately 1,130 kWh per TV used in a home environment and 2,720 kWh for TVs used in commercial applications. This translates to approximately \$113 and \$272 in additional energy costs, respectfully, over the life of the new TV.¹

In Appendix A we provide more detailed information on the various methods that TV makers are using to produce highly efficient big screen TVs and projections of further advances to come

Consider Setting a "Progressive" Specification for On Mode – Ecos Consulting and researchers at Lawrence Berkeley National Laboratory have recently introduced the concept of setting progressive efficiency standards. Such specifications become increasingly more stringent

¹ Estimates are based on the following: 1) 10-year TV lifecycle; 2) typical usage of 5 hours per day in a home setting and 12 hours per day in a commercial settings; and 3) \$0.10/kWh electricity cost.

for very large models. This approach is needed if we are going to deliver the energy savings that will be needed to deliver significant reductions in global warming pollution. As we continue to shift to bigger homes, TVs, etc., we “give back” some of the potential overall savings that could be achieved. Setting a watts/in² metric does not deliver overall energy savings for a category unless consumers fail to buy the really big ones or the really big ones deliver even greater efficiency than smaller sized models.

As such, we encourage EPA ENERGY STAR to develop an alternate Tier 3 specification for stakeholder consideration that would become progressively more stringent for TVs greater than a certain size, say 47 inches. Otherwise those consumers who purchase a large new ENERGY STAR TV may achieve little to no energy savings compared to the current TV they are replacing.

Getting the Settings Right – During the development of ENERGY STAR V 3.0 for televisions, there was much discussion about the opportunity to lower TV energy use by simply providing users with a “forced menu” set up screen. If implemented properly this would result in users picking a standard or home mode setting. A very large percent of models that qualified for ESTAR V 3.0 did so by adopting this low to no cost approach.

Given the shift to considerably more stringent ENERGY STAR levels, pending mandatory state standards, and the likely growth of considerable utility rebates for more efficient TVs, manufacturers will have several reasons to dramatically lower the energy consumption of their new models. There is concern that some manufacturers might elect to pick overly dim picture levels in their home or standard setting as a means to achieve a very low on mode power level. This could cause consumer dissatisfaction and result in the consumer picking a brighter, more power consumptive operating mode. Under this scenario, much of the potential savings would only occur on paper.

During this specification setting process, EPA ENERGY STAR has led discussions on how best to minimize the likelihood of overly dim home settings. Various options were floated including options that are based on setting allowable ratios of the power or luminance between home and the brightest selectable modes. NRDC supports the direction EPA is taking on this issue. NRDC is still studying this somewhat complex issue and preliminarily offers the following proposal:

- Establish a minimum luminance ratio between home and retail mode of 65%. (Measured home luminance levels must be at least 65% of measured luminance at retail mode). This would provide harmonization with the recent specifications from the EU.
- EPA to work with industry and other interested stakeholders to develop a consensus test pattern and test method for measuring the luminance of the test pattern at the beginning of the on mode test. If consensus can not be reached by 12/31/09, EPA ENERGY STAR will establish one themselves. (The European approach uses a white screen for measuring initial luminance and to prevent gaming, a more complex, less gameable test pattern is desired.)

- Require manufacturers to report the on mode power levels and luminance levels for both retail and home/standard modes.
- EPA shall review the new data and have the ability to modify its approach on settings and brightness prior to the Tier 3 enactment date.
- In parallel to this process, the EPA shall conduct a study that more specifically assesses the Automatic Brightness Control (ABC) requirements to better determine if the current language should be modified prior to the Tier 3 enactment date. We want ENERGY STAR to encourage ABC in TVs but the EPA should also ensure that reported power consumption for TVs accurately models real-world conditions.

Data Acquisition Mode (DAM) – We appreciate EPA’s efforts to get ahead of the DAM mode issue. From NRDC’s point of view there really are three issues that conceivably need to be addressed:

- Limit amount of time TV is in DAM mode.
- Limit power consumed when in DAM mode.
- Ensure TV quickly goes back to low power standby mode after download is complete (or if TV is on at the end of the download, back to active mode.)

Unfortunately this is a relatively immature and potentially rapidly changing service, and little information is available. At a minimum, we urge EPA to establish a maximum allowable power level for when a TV is in DAM mode. Barring defensible data from the industry, a maximum level of 5W seems appropriate. EPA should also continue to study this field to better understand whether most TVs that are connected to pay TV in the future have a separate set top box, use a cable card or have a built in set top box and how these implementations impact DAM power and energy use. Upon analyzing this information, EPA should modify the DAM requirements prior to the Tier 3 effective date.

Improved Clarity of ENERGY STAR Specification Names – As EPA is speeding up the frequency of spec changes under its ENERGY STAR program, which we support, we think additional attention is needed on how to “name” each of the respective spec levels. In addition, utility rebate programs are likely to base their rebates off these levels. As currently proposed, the current ENERGY STAR spec is currently referred to as Version 3.0 or V 3.0 for short. In the future, ENERGY STAR is moving to Version 3.1 which has two Tiers, called Tier 2 and Tier 3. This nomenclature could prove potentially confusing (eg V 3.1 Tier 1).

We encourage EPA to consider a simpler nomenclature to identify each of these quite different spec levels. For simplicity, it might make more sense to simply refer to each of the next two levels as Version 4 and Version 5, or Version 3.1 and Version 3.2.

APPENDIX A

As of May 15, 2009, 815 TVs were on the ENERGY STAR TV list that is available for download on the ENERGY STAR website. Almost a quarter of the TVs (198 out of 815) already meet the proposed Tier 2 levels. The brands and models that meet Tier 2 are shown in the figure below. Twenty-four brands are represented and many of the major brands have multiple TVs at different size categories that meet Tier 2 levels.

TVs that Meet Tier 2 as of May 15, 2009 (198 TVs: Brand and Model shown)								
Samsung	Toshiba	JVC	LG	Insignia	ViewSonic	AOC	Sansui	RCA
HL61A510J1F	15LV505	LT-19A200	19LF10-UA	NS-LCD15-09MX	VS12114-1M	L16W831	HDLCDVD225	L19HD41
HL61A650C1F	15LV506	LT-19D200	19LH20-UA	NS-LCD19-09MX	VS12115-2M	L19W831	HDLCD1912	L22HD31
HL61A750A1F	19AV500U	LT19-D200	19LH2000-ZA	NS-LCD15-09	VS12247-1M	L19W861	HDLCD1955	L22HD41
HL67A510J1F	19AV501U	LT-32EM20	19LU4000-ZB	NS-L19Q-10A	VS12247-1M	L19W898	HDLCD1955A	L52FHD38
HL67A750A1F	19AV51U	LT-42EM59	19LU5000-ZA	NS-L19W1Q-10A	VS12116-2M	L22W831	HDLCD2212	
HL72A650C1F	19AV600U	LT-42P789	22LF10-UA	NS-L19W2Q-10A	VS11858-2M	L22W861	HDLCDVD195	Sharp
HL-T5656W	19LV505	LT-42SL89VA	22LH2000-ZA	NS-L19X-10A	VS11859-2M	L22W898		LC19DV24U
HL-T7288W	19LV506	LT-42WX70	22LH20D-AA	NS-L22Q-10A	VS12335-1M	L24H898	VIZIO	LC22DV24U
LN19A330J1D	19LV50KW	LT-42X579	22LH20-UA	NS-LCD15-09CA	VS12335-2M		VA19LHDTV10T	LC22SB24U
LN19A330J1H	19LV610C	LT-46J300	22LU4000-ZB	NS-LCD19-09		Sony	VA22LFHDTV10T	
LN19A331J1D	19LV610U	LT-46P300	22LU5000-ZA	NS-LCD22-09	Sylvania	KDL-19M4000	VO22LFHDTV10A	Tatung
LN19A450C1D	19LV611U	LT-46SL89	37LH35FD-AA	NS-LCD22-09CN	LC195SL9 A	KDL-22L4000	VW22L HDTV10T	V19ZMCS-UWA
LN19A451C1D	19LV61K	LT-47EM59	42LH35FD-AA	NS-LDVD19Q-10A	LC195SL9 C	KDL-40VE5	VW46L FHDTV20A	V22ZMCS-UWA
LN19A650A1D	19LV61KW	LT-47P789	42LH90-UB		LC225SL9	KDL-46VE5		
LN19B360C5Di ½	22AV500U	LT-47X579		Emerson	LC321SS9	KDL-52VE5	Dynex	Clarity
LN19B650T6D	22AV600U	LT-47X899		LD195EM8 2	LC321SS9 A	KDL-52W4000	DX-L15-10A	CLLX
LN22A330J1D	22AV60U	LT-52P789		LC195EM9 E	LC321SS9 B	XEL-1	DX-L15-10C	CLRIO
LN22A450C1D	22LV505	LT-52X579		CLC321EM9	LD195SL8 A*		DX-L19-10A	
LN22A450C1H	22LV506	LT-52X899		LC321EM9	LD195SSX	Polaroid	DX-L22-10A	BenQ
LN22A451C1D	22LV50K			LC321EM9 A		1521-TLUB	DX-LCD19-09	SE22**
LN22A650A1D	22LV610U			LC321EM9 B	Mitsubishi	1921-TDUB		
LN22B360C5D	22LV611U			LC321EM9 D	WD-65737	TLA-01515B	MAGNAVOX	Haier
LN22B460B2Di ½	22LV61K			LC321EM9 E	WD-65837	TLA-01915B	19MD359B	L19W2Q-10A
LN22B650T6D	22LV61KW			LC195EMX	WD-65C9	TLX-01511C	22MF339B	
LN32B350F1Di ½	32AV502R			LD195EMX	WD-73737	TLX-01911C	19MD359B	Sanyo
LN37B457C6Hi ½	32AV52R				WD-73837		19MD358B/F7	DP19649
LN55B650T1F	37AV502R				WD-73C9		19MF338B/F7	
UN40B7000WF	37AV52R				WD-82737			Philips
UN46B7000WF	55SV670U				WD-82837			19PFL3403D/F7
UN55B7000WF								
UN55B7100WF								

It is also notable that some manufacturing representatives have cautioned the EPA against using information presented at trade shows like the Consumer Electronics Show (CES) or from manufacturer press releases. While we acknowledge that some of the models shown at the show are prototypes that may not be commercialized in the future, the vast majority of models introduced at these shows have since been successfully launched in the US market. For example, Sony prominently displayed new models at the January 2009 CES show that deliver 40% on mode power savings which was achieved in large part through the adoption of new more efficient back lights called HCFLs. Below is a photo from the CES show followed by a screen shot from Sony's website touting the availability of their new Eco Bravia VE5 series. These models include state of the art features and are available in 40, 46 and 52 inches.

Sony's BRAVIA VE5 series



→ **2009 model**

KDL-40VE5 (~100W, 40% reduction)

→ **2008 model**

KDL-40VS100 (~166W)

Sony Eco BRAVIA VE5 Series Promoted on Their Website

New BRAVIA® HDTVs coming Spring 2009.

2009 VE5 Series

Boasting super energy efficient features, the BRAVIA VE5 Series makes other TVs green with envy. The first hybrid HDTVs from Sony sport the same Full HD 1080p resolution and Motionflow 120Hz technology as the new V Series models, but they also incorporate newly developed features that reduce power consumption.

Highlights:

- ♦ High-efficiency HCFL backlight
- ♦ Presence Sensor
- ♦ Energy saving switch
- ♦ Exceeds Energy Star® 3.0 requirements
- ♦ BRAVIA Engine 2

NOTIFY ME 



Available sizes:

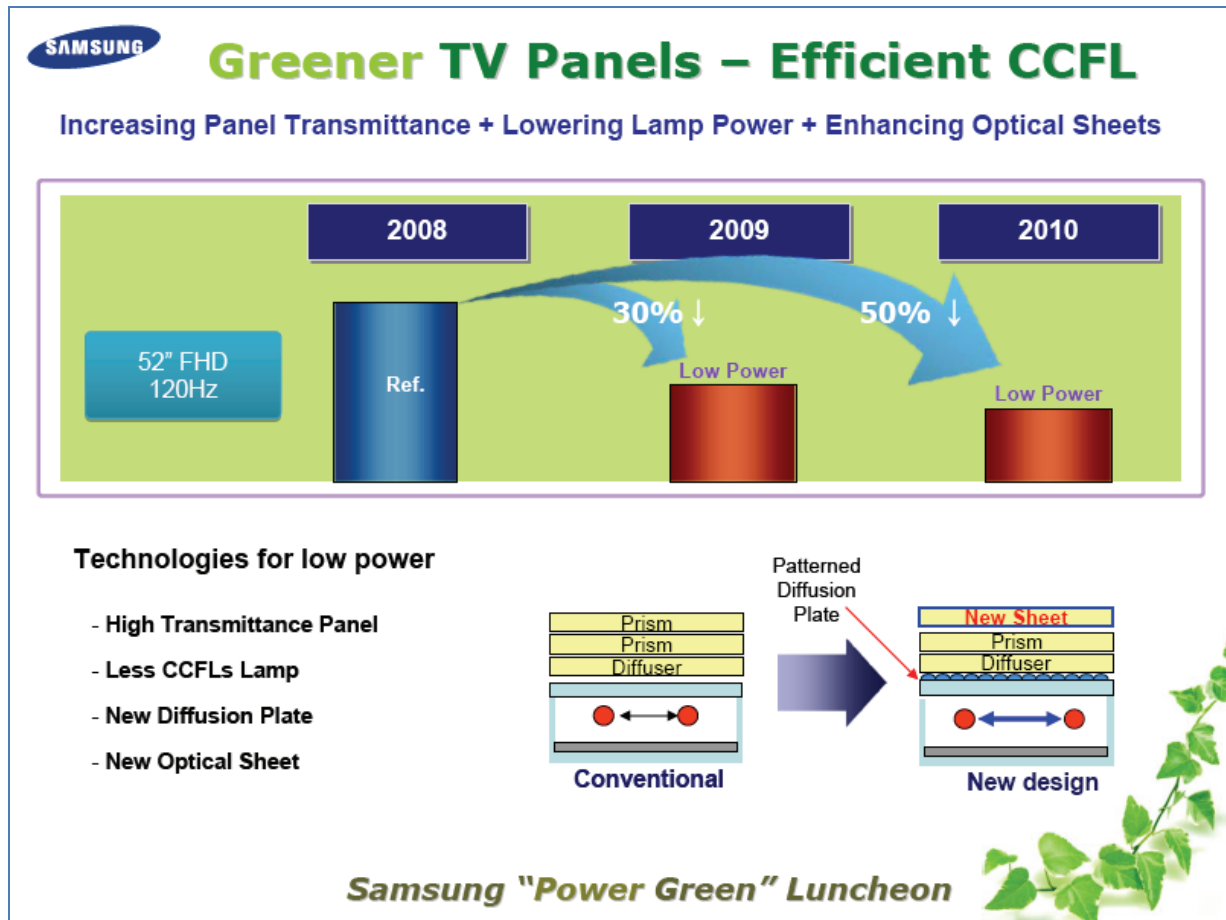
40 46 52

<http://www.sonystyle.com/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10551&storeId=10151&langId=-1&categoryId=8198552921644539863>

Samsung, which typically holds the #1 or 2 market share position for flat panel TVs sold in the US, has recently presented new encouraging efficiency developments for their LCD TVs with both CCFL and LED backlights.² The first slide below shows 30% power reductions in 2009 and 50% reductions in 2010, compared to a 2008 52" Full HD 120 Hz TV. This will be achieved by utilizing "Greener TV Panels" that increase panel transmittance, lower lamp power, and utilizing enhanced optical sheets. This is an example of the type of "eco-panels" that each of the large independent panel makers such as AUO, LDG and CMO are capable of producing. The second Samsung slide shows even further power reductions for LCD TVs that use LED backlights. Samsung estimates 30% power reductions for direct-lit LED TVs and 50%

² See http://www.samsung.com/us/business/semiconductor/news/downloads/Green_Media_Event_SBirnbaum.pdf for March 26, 2009 presentation by Scott Birnbaum, Vice President, Samsung LCD Division.

reductions for edge-lit LED TVs (compared to LCDs with CCFLs). These power reductions have been already been realized in at least four Samsung LED TVs that exceed Tier 2 levels. (See the Samsung TVs shown in the Tier 2 list above with models numbers that start with “UN”. The LED TVs are available in 40”, 46”, and 55” models). Once again, these models were first shown at the CES show and a few months later are now commercially available.





Greener TV Panels – Edge-lit



	Direct-lit	Edge-lit
Resolution	1080p	1080p
Thickness	49.5mm	10.8mm
Weight	25kg	15.5kg
Brightness	450nit	450nit
Power	30% ↓ (Less than CCFL)	50% ↓ (Less than CCFL)

- Thinner
- Less Power



Samsung "Power Green" Luncheon

These are just two examples of leading TV companies that already provide large screen TVs capable of meeting the proposed Tier 2 levels. **While some companies today do not yet offer efficient models in their larger offerings, there is no technical reason preventing them from doing so.** We fully expect other TV manufacturers to continue to innovate and bring more efficient models to the market, many of which meet or exceed the proposed new ENERGY STAR levels. In addition, we fully expect LED backlight technology to continue to improve over time.

While the LED backlights are first being introduced in the high end, larger TVs, we expect the incremental cost for LED technology to continue to decline and for it to be included in smaller models over time. As such, we need to take exception with a statement made by Panasonic at the April 24, 2009 stakeholder meeting that “prohibitively expensive LED LCD and OLED TVs should not be factored into dataset”.³ Many LED market signals indicate that rapid cost reductions and production increases are coming. For example, DisplaySearch recently released their [*Quarterly LED Backlight Panel Shipment & Forecast Report*](#) and listed the following as early evidence pointing to faster than expected growth:⁴

³ See slide 8:

http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/tv_vcr/Panasonic_Presentation.pdf

⁴ LED TV to Soar? By David Hsieh, Vice President, Greater China Market, DisplaySearch. May 18, 2009. <http://www.displaysearchblog.com/2009/05/led-tv-to-soar/#more-560>

- Sharp decided that their 37"+ LCD TVs will be 100% LED backlit by Q4'10.
- Samsung's TFT LCD division is aiming to ship 3 million LED TV panels this year, which is about 15% of their total 2009 target. We also heard that they are targeting 40-50% in 2010.
- From a major LCD TV panel maker, we learned that they have reduced the cost gap between 42" LCD TVs with CCFL backlights and LED backlights to \$100.
- The Philips target is to equip 50% of their LCD TVs with LED backlights in 2010. Because of this target, the capability of LED backlight management has become an important factor for Philips to consider as they select OEMs/ODMs for their 2010 outsourcing.
- One panel maker believes that their 42" LED backlight cost will be only 1.5X CCFL backlight by the end of 2009, down from 2X currently.
- Roadmaps for Samsung, LGD, AUO, and CMO (the top four LCD TV panel suppliers) show LED TV in all 32"+ series going forward.

In terms of plasma TVs, which today represent less than 15% of the market, companies like Panasonic, LG and Samsung have been aggressively working to reduce the on mode power use of their models. In 2008, Panasonic announced their "double efficiency" models at the January 2008 Consumer Electronics Show and those models are starting to enter the market now. They also announced "triple efficiency" plasma panels at the January 2009 Consumer Electronics Show (see figure below). The triple efficiency models are targeted to use 3 times less power than prior models while delivering the same brightness levels. With appropriate designs, these models should be able to achieve the proposed Tier 2 levels.

Next Generation Plasma TVs



Panasonic announced “triple efficiency” plasma TVs at the 2009 Consumer Electronics Show (see photos and press release below).

The “double efficiency” models were showcased at the 2008 CES. Some are available now and others will be introduced throughout 2009.



“The newly developed NeoPDP technology has been incorporated into two types of PDPs. The first is a super high-efficiency 42-inch PDP that achieves triple luminance efficiency, while reducing the power consumption to 1/3 of the 2007 models yet achieving the same brightness.” —Panasonic 2009 CEA Press Release

Full Press Release: <http://panasonic.co.jp/corp/news/official.data/data.dir/en090108-8/en090108-8.html>