



Overview of Draft 2 Version 3.0 TV Products Specification

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Presentation Overview



- Description of key definition changes in Draft 2
 - Definitions
 - TV Monitors
- Key issues raised by stakeholders and explanation of Draft 2 response
 - Resolution
 - On Mode Adders for Combo Units
 - Adders for Picture Quality Features
- Review of new data that informed Draft 2
- Description of additional key changes in Draft 2
 - Test Procedure Clarifications
 - Inclusion of Tier 2 requirements
- Projected savings from Draft 2



Description of Key Definition Changes in Draft 2

Definition Changes



- Minor edits to several definitions, as suggested by stakeholders:
 - All TV combination types combined under one broad category
 - Electronic Program Guide clarified
 - Standby Level modified to more closely follow IEC 62301
 - Download Acquisition Mode modified to include increased functions
 - Off Mode definition removed

TV Monitors



- Definition modified, per CEA's request, to more closely align with Version 2.2 specification's definition of a TV monitor
- Includes requirement that TV monitors must incorporate Display Power Management Signaling
 - Ensures that customers who choose to buy a TV monitor and use it with a computer will still benefit from power management savings



Key Issues Raised by Stakeholders and Explanation of Draft 2 Response

Summary of On Mode Technical Issues Raised by Industry



1. Resolution
2. On Mode adders for combination devices such as built-in DVRs, DVD players, etc.
3. LCD picture quality features such as wide color gamut and motion blur reduction

Issue 1: Resolution



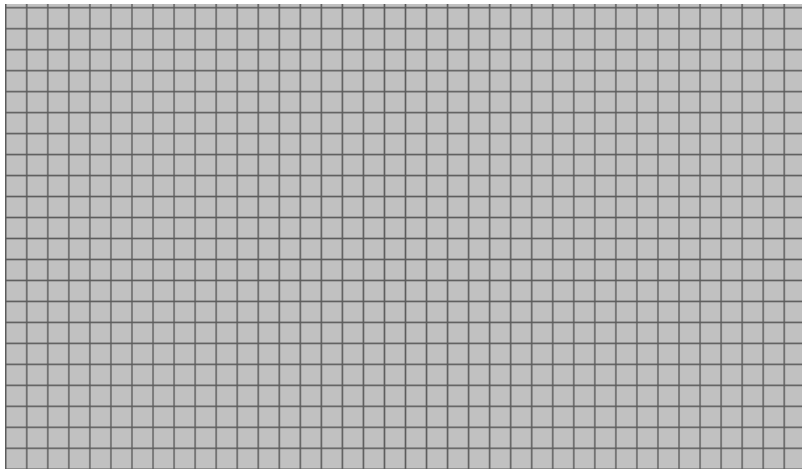
Stakeholder comment summary:

- Full HD or 1080p displays will raise On Mode consumption requirements for HDTVs, both plasma and LCD
- Draft 1 spec was easier for low resolution displays (e.g. 480i/p) to pass

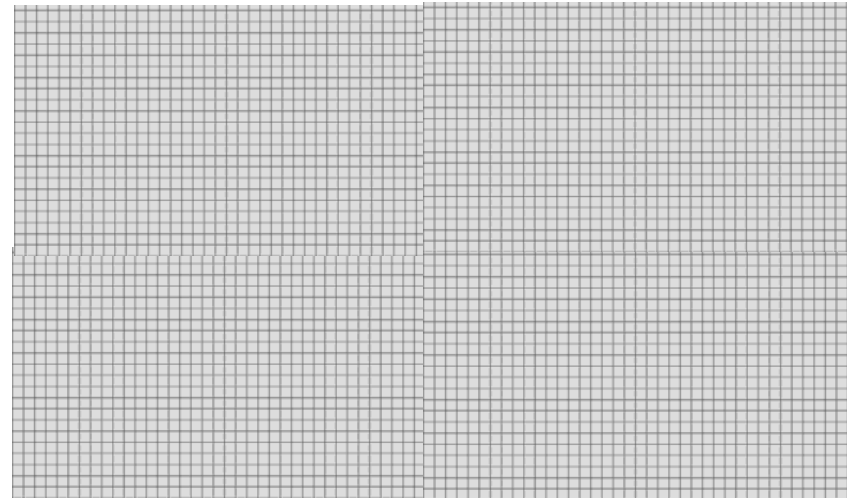
More Power Required to Achieve Same Brightness in 1080P Flat Panel Displays



720p



1080p



- More power may be required to achieve comparable brightness in a 1080P flat panel display
- Native resolution — not input resolution capability — drives this effect

Draft 2 Response: Resolution Bin Approach



Resolution Bin Name	Resolution Bin Limits	Spec Equation
Standard Definition	≤ 480 vertical lines	$P_{Max} = 0.13 * A + 25$
High Definition	> 480 and ≤ 768 lines	$P_{Max} = 0.20 * A + 40$
Full High Definition	> 768 lines; ≤ 650 in ² > 768 lines; > 650 in ²	$P_{Max} = 0.20 * A + 40$ $P_{Max} = 0.24 * A + 14$

Issue 2: On Mode Adders for Combination Devices Such as TV-DVRs, TV-DVDs, etc.



Stakeholder comment summary:

- DVRs, DVD players, and other secondary devices found in TV combination devices consume additional power in On Mode

Draft 2 Response:

- If user has not actively chosen to record or play back content with these devices, they should only be consuming a minimal amount of power, which is low in comparison to On Mode power consumption of the display itself
- Small amount of data on combo products in dataset suggest that these reflect minimal share of the market

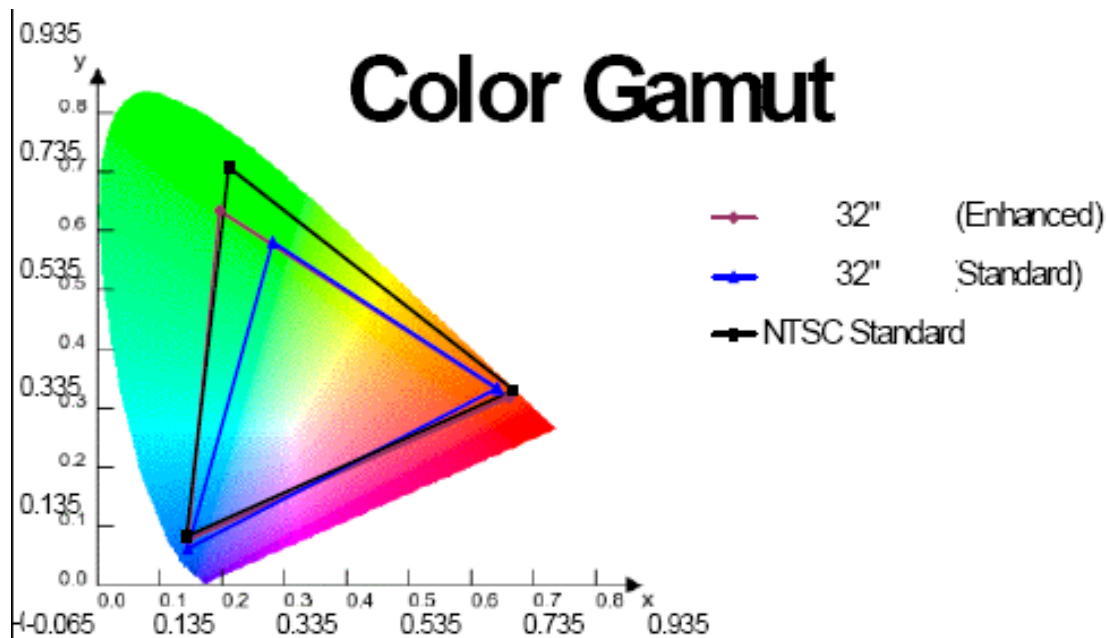
Issue 3: LCD Picture Quality Features



Stakeholder comment summary:

- Features such as wide color gamut backlighting and motion blur reduction result in higher On Mode power consumption in LCD TVs
- The ENERGY STAR team should consider On Mode adders for these features that provide additional functionality to the consumer while consuming more power

Wide Color Gamut in LCDs



- Data presented from LCD stakeholders suggest that wide color gamut CCLFs ~20% less efficient than standard bulbs
- Does NOT translate into 20% increase in On Mode power
- Wide color gamut expected to be available in 40% of LCD TVs >30\" in 2008 (DisplaySearch data) and cannot be considered a premium feature

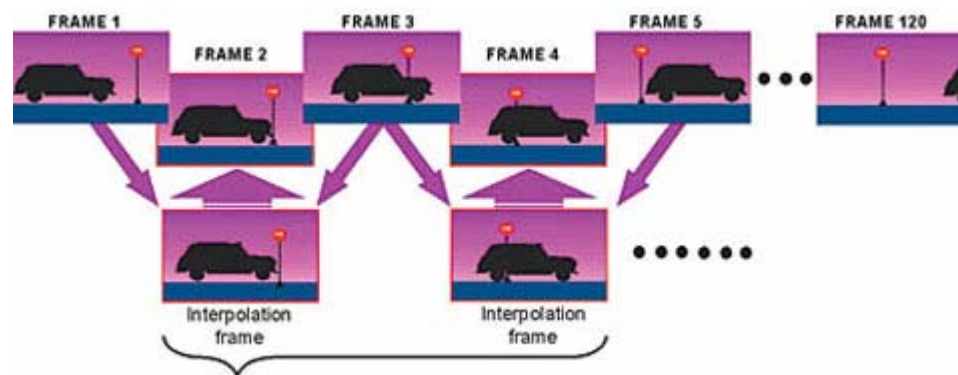
Anti-Blur Techniques in LCDs



120 Hz switching with dark frames



120 Hz switching with interpolated frames



Feature is beginning to gain traction in higher end displays and expected to become more mainstream during the life of the specification

Represents <5% increase in On Mode power that can be overcome through improved optics

Draft 2 Solution: No Adders for These LCD-Specific Features



- Wide color gamut and 120 Hz anti-blur technology will become much more prevalent during the course of this specification
- As such, these technologies can be considered part of the inherent “overhead” associated with powering an LCD display
- In keeping with the technology neutral approach, EPA believes it would be inconsistent to grant adders for a feature to improve the picture for only one type of TV (i.e. LCDs)



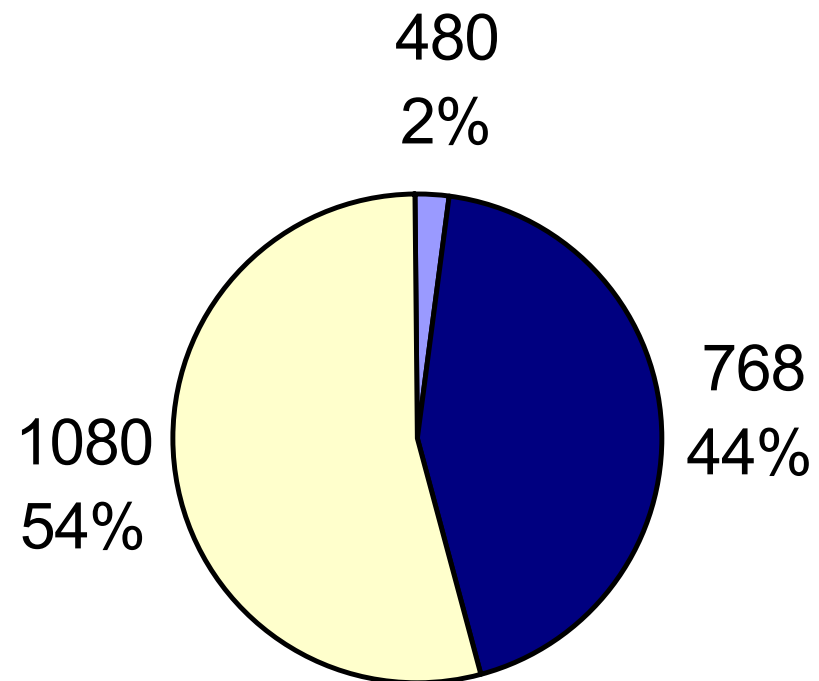
Review of New Data that Informed Draft 2

New Data for Draft 2



New Data by Resolution

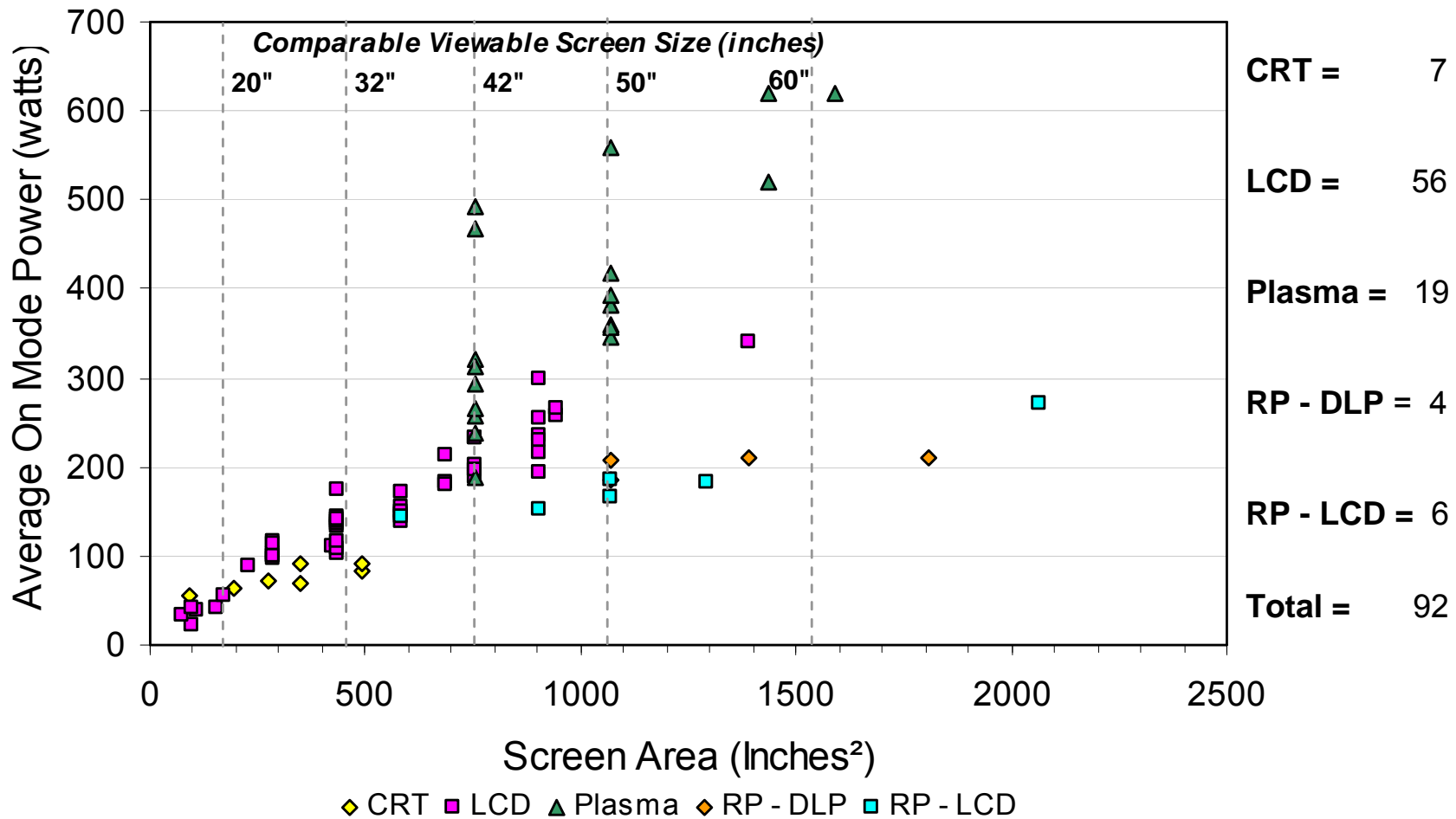
- Draft 2 dataset includes 151 models
- 95 new data points collected for dataset
 - About 85% of new data is for TVs with screen sizes > 32"
 - 54% 1080 resolution
 - 44% 768 resolution
 - 2% 480 resolution



Data Used for Draft 1



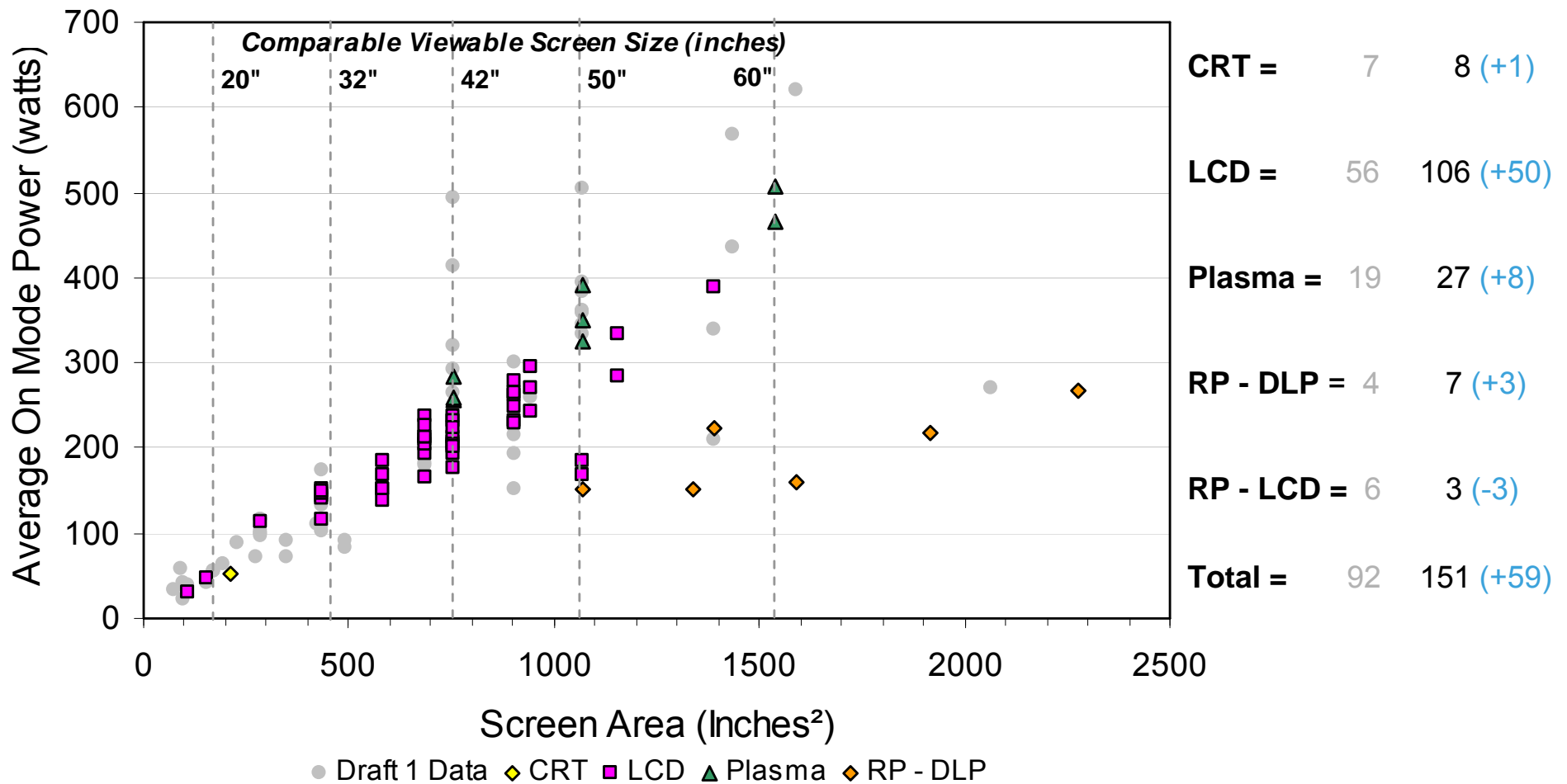
TV On Mode Power By Type - Draft 1



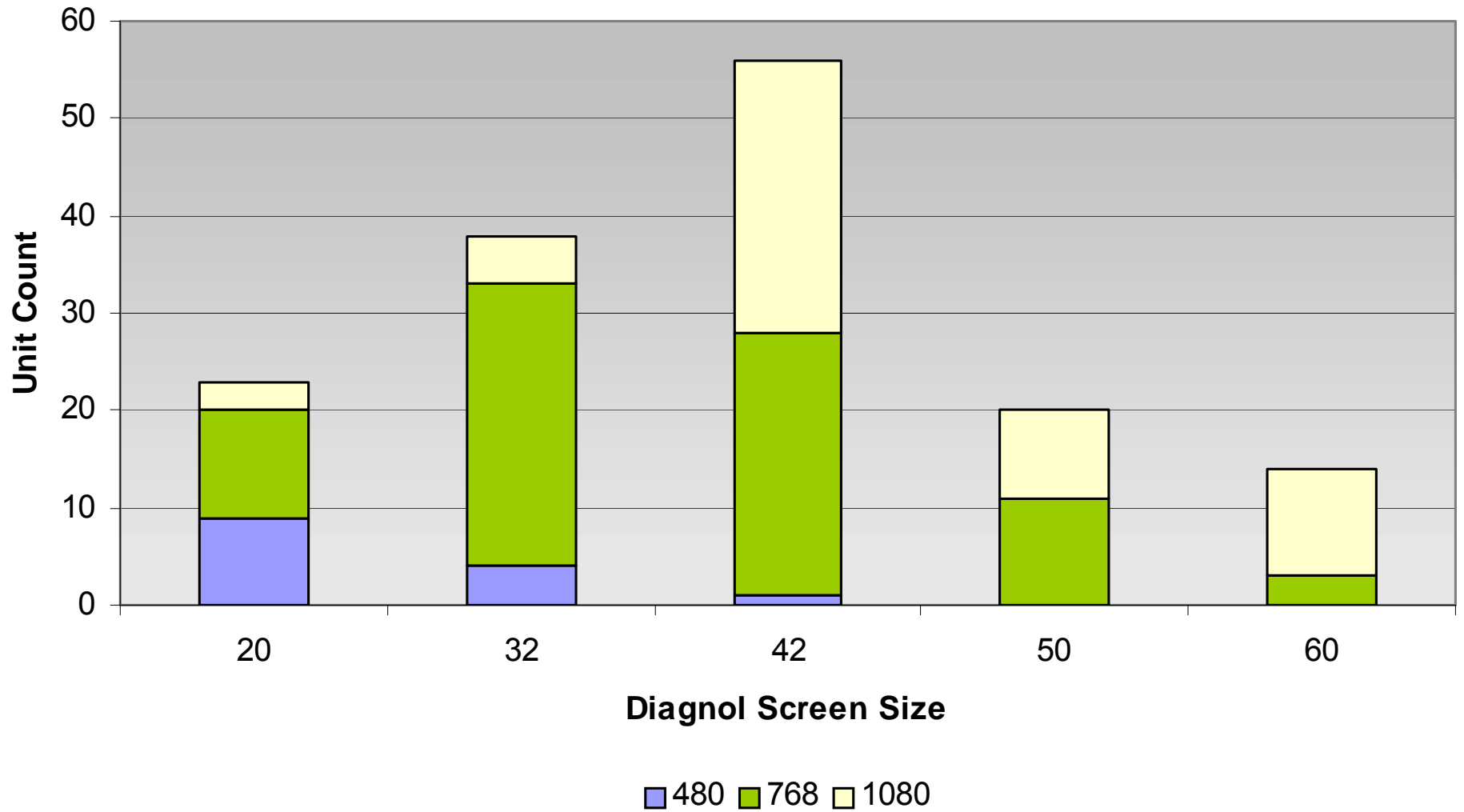
New Data for Draft 2



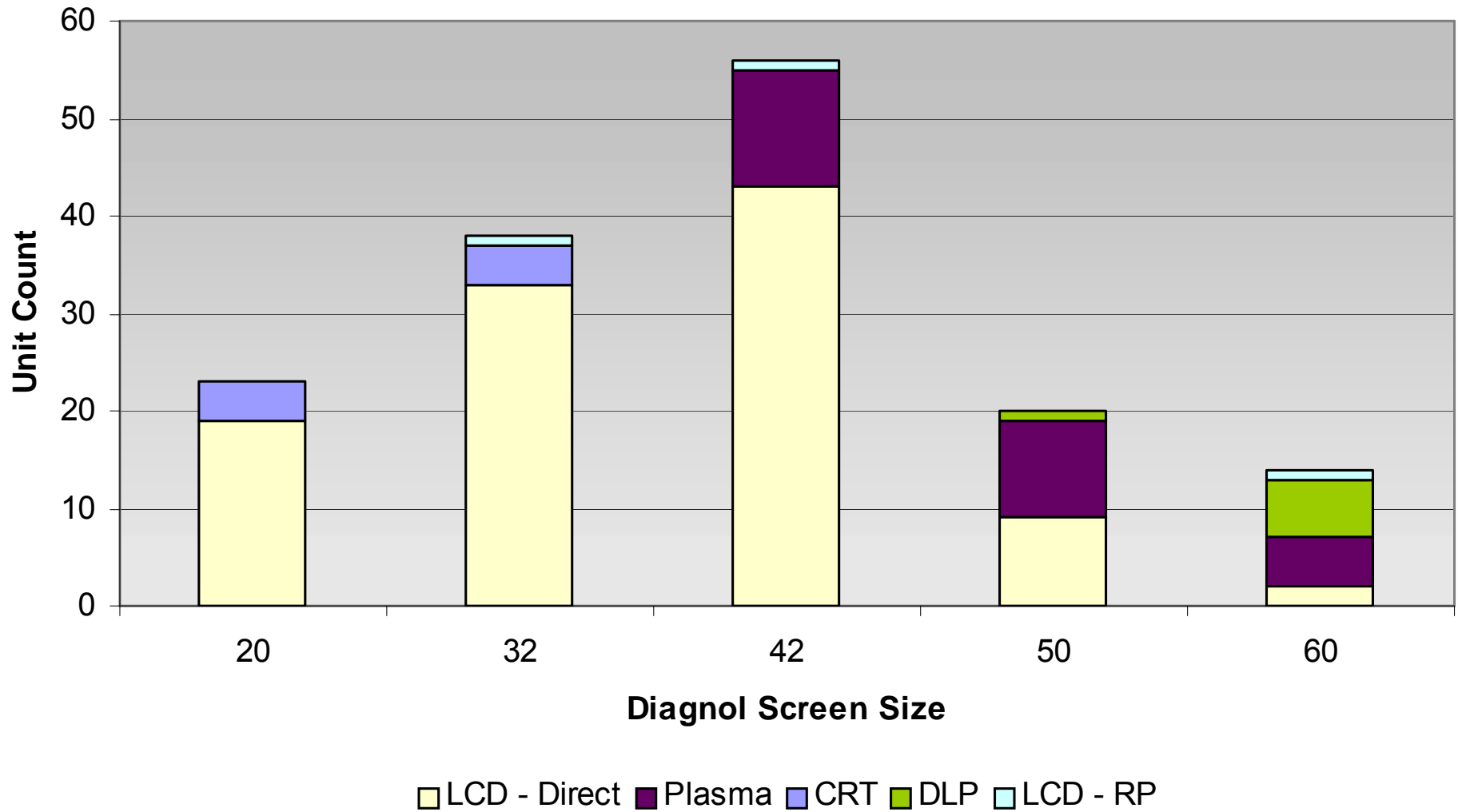
TV On Mode Power By Type - Draft 2



Distribution by Screen Size and Resolution



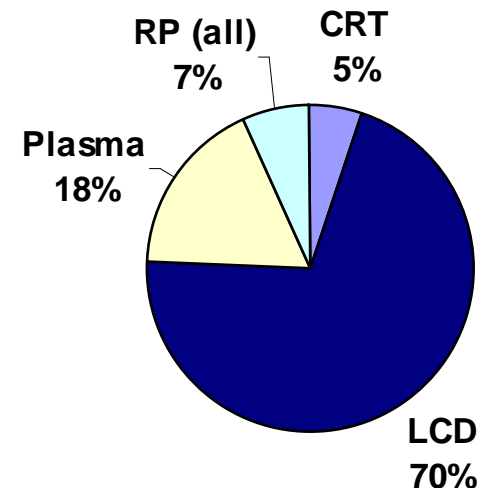
Distribution by Screen Size and Technology



Draft 2 Data Market Share



	Draft 2 (Units)	Draft 2 (%)	2008 CEA Projections
CRT	8	5.3 %	6.2 %
LCD	106	70.2 %	73.9 %
Plasma	27	17.9%	14.6 %
RP (All)	10	6.6%	5.3 %

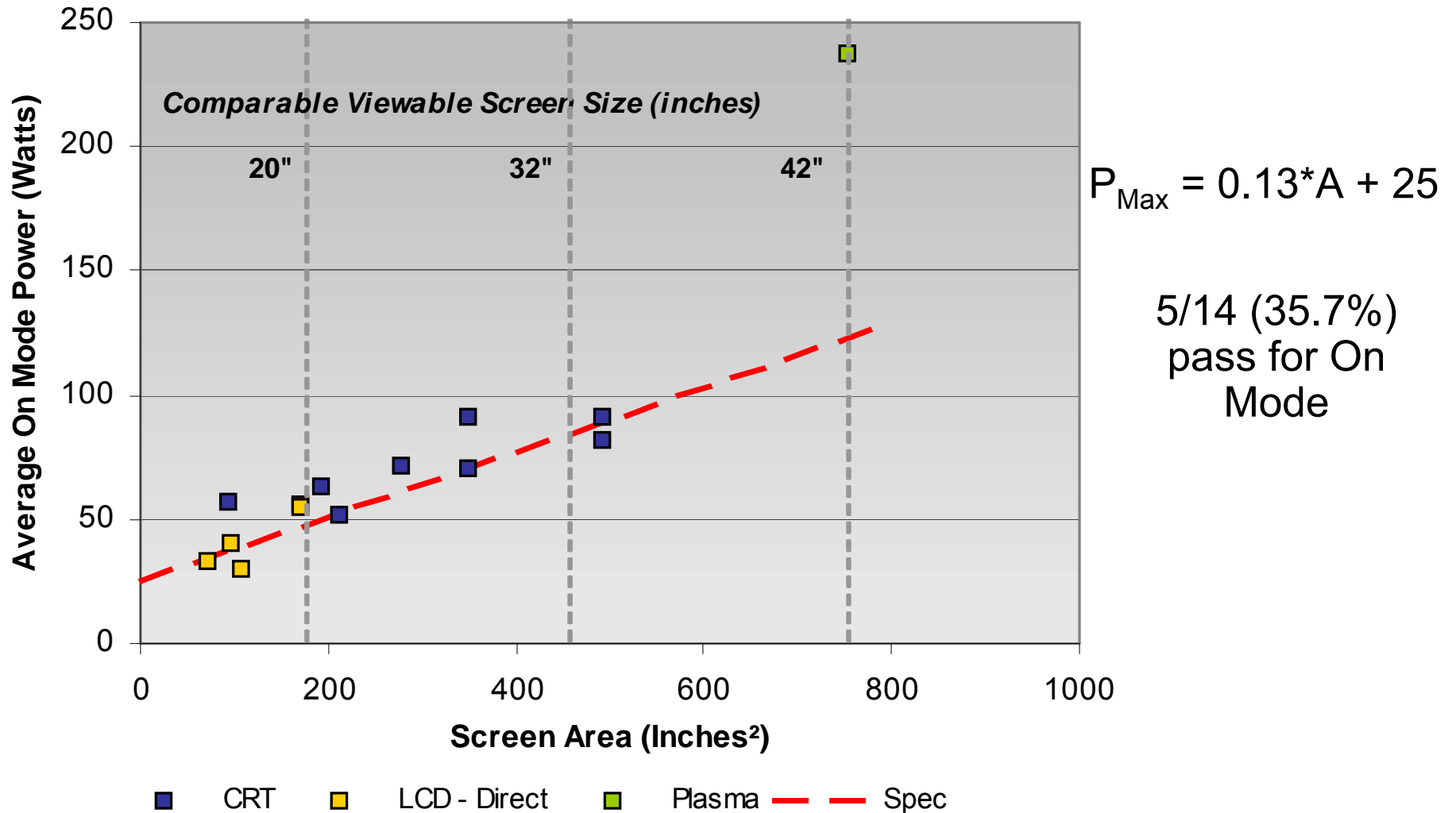


- Dataset analyzed to make sure different technologies are fairly represented in Draft 2
- 10 Rear Projection (RP) TVs removed to balance distribution

Draft 2 Specification Line: 480 Resolution



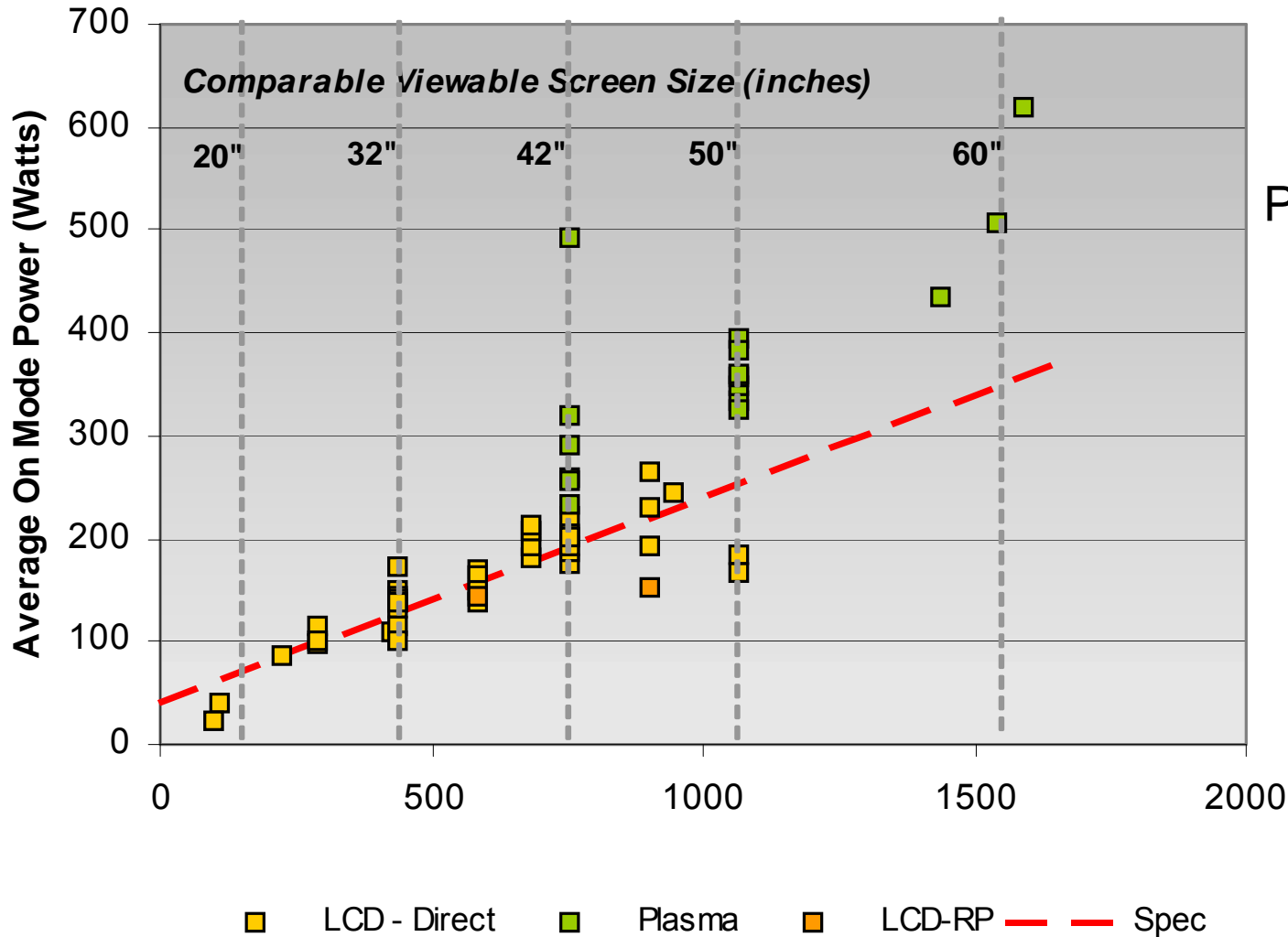
Average On Mode Power for 768 Lines of Resolution



Draft 2 Specification Line: 768 Resolution



Average On Mode Power for 768 Lines of Resolution



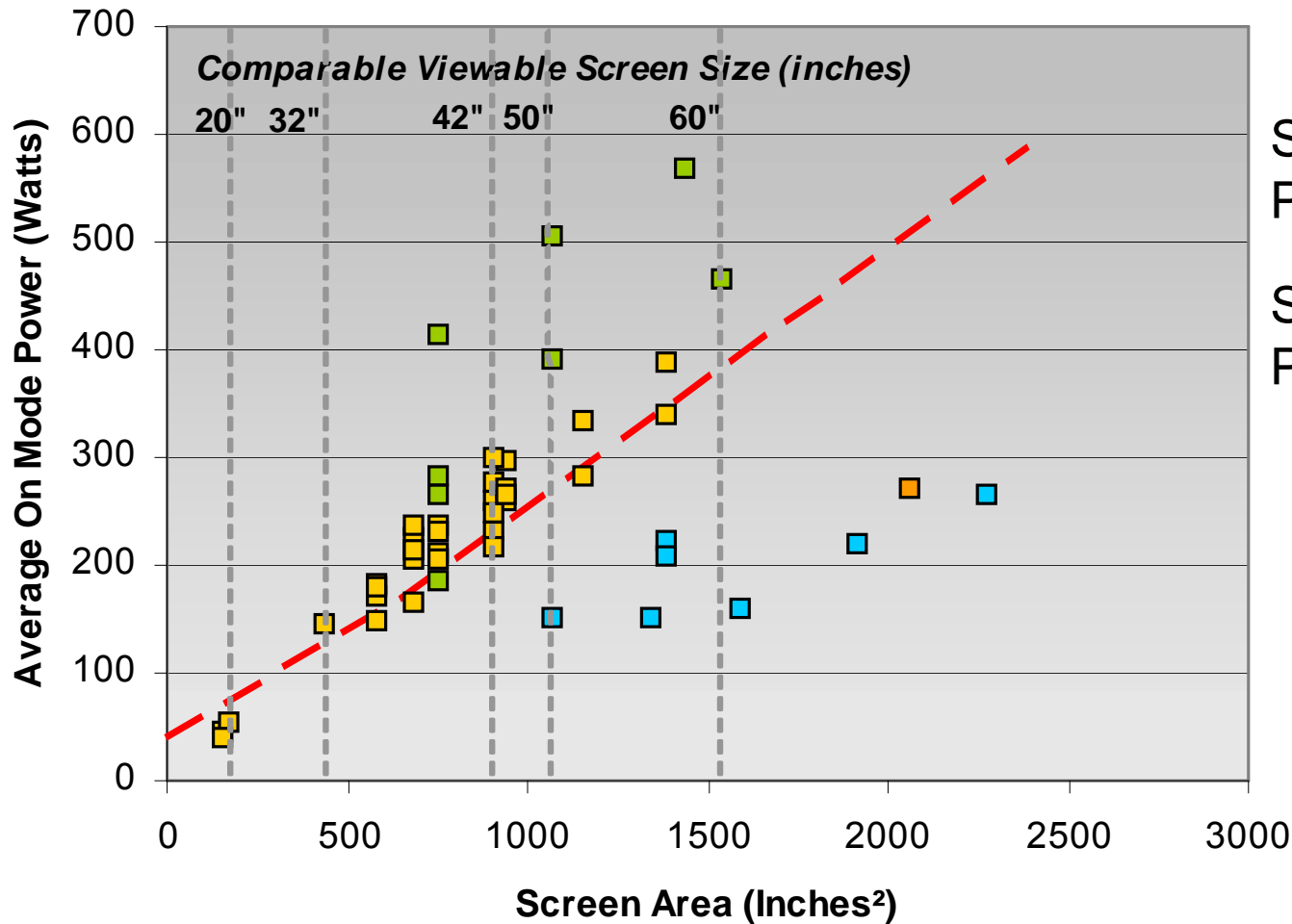
$$P_{Max} = 0.20 * A + 40$$

24/81 (29.6%)
pass for On
Mode

Draft 2 Specification Line: 1080 Resolution



Average On Mode Power for 1080 Lines of Resolution



Screen \leq 650 inch²
 $P_{Max} = 0.20 * A + 40$

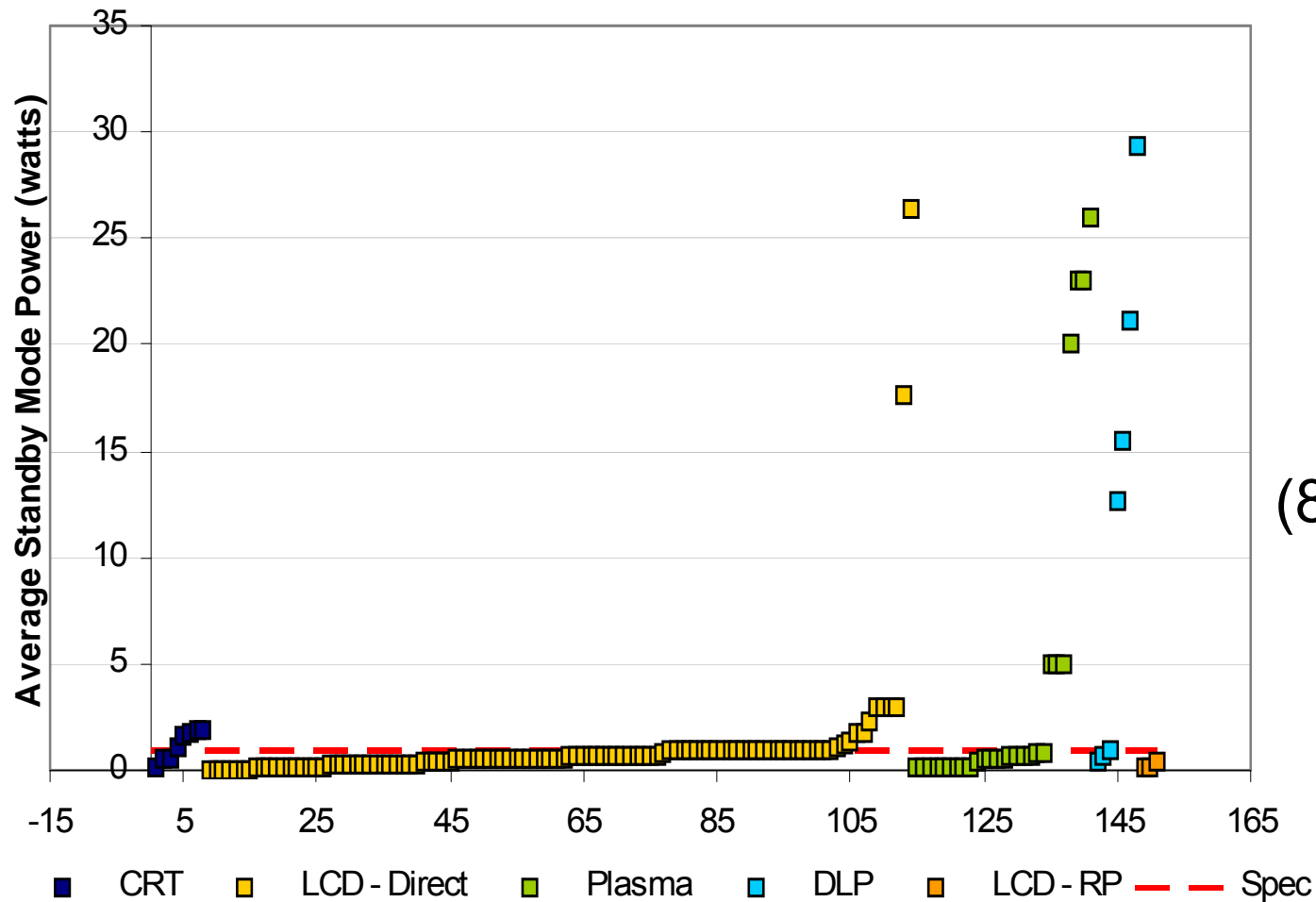
Screen $>$ 650 inch²
 $P_{Max} = 0.24 * A + 14$

19/56 (33.9%)
pass for On
Mode

Draft 2 Standby



Standby Power at Factory Default Settings by Product Type



Standby
Level =
1W

123/151
(81.5%) pass
standby

Overview of TV Data



TV Technology	Total No. of TVs	No. Meet Standby	% Meet Standby	No. Meet On Mode	% Meet On Mode	No. Pass Both	% Pass Both
CRT	8	3	37.5 %	3	37.5%	1	12.5%
LCD	106	94	88.7%	34	32.1%	30	28.3%
Plasma	27	20	74.1%	1	3.70%	1	3.70%
RP-DLP	7	3	42.9%	7	100%	3	42.9%
RP-LCD	3	3	100%	3	100%	3	100%
Total	151	124	81.5%	48	31.8%	38	25.2%

Pass Rate Summary for Proposed Draft 2 Levels



Standby - 123/151 (81.5%) pass Standby

On Mode – 48/151 (31.8%) pass On Mode

Overall – 38/151 (25.3%) pass both On Mode and Standby

Duplicate models removed from dataset to ensure each model only counted once

19 of 30[†] manufacturers (63.3%) represented in the dataset have qualified products

† Because EPA received some masked data, manufacturers *may* be represented more than once in the dataset



Description of Additional Key changes in Draft 2 and Projected Savings

Download Acquisition Mode (DAM)



- Originally introduced in Draft 1 Version 3.0 based on stakeholder requests to allow TVs with EPGs to qualify
- Time-period changed to 3 hours in a 24-hour period
- Power consumption requirement raised to ≤ 12 watts
- Functionality explicitly includes monitoring for emergency communications
- Awaiting CEA proposal on testing and suggested power consumption requirements while in DAM

Test Procedure Updates



- Several changes made to implementation of Draft IEC 62087, Ed.2.0, per stakeholder request:
 - Internet content video signal no longer referenced
 - Section 11.3.6, *Picture Level Adjustments*, explicitly referenced if users forced to select a mode upon initially turning TV on
 - EPA supports stakeholder recommendation of forced menu option, with ‘home’ versus ‘retail’ picture settings
 - Guidance provided on luminance levels for testing TVs with Automatic Brightness Control, to determine P_{Max} and P_{MIN} in:
$$P_A = 0.75 * P_{MAX} + 0.25 * P_{MIN}$$
 - Clarification provided that testing should be conducted without a POD module installed, if present in the product

Tier 2



- EPA has introduced TBD Tier 2 requirements in On mode and DAM
- Tier 2 requirements will recognize those models that make advances in efficiencies over the next 3 years
 - Proposed effective date of September 1, 2010, so two years after proposed Tier 1 effective date
- EPA will initiate development of Tier 2, with stakeholder involvement, approximately six months after Tier 1 takes effect

Projected Savings from Draft 2



Incremental Savings over 5 years (2008 – 2012)

- Energy saved: 7,051 million kWh – roughly equivalent to the energy needed to power Utah for a year
- Dollars saved (2006 \$): \$657 million
- Carbon saved: 1.3 million metric tons



Thank You