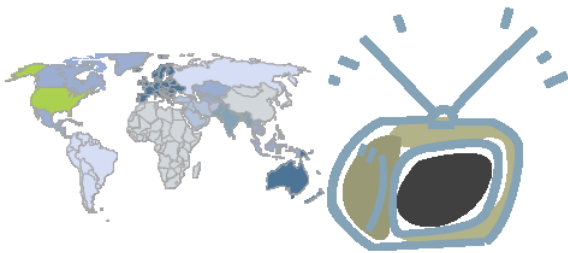
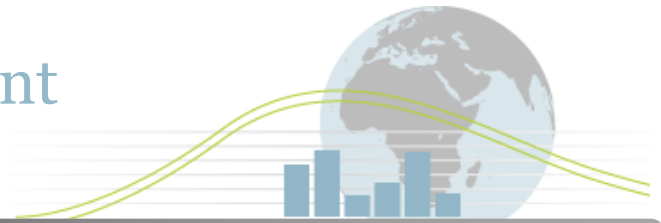


# 4E

## Mapping Document



Country:	USA
Technology:	Televisions
Sub Category:	All Televisions

### Introduction

The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

The summary definition for this product is:

Television sets, defined as:

*'A commercially available and mains electricity powered product consisting of a display and one or more tuner(s)/receiver(s) combined in a single housing. It is designed to receive, decode and display audiovisual signals and reproduce sound from analogue sources and/or digital sources that are decoded directly broadcast via satellite, cable or antenna signals. In the case of digital sources, decoding may be via any external adaptor or receiver.'*

Data will be analysed based upon actual screen size, but may be presented if necessary in three size 'bins':

Screen size category Small (11" to 26")	Screen size category Medium (27" to 39")	Screen size category Large (40" to 60")
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For which segregation and analysis will done through data requested on:

- Screen size
- Aspect ratio (used to calculate screen area and so consumption per unit screen area)

And for which additional later analysis may be planned using data requested on:

- Screen technology
- Analogue or integrated digital
- HD or not

Exclude:

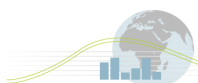
- Combination products (i.e. with integrated DVD player, VCR player / recorder, hard drive).
- Screen sizes over 60" and under 11"
- Television monitors and computer displays

The detailed product definitions can be found at the Annex website:

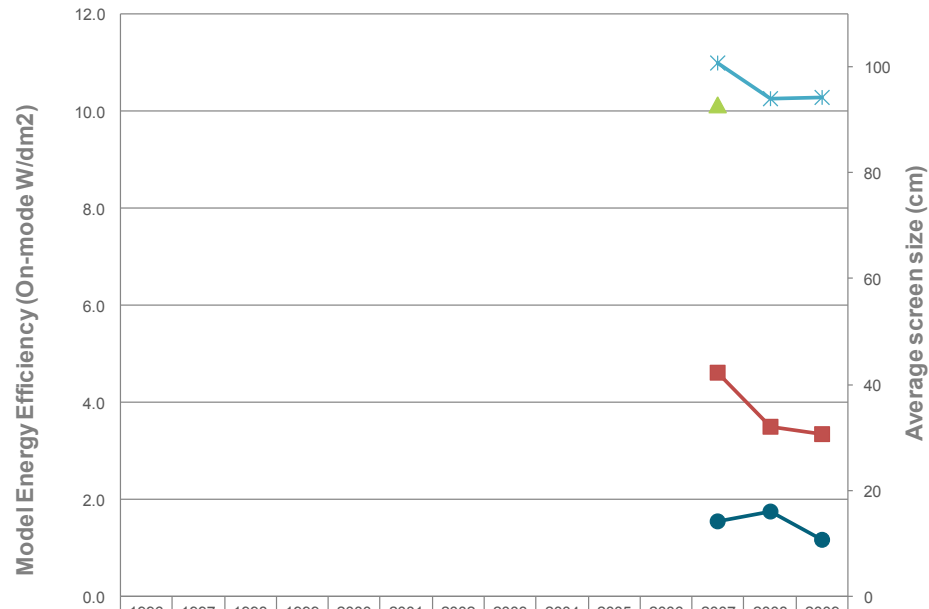
<http://mappingandbenchmarking.iea-4e.org/>

Issue date: October 10

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## Energy Efficiency of New Televisions USA

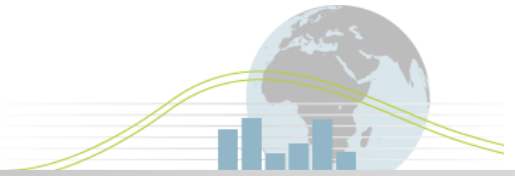


Worst product												10.14		
Product Weighted Average												4.60	3.5	3.3
Sales Weighted Average														
Best Product												1.56	1.8	1.2
Product weighted average screen size (cm)												100.7	94.0	94.3

### Key notes on Graph (see notes section 1)

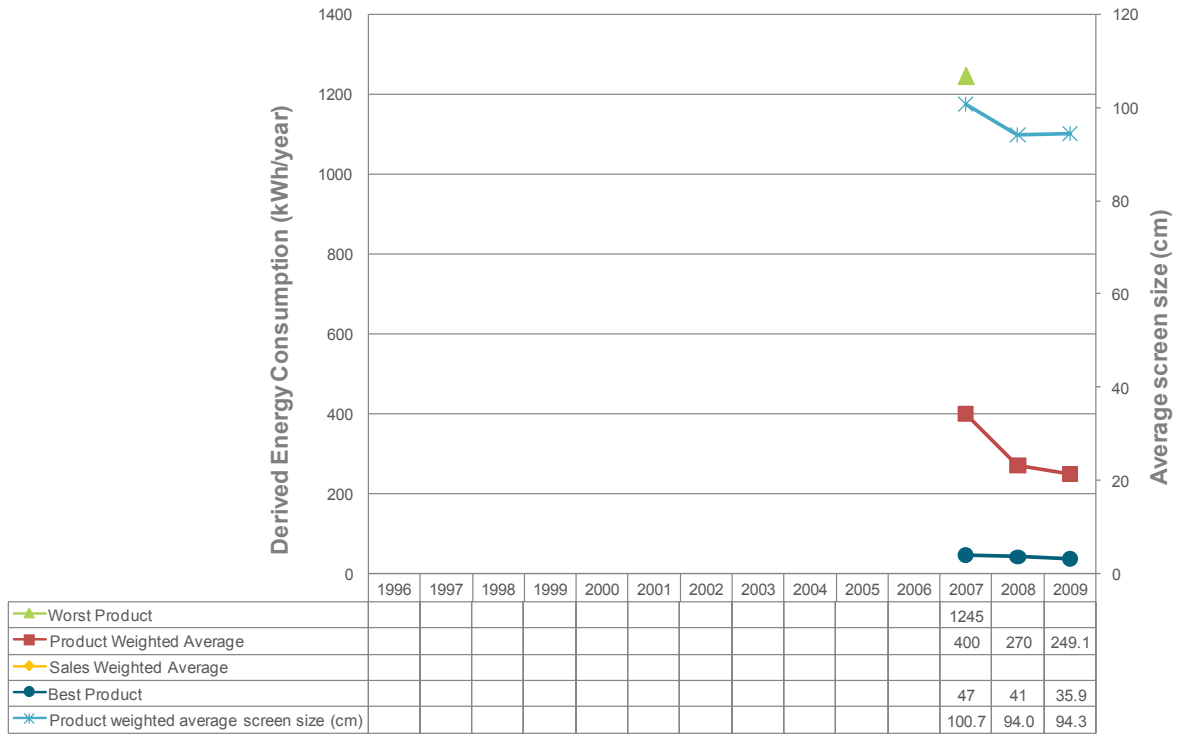
- Graph is based upon on mode consumption only per unit screen area ( $W/dm^2$ ) – not standby.
- Data for 2007 are believed to be representative of the whole US market (from market surveys used to derive the new ENERGY STAR criteria).
- Data for 2008 and 2009 are from the ENERGY STAR<sup>1</sup> database of accredited products and therefore only cover the better performing products, hence the 'worst product' from this data set is probably not representative of the market and is not plotted above.
- In 2009, the most efficient product (per unit screen area) is a 40.2 inch rear projection TV with  $1.18 W/m^2$ . (The least efficient product per screen area in this dataset is an 11" OLED TV with  $7.79 W/m^2$ ).
- In the 2009 dataset, the screen technology distribution (product weighted, not sales weighted) was: Standard: 0.3%; LCD: 86.8%; Plasma: 11.9%; Other (incl. OLED): 1%.
- Note that the 2007 data has a different basis to that of 2008 and 2009. Hence the apparent trend in screen size is unreliable.
- Sales weighted average calculations were not possible (no sales data were available).

<sup>1</sup> For information on the Energy Star Programme for TVs – see:  
[http://www.energystar.gov/index.cfm?fuseaction=products\\_for\\_partners.showTVs](http://www.energystar.gov/index.cfm?fuseaction=products_for_partners.showTVs)



- *Note: Analysis of product efficiency in the benchmarking part of this analysis (comparison between different countries) was based upon an Energy Efficiency Index (EEI), in preference to  $W/dm^2$ . This was to enable fair comparison of efficiencies, since  $W/dm^2$  data is highly dependent upon average screen size which varies between countries.*

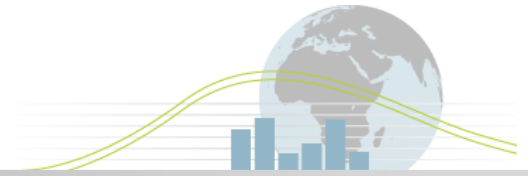
## Energy Consumption of New Televisions USA



### Key notes on Graph (See notes section 2)

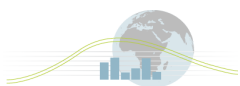
- Annual consumption is calculated assuming five hours per day<sup>2</sup> in on mode, the remainder in standby, for 365 days per year.
- For 2009, the lowest consuming product is a 15.6 inch LCD television (36 kWh per year). This is likely to be one of the lowest consuming on the US market.
- For 2009, the highest consuming product in this dataset is a 60 inch plasma screen television (699 kWh per year). This is probably not the highest consuming product on the US market as ENERGY STAR includes only the more efficient products (hence it is not plotted as 'worst product' above). The highest consuming product in 2007 was a 63 inch plasma television that used 1,245 kWh per year.
- Note that the 2007 data has a different basis to that of 2007 and 2008. Hence the apparent trend in screen size is unreliable.

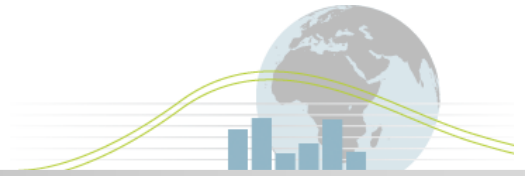
<sup>2</sup> Assumed US average for all televisions in the household, from TIAX LLC report to CEA in 2006.



## Energy Efficiency in the Installed Television Stock USA

No data available.





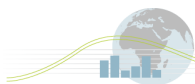
## Energy Consumption in the Installed Television Stock USA



### Key notes on Graph (see Notes Section 4)

- The number of products is calculated by multiplying an estimated number of televisions per household by the number of households in the USA<sup>3</sup>.
- Stock consumption could not be calculated as no data are available on average stock efficiency.
- It is estimated that the average number of television sets per household in 2009 is 2.86.

<sup>3</sup> Assumes that the number of households in USA remains constant from 2007 to 2009 (being the only relevant year available from the US Census Bureau).



## Major Policy Interventions (See notes Section 5)

The ENERGY STAR television specification was introduced in January 1998, covering standby consumption only. By 2007 the market penetration of ENERGY STAR qualified televisions had reached 60% and EPA revised the specification - On Mode power consumption limits came into effect in Version 3.0 in October 2008. At 2009, a large majority of televisions on the market met the revised ENERGY STAR specification and Versions 4.0 and 5.0 ENERGY STAR television specifications are intended to come into effect in May 2010 and May 2012 respectively<sup>4</sup>.

The California Energy Commission (CEC) is developing a mandatory limit on the maximum power consumption in Active and Standby Modes of any television sold in the state of California, though this is meeting resistance due to possible economic impacts. The requirements are proposed to take effect January 2011, with a second tier in 2013.

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<sup>4</sup> Memo to Launch Tier 2 Specification Revision:  
[http://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/tv\\_vcr/Memo%20to%20Launch%20Tier%202%20Specification%20Revision.pdf](http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/tv_vcr/Memo%20to%20Launch%20Tier%202%20Specification%20Revision.pdf).

## Cultural Issues (See Notes Section 6)

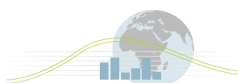
In the US, awareness of and interest in environmental performance of televisions is growing:

- According to a 2008 CEA (Consumer Electronics Association) study, 89% of US households want their next TV to be more energy efficient, and 53% of consumers said they would be willing to pay a premium for a “green” TV<sup>5</sup>
- In a 2009 report released by iSuppli, 27.5% of US LCD TV buyers listed “green” factors as important influences on their purchasing decisions. “Green” factors were more important to consumers buying higher end and/or larger TVs.<sup>6</sup> The report noted that even amid the current economic downturn, a growing number of consumers are selecting products for their environmentally friendly features.
- According to a GfK Roper Survey in March of 2009, 82% of consumers say “green” features play a role in their decision to purchase a new consumer electronics product, such as a TV.<sup>7</sup>

<sup>5</sup> “Going Green: An Examination of the Green Trend and What it Means to Consumers and the CE Industry.” Consumer Electronics Association (CEA), 2008.

<sup>6</sup> iSuppli via TWICE: [http://www.twice.com/article/251493-iSuppli\\_Green\\_Awareness\\_High\\_Among\\_LCD\\_TV\\_Purchasers.php](http://www.twice.com/article/251493-iSuppli_Green_Awareness_High_Among_LCD_TV_Purchasers.php).

<sup>7</sup> Earthtoys, April 16, 2009: <http://www.earthtoys.com/news.php?section=view&id=9096>.





## Notes on data

### Section 1: Notes on Product Efficiency

#### 1.1 Test methodologies, Performance Standards and Labelling Requirements

The ENERGY STAR TV Specification Version 3.0 requires testing to a methodology based on IEC 62087, Ed 2.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment. This is the test methodology adopted as the baseline for this analysis and so no adjustment has been necessary for the US state. ENERGY STAR requires standby to be measured to Draft IEC 62301 Ed. 2.0: Household Electrical Appliances – Measurement of Standby Power - once again, this is the same as the baseline adopted for this analysis.

Versions 4.0 and 5.0 ENERGY STAR TV specifications are likely to refer to a CEA standard for clarification in testing On Mode: Draft CEA-2037: Determination of Television Average Power Consumption.

The on mode consumption requirement was introduced to ENERGY STAR in 2008, and so on mode data is not available prior to that point.

#### 1.2 Product Efficiency Graphic

##### Key calculations undertaken:

**Calculating screen areas:** Firstly, convert diagonal screen size inches to dm (x0.254), square the number, then multiply by the factor below. If no aspect ratio, an assumed ratio is used (based on statistical profile of TVs at 2008)

Aspect Ratio	Factor
16:9	0.427299703
16:10	0.449438202
4:3	0.48
Unknown	0.427299703

**Usage assumptions:** Hours spent in each mode are assumed for all sets (given below). Each value of consumption (W) is multiplied by hours per day x 365 to get Wh per year, divided by 1000 to get kWh per year.

Hours per day in on mode	5
Hours per day in standby mode	19

**Efficiency** (kWh/dm<sup>2</sup>) is W in on mode, divided by screen area in square dm

**Sales Weighted Energy Efficiency of New Models:** (Sum of (Model Energy Efficiency multiplied by sales volume of Model in year) for all Models) divided by (Sum of sales volume of all Models in year)

**Model Weighted Energy Efficiency of New Models** (used where no sales data is available): (Sum of Model Energy Efficiency for all models sold in year) divided by (Number of Models sold in year)

**Proportion of data set included:**

Some of the data in the database was not used due to the omission of information necessary to undertake the analysis.

In addition, the data set contains products from 1998-2009 (dated via their date of accreditation or manufacture). However, since televisions are extremely unlikely to remain on the market for more than two or three years, products dating from more than three years before the year being analysed have been deleted from that analysis set to avoid them skewing the results.

Additional data were supplied by the US team, sourced from the Californian Energy Commission. Closer inspection of this revealed that much of the US data was already included in the 2007 ENERGY STAR development data set; other data were from outside of the US or using incompatible test methodologies.

The proportion of the total data sets used were as follows:

	2007	2008	2009
Products analysed	148	368	914
Products removed	27	3291	3424
% of products submitted that were analysed	85%	10%	21%

**Section 2: Notes on Product Consumption**

*2.1 Test methodologies, Performance Standards and Labelling Requirements*

None.

*2.2 Product Consumption Graphic*

None.

**Section 3: Notes on Efficiency of Stock**

No data on a stock efficiency were available.

**Section 4: Notes on Consumption of Stock**

Average number of television sets per household (from Nielson data supplied by US team):

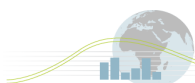
2005 2.62

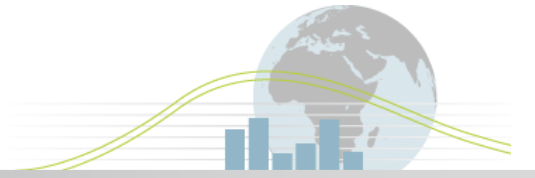
2006 2.73

2007 2.79

2008 2.83

2009 2.86





Number of 'housing units' in the US in 2007 was 127.9 million<sup>8</sup>. Hence indicative US stock of televisions is (millions):

2007 356.841

2008 361.957

2009 365.794

### **Section 5: Notes on Policy Interventions**

*None.*

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<sup>8</sup> US Census Bureau - <http://quickfacts.census.gov/qfd/states/00000.html>

