

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35

**Preliminary Television Market and Industry Research**

Prepared for:

US EPA  
in support of the  
ENERGY STAR® TV Specification Revision

January 6, 2006

**Preliminary Television Market and Industry Research  
Table of Contents**

|    |   |    |
|----|---|----|
| 36 |   |    |
| 37 |   |    |
| 38 |   |    |
| 39 | Background on Current ENERGY STAR TV Specification.....         | 3  |
| 40 |   |    |
| 41 | North American TV Market and Its Relevance for ENERGY STAR..... | 3  |
| 42 |   |    |
| 43 | Key Technologies for the North American Market.....             | 6  |
| 44 |   |    |
| 45 | CRT Televisions.....  | 7  |
| 46 |   |    |
| 47 | LCD Televisions.....  | 8  |
| 48 |   |    |
| 49 | Plasma Televisions.....   | 9  |
| 50 |   |    |
| 51 | DLP Televisions.....  | 10 |
| 52 |   |    |
| 53 | Next Steps.....   | 10 |
| 54 |   |    |
| 55 | Sources.....  | 12 |
| 56 |   |    |

## Preliminary Television Market & Industry Research

This report provides an overview of the US television market, prepared on behalf of the US Environmental Protection Agency (EPA), as it begins a major revision of the current ENERGY STAR® specification for televisions and VCRs (henceforth known as the ENERGY STAR TV specification).

### Background on Current ENERGY STAR TV Specification

The ENERGY STAR TV specification was originally launched at The Consumer Electronics Show® (CES) in January 1998. Since then, it has undergone a significant revision to decrease the standby mode power levels to one watt or less for products covered by the specification. This change was achieved through implementing a tiered approach to the revised specification, which was launched on July 1, 2002. The final tier of this revised specification took effect on July 1, 2005. Two minor amendments also were made, on September 15, 2003 and June 21, 2005 (Tier 3). The first of these amendments regarded expanding the specification to allow Digital Cable Ready (DCR) televisions with Point of Deployment (POD) slots to qualify and the second clarified which products were eligible for the one-watt Illuminated Display Allowance under Tier 3 of the specification.

The purpose of the current specification is to recognize TVs with low energy consumption when turned off or in the standby mode. This approach was an important first step in reducing TV energy use due to the vast amount of time they spend in standby mode and the millions of televisions in use in US homes. In 1998 when the specification was introduced, EPA estimated that ENERGY STAR qualified televisions would use about 20 percent less energy in a year than comparable televisions. See Table 1 below. (Please note that this analysis was based on CRT technology; other technologies, such as LCD and plasma, were not prevalent in the consumer market when the ENERGY STAR TV specification was released.)

**Table 1: Initial ENERGY STAR TV Savings Analysis**

|                                  | <b>Baseline TV</b> | <b>ENERGY STAR TV</b> | <b>Savings</b> | <b>% Savings</b> |
|----------------------------------|--------------------|-----------------------|----------------|------------------|
| Standby Energy (kWh)             | 40.4               | 12.3                  | 28.1           | 69.5%            |
| Active Energy (kWh)              | 143.7              | 135.9                 | 7.9            | 5.5%             |
| <b>Total Annual Energy (kWh)</b> | <b>184.2</b>       | <b>148.2</b>          | <b>36.0</b>    | <b>19.5%</b>     |

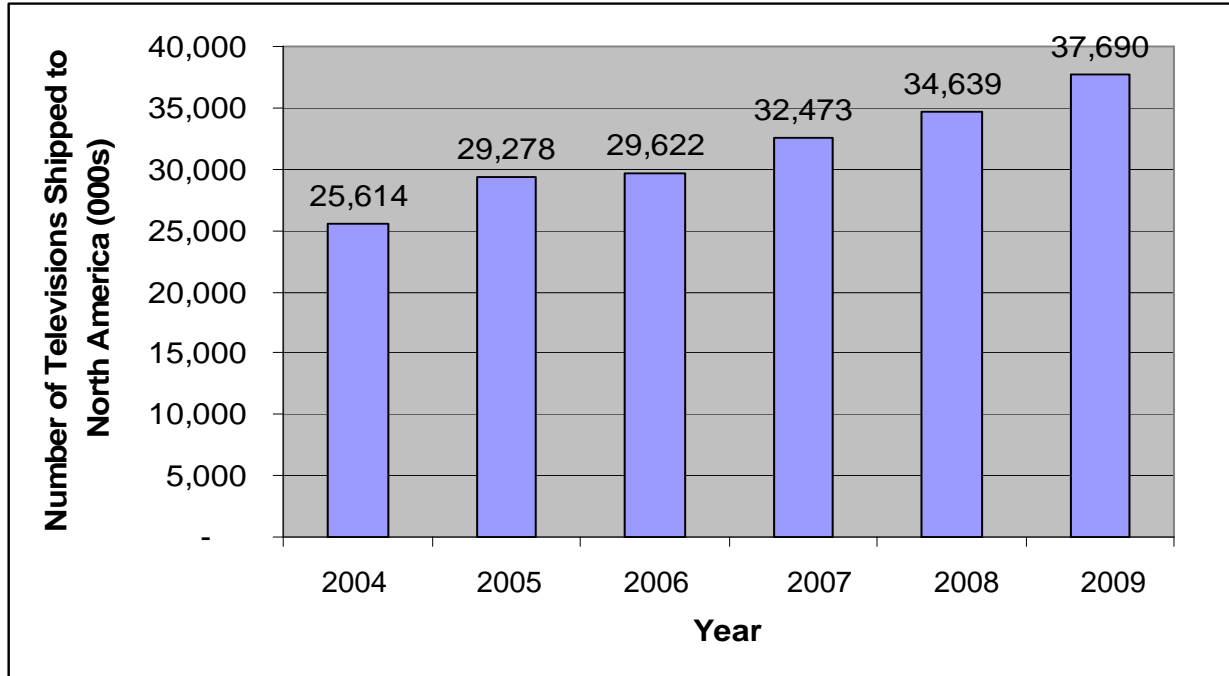
Source: Developed by Lawrence Berkeley National Laboratory (LBNL) for EPA ENERGY STAR in 1998.

With the prevalence of new display technologies, which can consume significantly more energy in active mode than CRT models, and shifts in consumer viewing habits, EPA believes that standby power is no longer an effective measure of overall television efficiency. For example, it is currently possible for a television to earn the ENERGY STAR by meeting low standby levels while drawing significant power in on mode. Significant opportunity now exists for EPA to address all relevant operational modes and technologies so consumers can easily identify the most energy-efficient models in the marketplace.

### North American TV Market and Its Relevance for ENERGY STAR

Not surprisingly, the number of televisions in the United States is growing. According to iSuppli's Television Systems Market Tracker for the fourth quarter of 2005, the estimated market value of all televisions shipped to North America in 2004 was \$19.19 billion. This value is expected to grow by 19.6% in 2005 to \$23.89 billion. In terms of units, 2004 saw approximately 25.6 million televisions shipped to North America. Shipments are expected to increase by 14% (29.3 million) in 2005 and reach a total of 37.69 million televisions by 2009 (see Figure 1).

**Figure 1: Estimated Number of TVs (in 000s) Shipped to North America per Year from 2004 – 2009**



104

Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.

105

106

107

TV shipment growth can be attributed to several major factors, including:

108

- Consumers showing higher preference for larger screen sizes, with a greater availability of televisions in 40-inch-plus sizes and declining price points;
- Value brands entering the market, which are slowly gaining consumer acceptance;
- Consumers investing in new units in preparation for the move from analog to digital over-the-air (OTA) signal transmission;
- The increased adoption of flat panels, allowing consumers to find new places in the household for televisions – kitchens, bathrooms, home-offices, etc.; and
- A decline in the average selling price of televisions.

109

110

111

112

113

114

115

116

117

Associated with the rise in TV shipments is an increase in the number of TVs per household. According to data from the Consumer Electronics Association (CEA), there are currently 285 million televisions in use in US households. And per recent survey results that appeared in USA Today, there is currently an average of 2.8 working televisions in a US household. As consumers buy new televisions, typically every seven to nine years, this number is expected to grow because rather than dispose of their old ones, which often still work due to the relatively long life-cycles of these products, they are placed in alternate locations, such as the kitchen and children's bedrooms.

122

123

124

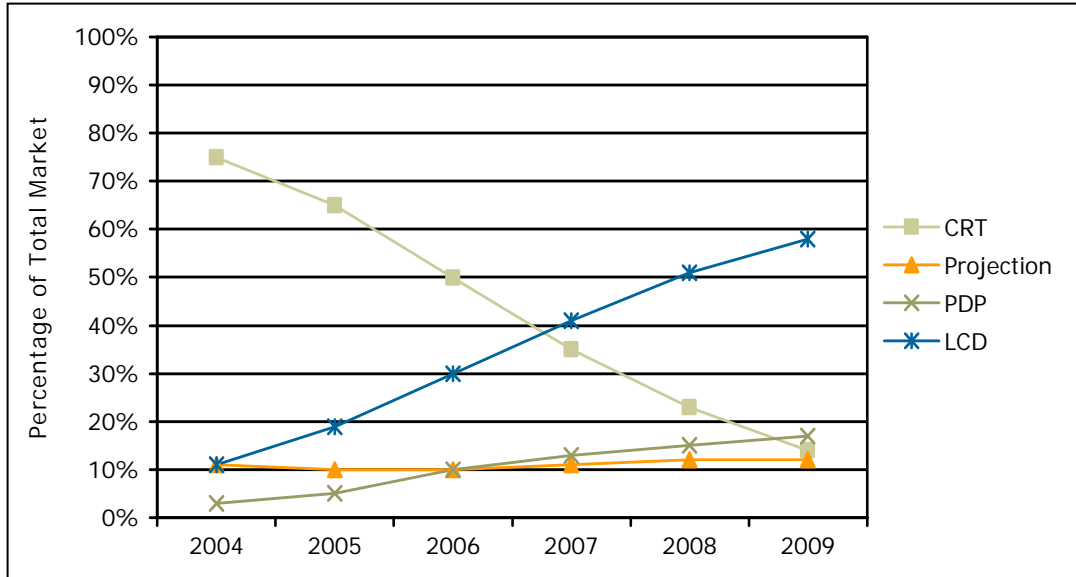
125

In addition, the North American TV market is quickly moving towards greater adoption of large screen, flat panel televisions (see Figure 2). By 2009, it is estimated that 71.5% of the market will be comprised of flat panel televisions measuring 30 inches and above in screen size.

126

127

128

**Figure 2: Estimated North American TV Technology Penetration from 2004 – 2009**

Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.

As depicted in Figure 2, it is expected that shipments of LCD televisions will overtake shipments of CRT televisions at the beginning of 2007. And approximately two years later, shipments of plasma televisions also will overtake those of CRT televisions.

Overall, many of the large screen, flat panel televisions being purchased by consumers will consume double or more the active mode power of the smaller CRT televisions that they are replacing. Some of this differential in power consumption is because large screen televisions, being bigger than their predecessors, will naturally consume more power to operate. Many of these newer televisions also are digital and capable of showing high-definition picture, which also drives up overall power consumption.

Further, there can be a wide disparity in power consumption amongst similar televisions that incorporate the same screen technology. For example, according to a recent Digitimes article on the seven most energy-efficient 37-inch flat panel televisions currently available in the Japanese market, there is a 55 kWh per year difference in the measured annual power consumption of the most efficient flat panel available on the market and the sixth most efficient flat panel available, both of which are LCD televisions. However, a plasma television was found to be the third most efficient flat panel model available, with an annual power consumption that measured 71 kWh per year less than the next best performing plasma model on the marketplace in terms of energy efficiency. (Out of the seven models mentioned in the article, five were LCDs and two were plasmas.) Due to this variation in power consumption, EPA wants its new specification to recognize those manufacturers that are investing in research and development to introduce more energy-efficient TV models across all modes of operation.

The variety and number of features available on new televisions is expanding and, in many cases, will impact overall energy consumption. For example, consumers must now consider the following when purchasing a new television: picture quality, price, size (overall and in terms of thickness), regular or high definition capable, wide-screen or normal aspect ratio, TV sound, audio/video (A/V) input and outputs, and other features (e.g., digital cable ready, parental controls, etc.).

As televisions physically change in terms of their size, shape, and functionality, so do their usage patterns. Americans are spending more hours a day watching television, both due to the increased availability of cable and satellite programming content and the rapid adoption of DVDs. And with the growth in sales of game consoles, there is an additional increase in the number of hours a typical television operates each day. According to Nielsen Media Research, for the September 2004 – September 2005 viewing season, the average US household was tuned into television an average of 8 hours and 11 minutes per day. Even though televisions continue to spend the majority of time in standby mode, the energy consumed by them for the few

169 hours a day that they are active accounts for 80 – 95% of their annual energy consumption. In fact, some of  
 170 the larger TVs on the market today use as much energy as a new refrigerator (e.g., 500 kWh/year). (See  
 171 Table 2 for the estimated annual power consumption of US televisions in active mode and all modes.)  
 172  
 173

**Table 2: Annual Power Consumption Estimates for US TVs (kWh/Year)**

| Television Display Type | All Modes - Average Power Consumption per Unit | Active Mode Only - Average Power Consumption per Unit |
|-------------------------|--|---|
| CRT                     | 244  | 216   |
| LCD                     | 256  | 192   |
| Plasma                  | 679  | 532   |
| DLP                     | 444  | 311   |

174 Source: Prepared by LBNL. Data derived from various sources.  
 175

176 Further, EPA estimates that currently, all US televisions consume 69 TWh/year, costing consumers \$5 billion  
 177 annually to power their sets. In 2010, it is projected that this number will rise by approximately 75% and US  
 178 televisions will consume 121 TWh/year, costing consumers over \$8 billion annually to power their sets. (See  
 179 Table 3 for the estimated annual national power consumption of US televisions, projected through 2010.)  
 180  
 181

**Table 3: Annual National Power Consumption Estimates for US TVs (TWh/year)**

| Television Display Type | Year      |           |           |           |            |            |
|-------------------------|-----------|-----------|-----------|-----------|------------|------------|
|                         | 2005      | 2006      | 2007      | 2008      | 2009       | 2010       |
| CRT                     | 57        | 55        | 53        | 50        | 46         | 42         |
| DLP                     | 1         | 2         | 3         | 3         | 4          | 5          |
| LCD                     | 5         | 6         | 7         | 9         | 11         | 13         |
| Plasma                  | 6         | 12        | 20        | 31        | 45         | 61         |
| Other                   | 0.00      | 0.05      | 0.10      | 0.16      | 0.24       | 0.32       |
| <b>Total</b>            | <b>69</b> | <b>75</b> | <b>84</b> | <b>94</b> | <b>106</b> | <b>121</b> |

182 Source: Prepared by LBNL. Data derived from various sources.  
 183

184 As substantiated by the data and trends presented above, the United States is experiencing several significant  
 185 changes to the TV market: 1) shipments and the number of TVs per household are growing; 2) new consumer  
 186 viewing habits are increasing the amount of time a TV spends in active mode; 3) differences in manufacturer  
 187 design are leading to variations in power consumption amongst similar technologies and models; and 4) many  
 188 consumers are choosing larger, feature-rich models that on average consume more energy than their  
 189 predecessors. In fact, residential electricity use by consumer electronics products alone has doubled since the  
 190 late 1990s; this category is now responsible for up to 15% of household electricity use and may reach 30% by  
 191 2015. These increases in TV sales, usage patterns, and power consumption, suggest that it is time to reopen  
 192 the specification and develop new ENERGY STAR TV criteria that reflect today's marketplace.  
 193

### Key Technologies for the North American Market

194 Several new display technologies have entered the marketplace since the launch of the first ENERGY STAR  
 195 TV specification in 1998. Table 4 provides a brief overview of the four primary television technologies  
 196 currently available in North America. Immediately following the table is a market summary of each technology.  
 197  
 198  
 199  
 200  
 201  
 202  
 203  
 204  
 205  
 206  
 207  
 208

**Table 4: Overview of Four Primary TV Technologies Available in North America**

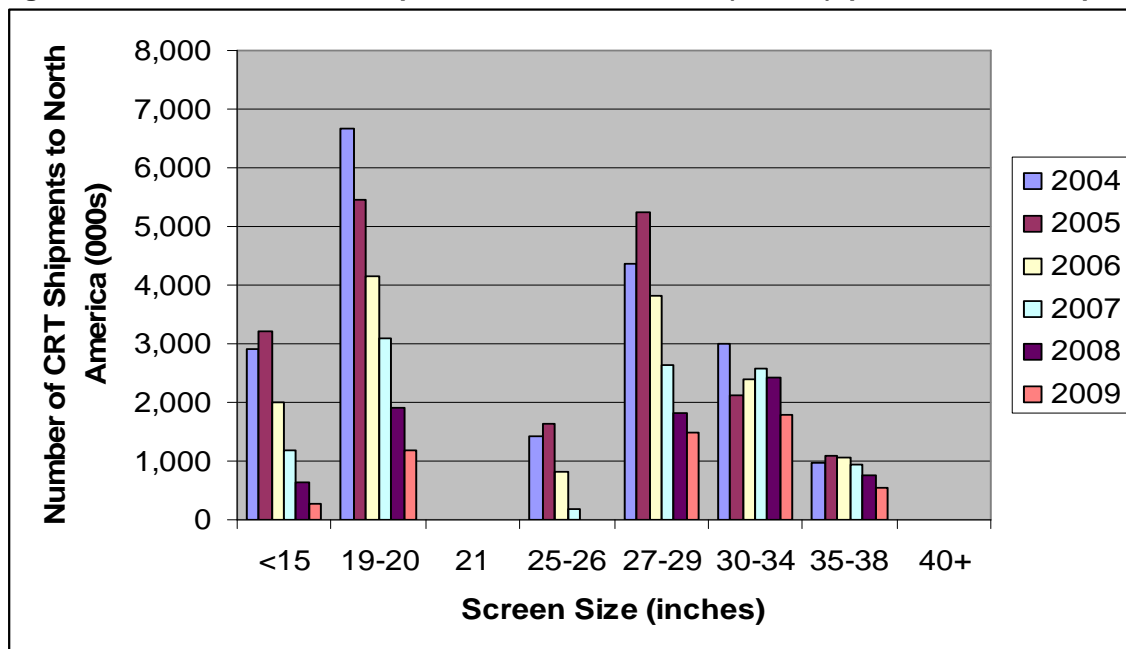
| Characteristics   | CRT             | LCD                            | Plasma                         | DLP                     |
|---|-----------------|--------------------------------|--------------------------------|-------------------------|
| Range of Screen Sizes Available (Inches)                      | <15 - ≥40       | 10 - ≥50                       | 31 - ≥60                       | <50 - >60               |
| Average Selling Price in 2005 & 2009                          | \$302; \$184    | \$1,352; \$674                 | \$2,774; \$877                 | \$2,483; \$966          |
| Est. Product Lifetimes  | 5-10 years      | 50,000-60,000 hours of viewing | 30,000-60,000 hours of viewing | 75,000 hours of viewing |
| Top Manufacturer in 3 <sup>rd</sup> Qtr 2005 (% of Shipments) | TTE Corporation | Sharp Electronics Corporation  | Panasonic (Matsushita)         | Samsung Corporation     |

Source: Prepared by ICF Consulting. Data derived from various sources.

### CRT Televisions

The most mature technology currently available for televisions, CRTs, continued to account for the vast majority of televisions shipped to North America in 2004. This technology comprised approximately 75% of total shipments, or 19.32 million units. Of these 19.32 million units, over half were larger than 24 inches in screen size. In 2005, it is estimated that approximately 64% of the total number of televisions shipped to North America will be CRTs, or 18.76 million units. This overall decrease in both the number of CRTs shipped to North America and the percentage of total shipments comprised of CRTs is estimated to escalate and in 2009, only 5.27 million CRTs (13.8% of total shipments) are expected to ship to North America (see Figure 3).

**Figure 3: Estimated CRT TV Shipments to North America (in 000s), per Screen Size & per Year**



Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.

The decline in CRT shipments can be attributed to a number of factors, including:

- Relatively low margins on this technology, causing manufacturers to shift resources to other areas;
- Increased adoption of flat panels due to their declining prices, leading to a smaller price-differential between similar sized LCD and CRT televisions; and
- The attractive form factor of flat panels and in many cases, the ability to receive digital OTA programming, which complements consumer lifestyles and preferences.

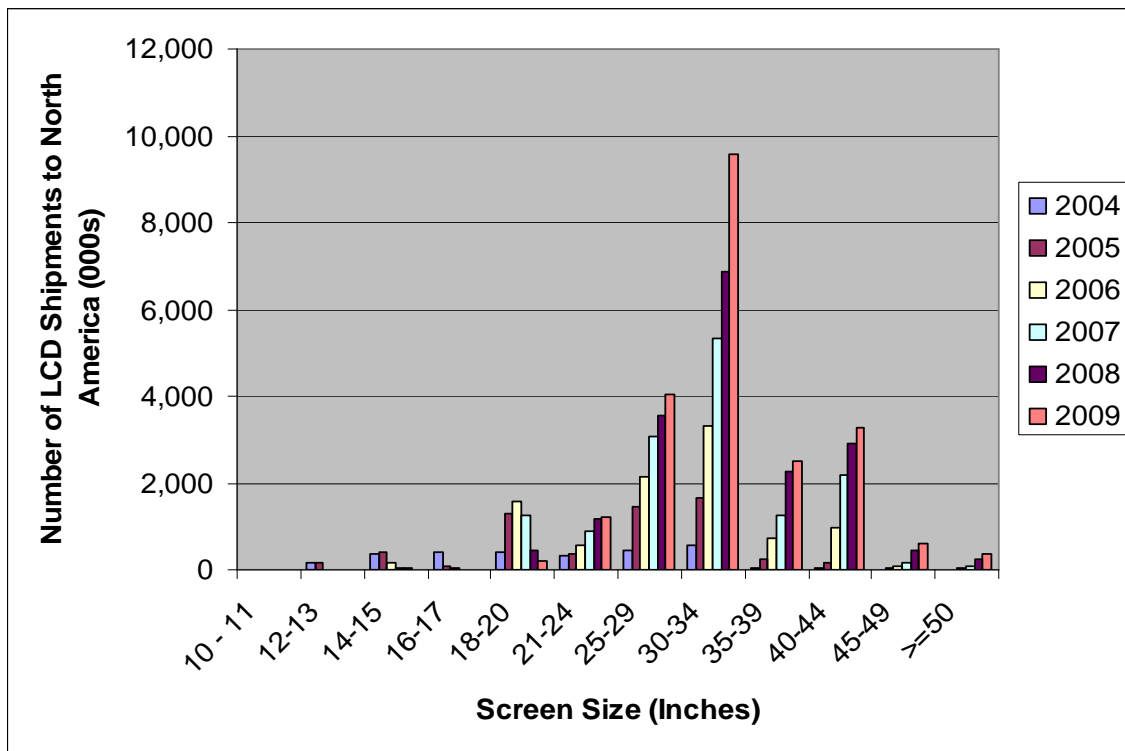
232 In 2004, the average selling price of a CRT television was \$319. In 2009, the average CRT selling price is  
 233 expected to drop to \$184. This fairly aggressive decline in the average selling price for CRTs will likely  
 234 continue as CRT manufacturers attempt to stay more price-competitive against flat panels in this market.  
 235

236 In terms of CRT market share in North America, TTE Technology, Inc. held the largest share during the third  
 237 quarter of 2005 with 14.18%. Toshiba (8.66%), Sanyo (8.11%), Panasonic/Matsushita (6.75%), and Sony  
 238 (5.57%) rounded out the top five. All are ENERGY STAR partners for televisions.  
 239

240 **LCD Televisions**

241 LCD televisions are the most rapidly growing TV technology market in North America. In 2004, approximately  
 242 10.75% of the total television shipments to North America were LCDs, or 2.75 million units. Of these 2.75  
 243 million units, over half were larger than 21 inches in screen size. In 2005, it is estimated that approximately  
 244 20.25% of the total number of televisions shipped to North America will be LCDs, or 5.93 million units. This  
 245 growth trend is expected to continue with an estimated 21.8 million LCDs shipped to North America in 2009,  
 246 accounting for 57.8% of televisions shipped to this market (see Figure 4).  
 247  
 248

**Figure 4: Estimated LCD TV Shipments to North America (in 000s), per Screen Size & per Year**



249 Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.

250 The increase in LCD unit shipments can be attributed to a number of factors, including:

- 251
- 252
- 253 ■ The attractive form factor of LCDs, which fits well with consumer life-styles;
- 254 ■ A decline in the average sales price of LCDs as an increased number of sixth and seventh generation LCD
- 255 fabs reach full production;
- 256 ■ An increased number of large LCD panels becoming available for the manufacture of televisions, meaning
- 257 that this technology can now compete with other flat-panel technologies in terms of screen size *and*
- 258 decreasing price differentials; and
- 259 ■ Improved product performance.

260  
 261 In 2004, the average selling price of an LCD television was \$1,682. The smallest screen sizes available, from  
 262 10 – 11 inches, sold at an average of \$482 while screen sizes from 45-49 inches sold at an average of \$7,537.  
 263 In 2005, the average selling price of an LCD television is estimated to decrease by approximately 20% to  
 264 \$1,352. As LCD manufacturers attempt to reduce the price differential between CRT televisions and become  
 265 more price-competitive against other flat-panel technologies, similar price declines are expected through 2009,  
 266 reaching an average price of \$674 or 60% less than the 2004 figure.



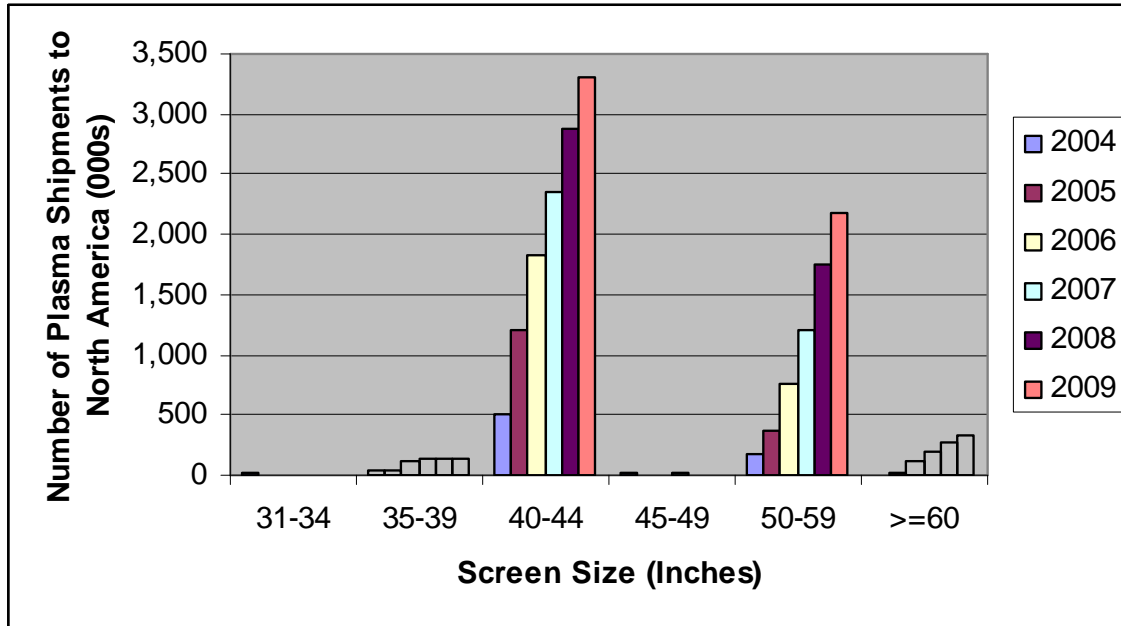
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279

In terms of LCD market share in North America, Sharp Electronics Corporation held the largest share during the third quarter of 2005 with 15.08%. Other market leaders included Philips, Sony, Samsung, and Advent with 10.42%, 9.69%, 7.38%, and 5.30% market shares, respectively.

### Plasma Televisions

In 2004, approximately 2.9% of the total television shipments to North America were plasmas, or 0.75 million units. Of these 0.75 million units, the vast majority were larger than 40 inches in screen size. In 2005, it is estimated that approximately 5.6% of the total number of televisions shipped to North America will be plasmas, or 1.65 million units. By 2009, 5.97 million plasmas are expected to ship to North America; this will represent approximately 15.9% of televisions shipped to this market (see Figure 5).

**Figure 5: Estimated Plasma TV Shipments to North America (in 000s), per Screen Size & per Year**



280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302

Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.

The increase in plasma television shipments can be attributed to a number of factors, including:

- Declining price points as plasma television manufacturers strive to gain an increased share of the large screen flat panel market prior to sixth and seventh generation LCD fabs reaching full production;
- The attractive form factor of plasmas, which fits well with consumer life-styles;
- Increased availability of plasma televisions through a variety of channels, such as consumer electronics outlets, high-end audio and video stores, and mass merchandisers and price clubs; and
- Increased capacity from plasma panel manufacturers, leading to a decline in the average sales price of these products as they become more readily available.

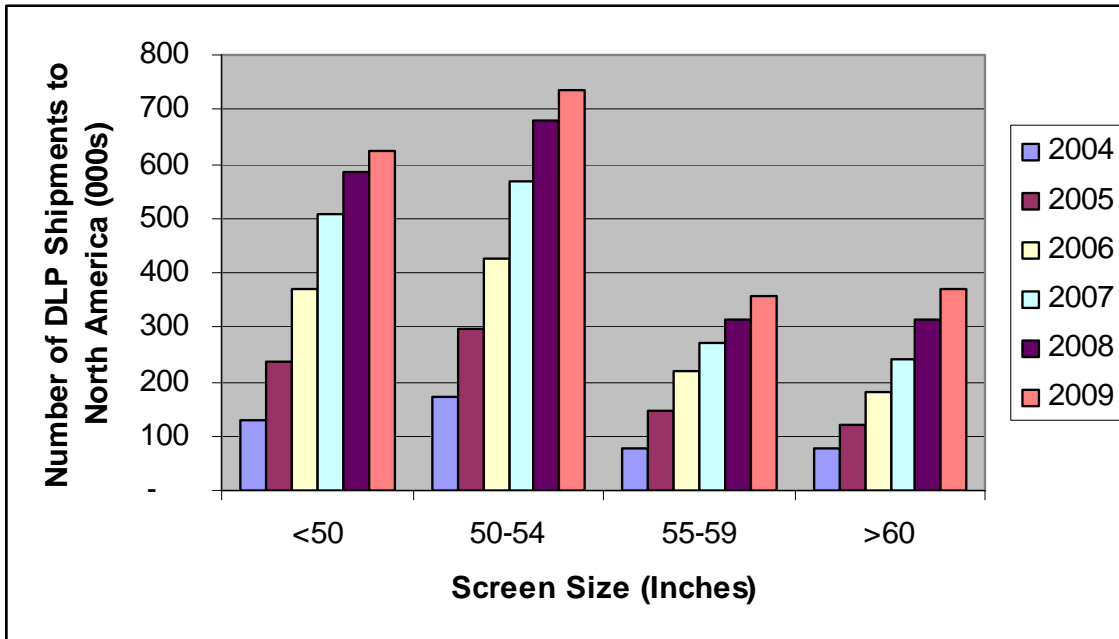
In 2004, the average selling price of a plasma television was \$3,823. The smallest screen sizes available, from 31 – 34 inches, sold at an average of \$3,823 while screen sizes 60 inches and above sold at an average of \$11,451. In 2005, the average selling price of a plasma television is estimated to decrease by approximately 17.5% to \$2,774. As of 2006, it is estimated that there will be no shipments of plasma televisions with screen sizes below 35 inches to North America. By 2009, analysts predict an average plasma selling price of \$877.

In terms of plasma television market share in North America, Panasonic (Matsushita Electric Industrial Co.) held the largest share during the third quarter of 2005 with 50.5%. Samsung Corporation held the second largest market share at 11.21%, followed by LG Electronics at 10.11%.

303 **DLP Televisions**

304 DLP televisions incorporate a relatively new technology available in the market, and currently account for the  
305 lowest number of overall television shipments to North America. In 2004, approximately 1.8% of the total  
306 television shipments to North America were DLPs, or 0.45 million units. In 2005, it is estimated that shipments  
307 of DLPs will almost double, reaching a total of 0.8 million units. However, they will still only comprise 2.7% of  
308 the total number of televisions shipped to North America. DLP shipments are expected to slowly increase; in  
309 2009, an estimated 2.1 million DLPs will ship to North America, accounting for approximately 5.53% of  
310 televisions shipped to this market (see Figure 6).  
311

312 **Figure 6: Estimated DLP TV Shipments to North America (in 000s), per Screen Size & per Year**



313 Source: iSuppli's Television Systems Market Tracker – Q4 of 2005.  
314

315  
316 DLP shipments are not increasing as rapidly as other technologies because they are generally more  
317 expensive and still require some type of TV stand (unlike other flat panel technologies that can be hung on the  
318 wall). Samsung Corporation currently holds the largest market share for shipments of DLPs in North America.  
319

320 In 2004, the average selling price of a DLP television was \$3,102. The smallest screen sizes available, below  
321 50 inches, sold at an average of \$2,515 while screen sizes above 60 inches sold at an average of \$3,696. In  
322 2005, the average selling price of a DLP television is estimated to decrease by approximately 20% to \$2,483.  
323 By 2009, the average selling price is projected to be \$966.  
324

325 **Next Steps**

326  
327 The drafting of this market research report is one of the initial steps in the ENERGY STAR specification  
328 revision process. As outlined in the ENERGY STAR Guiding Principles, EPA strives to develop energy-  
329 efficiency specifications that are performance-based and technology neutral (i.e., specifications that evaluate  
330 all models in a product category, such as televisions, in the same manner, regardless of technology). This  
331 approach offers several benefits, including specification longevity (i.e., specification does not have to be  
332 automatically revised each time a new technology, such as SED or OLED, is introduced) and easy product  
333 comparisons based on the ENERGY STAR mark (e.g., performance-based specifications allow consumers to  
334 easily choose the most energy-efficient model to suit their needs and preferences). For the ENERGY STAR  
335 TV specification, EPA plans to follow this established approach and will accordingly develop one test method  
336 and specification for all display technologies. Key steps, consistent with ENERGY STAR's guiding principles  
337 and established procedures, are briefly outlined below.  
338

- 339 ▪ Establish new and varied industry contacts. EPA is in the process of expanding its list of stakeholders  
340 to include engineers and other technical staff involved in the design of TV technologies.

- 341 ▪ Complete market research. Stakeholders will be asked to provide their input on this market research  
342 report. Where appropriate, EPA will incorporate stakeholder feedback before finalizing the document  
343 and posting it on the ENERGY STAR Web site at  
344 [http://www.energystar.gov/index.cfm?c=revisions.tv\\_vcr\\_spec](http://www.energystar.gov/index.cfm?c=revisions.tv_vcr_spec).
- 345 ▪ Develop a new test procedure to measure the amount of energy consumed by a television in active or  
346 on mode. A number of key governments, including Canada, Australia and the European Union, have  
347 already expressed an interest in working with EPA and the manufacturing community to develop a  
348 single, harmonized global test procedure for televisions as an early step in the specification revision  
349 process. This test procedure will take into account variables such as what programming is displayed  
350 and its format and measure all televisions in the same manner, regardless of technology. Ultimately,  
351 the test procedure will be used by each of these government entities, should they choose to implement  
352 policies to encourage the sale of more efficient televisions. A first draft of the test procedure is  
353 expected to be available in late March 2006, and will be shared with manufacturers and other  
354 stakeholders for their review and comment.
- 355 ▪ Gather and analyze data. Manufacturers will be requested to test their latest, most feature-rich  
356 models using the new test procedure. The data gathered from this testing will be used to determine  
357 an appropriate performance metric and to inform initial levels for the new ENERGY STAR TV  
358 specification.
- 359 ▪ Share drafts of the specification with stakeholders for their review and comment. EPA expects to  
360 distribute an initial draft of this specification in August 2006, and develop and distribute additional  
361 drafts as needed, prior to the development of the final version of this document.
- 362 ▪ Host stakeholder meetings and workshops. Stakeholder participation is critical to developing a  
363 meaningful specification and to the overall success of ENERGY STAR. EPA will invite all interested  
364 parties to attend periodic meetings and/or workshops designed to vet key elements of the  
365 specification.
- 366 ▪ Finalize specification. EPA intends to finalize the TV specification by January 2007 and expects that it  
367 will take effect in or around January 2008. The current TV/VCR products specification will remain in  
368 place until a new set of specifications can be finalized with a new effective date.

370 A timeline follows below with anticipated dates for key events milestones in the ENERGY STAR TV  
371 specification revision.

372 **Table 5: Anticipated Timeline for ENERGY STAR TV Specification Revision**

| Date            | Event  |
|-----------------|--|
| February 2006   | Finalize Television Market and Industry Research   |
| Late March 2006 | Complete draft test procedure for televisions and share with stakeholders  |
| April 2006      | Host stakeholder workshop to discuss Draft test procedure  |
| April/May 2006  | Finalize test procedure for televisions  |
| May – July 2006 | Test latest, most feature-rich models using newly developed test procedure. Interested manufacturers share data with EPA   |
| June 2006       | Attend meeting with international stakeholders in London to discuss progress to date regarding televisions; timed to coincide with Energy Efficiency in Domestic Appliances and Lighting (EEDAL 2006)<br>Attend Society for Information Display (SID) conference, SID 2006, in San Francisco |
| Late July 2006  | Conduct stakeholder meeting to discuss data gathered to date   |
| August 2006     | Release Draft 1 specification for comment and feedback   |
| September 2006  | Host stakeholder meeting to discuss Draft 1 specification  |
| November 2006   | Release Draft 2 specification for comment and feedback   |
| December 2006   | Host stakeholder meeting to discuss Draft 2 specification  |
| January 2007    | Release final revised ENERGY STAR TV specification   |
| January 2008    | Effective date of revised specification  |

374  
375 Additional information about EPA's ENERGY STAR Product Specification Development activities can be found  
376 at [www.energystar.gov/productdevelopment](http://www.energystar.gov/productdevelopment).

377

378 **Sources**  
379  
380 About TV, <http://tv.about.com/od/glossary/> and <http://tv.about.com/od/learningcenter/bb/buyingtv.htm>  
381  
382 CNET, [www.cnet.com](http://www.cnet.com)  
383  
384 CNET Australia, [www.cnet.com.au](http://www.cnet.com.au)  
385  
386 Corning, [www.corning.com/lcdtv](http://www.corning.com/lcdtv)  
387  
388 Consumer Electronics Association Press Release, dated June 8, 2005, "New Data Shows Analog  
389 Broadcasting Cut-off Will Impact Few US TV Sets and Homes"  
390  
391 Crutchfield Advisor, [www.crutchfieldadvisor.com](http://www.crutchfieldadvisor.com)  
392  
393 Digitimes, [www.digitimes.com](http://www.digitimes.com)  
394  
395 DLPs, [www.dlp.com](http://www.dlp.com)  
396  
397 Instant Free Info, [www.instant-free-info.com](http://www.instant-free-info.com)  
398  
399 iSuppli, "LCD TV Shipments Soar – Will They Bring Early Demise of CRT TVs," – Television Systems Market  
400 Tracker, Q4 2005  
401  
402 The Natural Resource Defenses Council (NRDC), "Tuning in to Energy Efficiency: Prospects for Saving  
403 Energy in Televisions"  
404  
405 Niche Articles, [www.niche-article-rss.com](http://www.niche-article-rss.com)  
406  
407 Nielsen Media Research, <http://www.nielsenmedia.com/newsreleases/2005/AvgHoursMinutes92905.pdf>  
408  
409 Plasma TV Buying Guide, [www.plasmatvbuyingguide.com](http://www.plasmatvbuyingguide.com)  
410  
411 USA Today Survey of the Number of Televisions in a US Household (August 2005 phone survey of 1,005  
412 adults ages 18 and over by Frank N. Magid Associates)