



Australian Government

**Department of the Environment,
Water, Heritage and the Arts**



www.energyrating.gov.au
EQUIPMENT ENERGY EFFICIENCY

Baseline TV Power Consumption 2009

*Prepared for
Department of the Environment, Water,
Heritage and the Arts*

September 2009



655 Jacksons Track
Jindivick, Victoria 3818
Australia
ABN: 18 090 579 365
Tel: +613 5628 5449
Fax: +613 9923 6175
Email: info@energyconsult.com.au

Contents

<i>Introduction</i>	<i>1</i>
Objective	1
Methodology	1
Purchased TVs	1
Voluntary Labelling Program Tested TVs	2
Analysis Approach	2
<i>TV Sales – 2008 & April 2009</i>	<i>4</i>
<i>TV Characteristics and Results</i>	<i>6</i>
<i>Test Results</i>	<i>10</i>
Power Consumption	10
Star Rating	11
Price Relationship	15
Annual Energy Consumption	17
<i>Comparison with Previous TV Tests</i>	<i>19</i>
<i>Sales Data of Measured TVs</i>	<i>20</i>
<i>Summary and Conclusions</i>	<i>23</i>
Summary	23
Conclusions	24
<i>References</i>	<i>26</i>
<i>Appendix 1: Details of All TVs Tested (not Published)</i>	<i>27</i>

List of Figures

Figure 1: Sales of TVs by Screen Size and Display Type April 2009	4
Figure 2: Sales of TVs by Size Category and Screen Type 2008	5
Figure 3: TVs Labelled – Power, Energy Consumption and Resolution by Type	8
Figure 4: Power Consumption by Screen Area & Screen Type (On-Mode, Watts)	10
Figure 5: Power Consumption by Screen Area & Screen Type, Resolution (On-Mode, Watts)	11
Figure 6: Average Star Rating: LCD TVs - Labelled vs Non-Labelled	12
Figure 7: Average Star Rating: Plasma TVs - Labelled vs Non-Labelled	12
Figure 8: Number of Models by Star Rating and Year of Release to Market	13
Figure 9: Number of Plasma Models by Star Rating and Year of Release to Market	14
Figure 10: Number of LCD Models by Star Rating and Year of Release to Market	14
Figure 11: Price by On-Mode Power – Full HD, 40" – 52" Screen Size	15
Figure 12: Average Price by Star Rating and Release Year, Full HD, 42"	16
Figure 13: Price x Star Rating and Release Year, All Resolutions, 46"- 52"	16
Figure 14: TV Annual Energy Consumption by Type – Non-Labelled and Labelled TVs	17
Figure 15: Comparison of LCD and Plasma TV Power by Screen Area in 2007 and 2009	19
Figure 16: Star Rating of Tested TVs (>32") – Screen Area and April 09 Sales (bubble)	21
Figure 17: Sales (April 09) by Star Rating and Screen Type – Tested TVs >32" Screen Area	22

List of Tables

Table 1: Total Sales of TVs - April 2009 and Annual 2008	4
Table 2: TVs Purchased for Testing – Power, Energy Consumption and Resolution by Type	7
Table 3: Proportion (%) of TVs Tested of Total April 2009 Sales – Labelled and Non-Labelled	20

Introduction

This baseline power consumption study examines the results of over 80 Plasma and LCD TVs tested under the new Australia New Zealand Standard AS/NZS 62087.1(Int). It provides a snapshot of the power consumption, Energy Labelling characteristics and sales (where available) of TVs during the introduction of the Voluntary Energy Labelling program and before the introduction of Mandatory Energy Labelling and MEPS for TVs.

Objective

To obtain power consumption characteristics for LCD and Plasma TVs during the introduction of the Voluntary Labelling Scheme and before the introduction of the planned mandatory MEPS and Energy Labelling program.

Methodology

The TVs sourced for this study were all tested in an independent laboratory to interim Australian/New Zealand Standard AS/NZS 62087.1(Int). Models were selected from the DEWHA/E3 assisted test program for industry that was available for suppliers who participated in the Voluntary TV Labelling program (E3 2008a). In addition, 37 TVs were purchased from retailers and tested to AS/NZS 62087.1(Int).

According to the data sourced from GfK Australia, the models selected for this study represented 40% of the sales of all TVs 32 inch and above during the month of April 2009.

Purchased TVs

The TVs that were purchased and tested to AS/NZS 62087.1(Int) were selected on the basis of being popular brands/models that were not labelled for the voluntary Energy Rating Label scheme. Where possible the GfK sales data (GfK 2009) was used to determine which brands/models have the largest market share and TVs were selected, sourced and purchased accordingly. The availability of selected model/brands was limited due to the timing of the purchasing coinciding with the end of financial year sales and the fact that many stores do not hold older stock (that was less likely to be Voluntary Energy Labelled).

Considering these limitations, the models purchased for this baseline testing study represented over 30% of the total TV sales for the month of April 2009 of all TVs 32" and above.

The screen size of 32" and above was determined as representing the most popular size TVs and most likely used as the main TV for the household. Ten 32", seven 42", two 46" and one 40" LCD TVs were purchased. The Plasma TVs purchased comprised: one 32", six 42", nine 50" and one 60" TV.

The TVs were purchased from a variety of retail and online stores and delivery arranged to the Australian Digital Testing (ADT) lab in Sydney. The purchase date, invoice/receipt, location, store name, delivery method and delivery receipt details were recorded. The stores were not informed of the purpose of the TV purchases.

EnergyConsult liaised with ADT to guarantee the delivery and storage of the TVs, ensure that the tests were undertaken with adequate procedures, record the model details and features, time and date and the test results. The TVs are stored at ADT for up to six months so that further testing can be undertaken if required.

As the test reports were received from ADT they were collated ensuring that the information provided meet the requirements of the AS/NZS62087.1 (Int):2009 and can be used to calculate the Energy Rating in accordance with AS/NZS62087.2.2 (Int):2009.

Voluntary Labelling Program Tested TVs

In addition to the 37 TVs purchased, the results of tests were analysed for 40 models that were provided by suppliers for testing to ADT according to the Voluntary Labelling Scheme over the period up to July 2009. All of these models were labelled and about 50% of these were sold in the market during April 2009.

Analysis Approach

The test data was analysed along with other characteristics for the particular model. The data from the tests of the TVs included:

- Out-of-the-box mode
- Calculated Screen Area 2765.00 cm²
- Calculated Screen Diagonal 80.4 cm
- Luminance of Out-of-the-box mode
- Luminance of brightest mode
- Luminance Ratio
- Passive Standby Power
- Time in Passive Standby
- Standby Power Factor
- Active Standby Power
- Time in Active Standby
- Active Standby Power Factor
- Time in On-Mode (10.0 hours)
- On-Mode Power
- On-Mode Power Factor
- Base Load (BEC)
- Projected Annual Energy Consumption (PAEC)

- Comparative Energy Consumption (CEC)
- Star Rating Index (SRI)
- Star Rating.

Other parameters were also recorded including; display type, model/serial number, stated screen diagonal and test setup. All test data was compiled and calculations checked.

The models were also matched with other characteristics, including:

- the sales for the month of April 2009
- month of release to the market
- screen resolution
- purchase price/best available retail price.

The analysis parameters reported in this baseline study include:

- Total Sales of TVs by type for 2008 and the month of April 2009
- Power consumption of the TVs by type and screen area, including average and frequency distribution by model
- Star Rating by type and screen area, including average and frequency distribution by model
- Star Rating by year of release to the market by TV type
- Annual Energy Consumption of TVs by type and screen area, including average and frequency distribution by model
- Power consumption of TVs compared to previous tests from 2007
- Sales analysis by TV type, star rating, and screen area in comparison with April 2009 total sales.

TV Sales – 2008 & April 2009

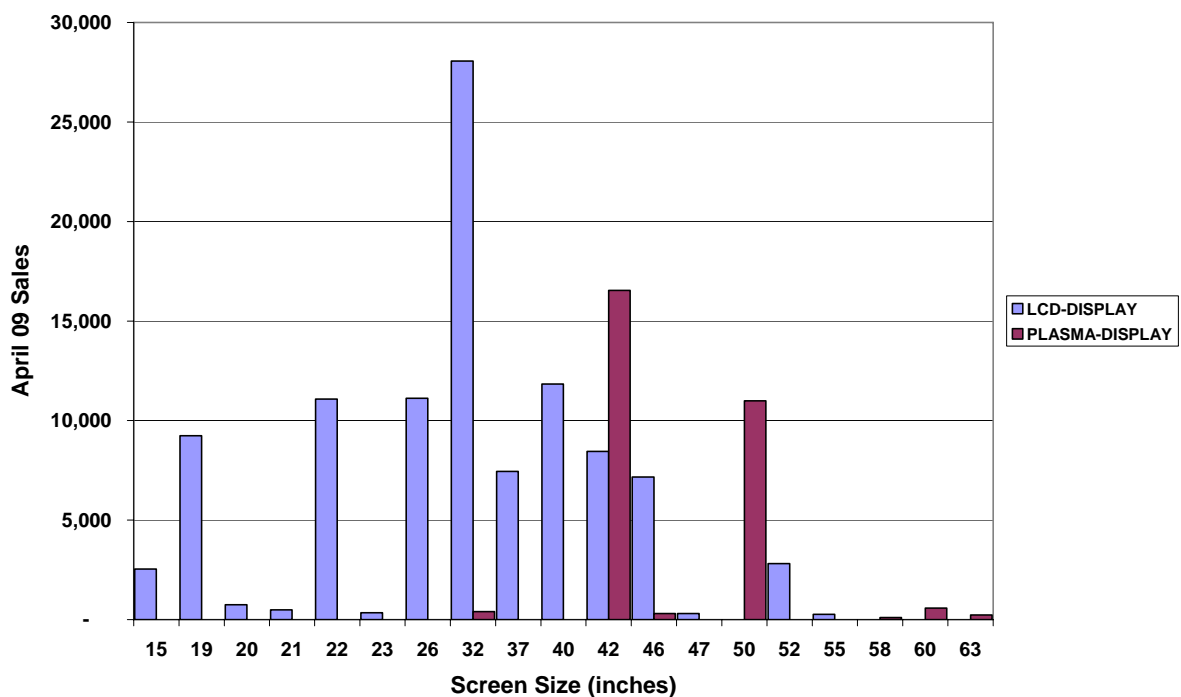
Individual TV sales data by model were sourced from GfK Australia in April 2009 to assist in the selection of TV samples. In April 2009 almost 150,000 TVs were sold in Australia, while total sales were estimated to be 2.4 Million in 2008 (GfK 2009).

Table 1: Total Sales of TVs - April 2009 and Annual 2008

Display Type	Latest Month Sales (April 2009)	Annual Sales (2008)
LCD	108,000	1,400,000
Plasma	30,000	555,000
CRT	10,000	466,000
Total	148,000	2,421,000

The majority of TVs sold in April 2009 in Australia were LCD with 72% of the market; with plasma TVs and CRT with 21% and 7 % of sales respectively. **Figure 1** shows the sales of LCD and Plasma TVs by screen size.

Figure 1: Sales of TVs by Screen Size and Display Type April 2009

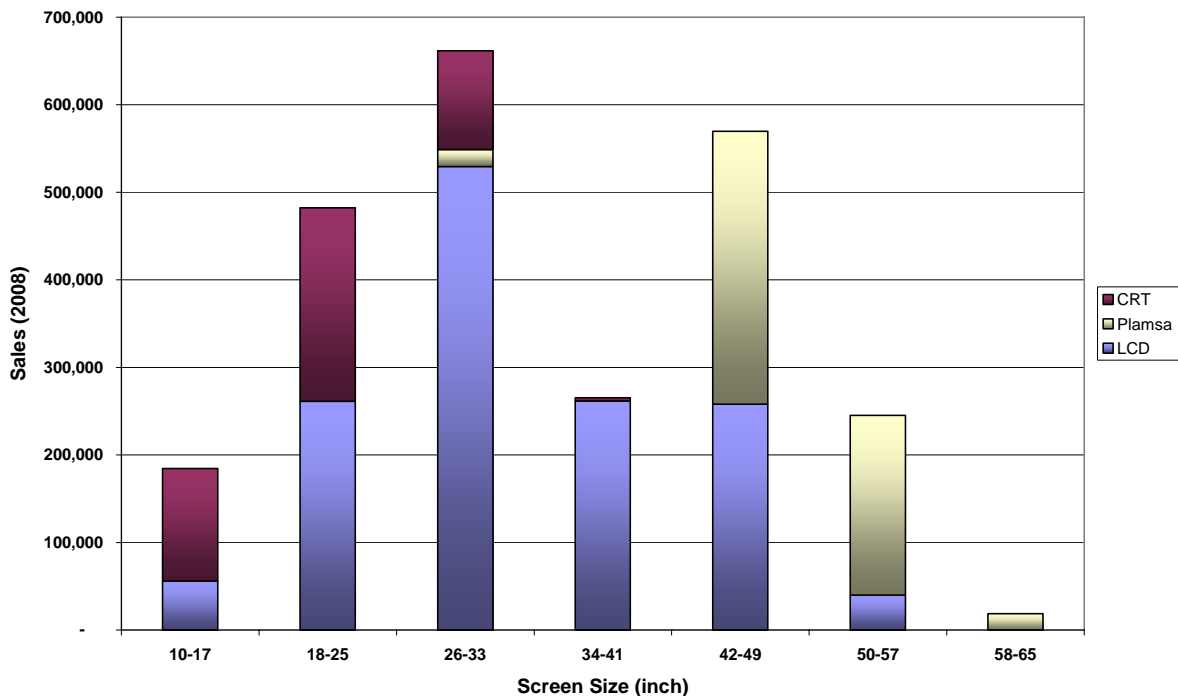


For the market above 32 inch (81 cm) diagonal screen size, a total of 98,000 TVs were sold in April 2009. Almost all these were Plasma and LCD TVs, with less than 10 being CRT TVs. As the vast majority of TV sales are 32" and above this testing and baseline

study focused on TVs of greater than 32” screen size. Also, these TVs are most likely to be used as the main TV in the household,

During 2008, the two most common sizes of TVs sold were the 32” and 42”, with approximately 400,000 units sold in each category. **Figure 2** shows the estimated sales of TVs by size, category and screen type. Surprisingly, the sales of CRT TVs were quite significant in the smaller size categories, with over 150,000 21” CRT TVs sold in 2008. However, this market segment represents small very low cost TVs, used in bedrooms and as monitors for games consoles.

Figure 2: Sales of TVs by Size Category and Screen Type 2008



Source: GfK 2009

TV Characteristics and Results

The TVs utilised in this study were purchased directly from retailers and obtained from suppliers who participated in the Voluntary Energy Labelling program. To obtain the most representative sample of TVs without Voluntary Energy Labels, 37 TVs were purchased. The energy/power and other characteristics of the TVs purchased are shown in **Table 2**. TVs with the highest sales in April 2009, or 2008 that were still available on the market were selected for testing. Other identifying characteristics of the TVs, such as model/brand, sales or rank are not displayed.

The TVs provided by suppliers for testing to enable their participation in the Voluntary Energy Labelling Program are shown in **Figure 3**. Again, the identifying characteristics of the TVs, such as model/brand, sales or rank are not displayed.

Table 2: TVs Purchased for Testing – Power, Energy Consumption and Resolution by Type

Type	On Mode Power (W)	Annual Energy Consumption (kWh pa)	Stars	Screen Resolution	Release Year
Plasma	187	682	2.5	1024 x 768	2009
Plasma	260	954	1	1024 x 768	2008
Plasma	277	1,012	2	1366 x 768	2009
Plasma	261	954	2.5	1366 x 768	2009
Plasma	186	679	2.5	1024 x 768	2009
Plasma	375	1,372	1	1920 x 1080	2007
Plasma	247	903	1	1920 x 1080	2008
Plasma	232	850	1.5	1920 x 1080	2008
Plasma	331	1,213	1.5	1920 x 1080	2008
Plasma	340	1,245	1	1920 x 1080	2009
Plasma	319	1,165	1.5	1920 x 1080	2008
Plasma	405	1,482	2	1920 x 1080	2008
Plasma	240	879	3	1366 x 768	2008
Plasma	255	936	1	1024 x 768	2009
Plasma	277	1,014	2	1366 x 768	2009
Plasma	417	1,526	0	1920 x 1080	2007
Plasma	149	547	1.5	852 x 480	2007
LCD	120	439	2.5	1920 x 1080	2008
LCD	203	746	2	1920 x 1080	2008
LCD	112	411	2.5	1366 x 768	2008
LCD	199	729	2.5	1920 x 1080	2008
LCD	212	778	2	1920 x 1080	2008
LCD	134	493	2	1366 x 768	2008
LCD	94	352	3.5	1366 x 768	2008
LCD	188	689	2.5	1920 x 1080	2008
LCD	90	330	3.5	1920 x 1080	2009
LCD	180	663	2.5	1366 x 768	2008
LCD	207	759	3	1920 x 1080	2008
LCD	176	645	2.5	1920 x 1080	2008
LCD	160	587	4	1920 x 1080	2008
LCD	169	621	3	1920 x 1080	2008
LCD	192	705	2.5	1920 x 1080	2008
LCD	148	542	1.5	1366 x 768	2007
LCD	150	551	1.5	1920 x 1080	2008
LCD	84	310	4	1366 x 768	2009
LCD	79	303	4	1366 x 768	2009
LCD	122	450	2.5	1366 x 768	2008

Figure 3: TVs Labelled – Power, Energy Consumption and Resolution by Type

Type	On Mode Power (W)	Annual Energy Consumption (kWh pa)	Stars	Screen Resolution	Release Year
Plasma	165	605	3	1024 x 768	2009
Plasma	234	857	3	1366 x 768	2009
Plasma	226	826	3	1365 x 768	2009
Plasma	165	605	3	1024 x 768	2009
Plasma	257	943	1	1024 x 768	2008
Plasma	265	973	1	1024 x 768	2008
Plasma	340	1,243	1.5	1920 x 1080	2009
Plasma	153	533	3.5	1024 x 768	2009
Plasma	183	670	2.5	1024 x 768	2008
LCD	102	373	3	1920 x 1080	2009
LCD	88	322	4	1920 x 1080	2009
LCD	77	282	3	1366 x 768	2008
LCD	36	136	4.5	1440 x 900	2008
LCD	40	151	5	1680 x 1050	2008
LCD	71	262	4.5	1366 x 768	2009
LCD	181	664	3.5	1920 x 1080	2009
LCD	113	416	2.5	1920 x 1080	2009
LCD	159	583	3.5	1920 x 1080	2009
LCD	206	756	4	1920 x 1080	2009
LCD	130	476	2	1920x1080	2008
LCD	205	752	2	1920 x 1080	2008
LCD	275	1,009	1.5	1920 x 1080	2007
LCD	110	404	4.5	1920 x 1080	2008
LCD	197	725	4.5	1920 x 1080	2008
LCD	221	810	3.5	1920 x 1080	2008
LCD	70	257	3.5	1366 x 768	2009
LCD	82	299	4	1366 x 768	2009
LCD	99	364	4.5	1920 x 1080	2009
LCD	240	881	3.5	1920 x 1080	2008
LCD	81	297	4	1366 x 768	2009
LCD	67	247	5	1366 x 768	2009
LCD	83	309	2.5	1366 x 768	2009
LCD	61	228	4	1366 x 768	2009
LCD	73	268	3.5	1366 x 768	2008
LCD	92	338	3.5	1366 x 768	2009
LCD	73	275	3	1366 x 768	2008
LCD	152	558	3.5	1920 x 1080	2009
LCD	85	318	4	1366 x 768	2008
LCD	116	428	4.5	1920 x 1080	2009

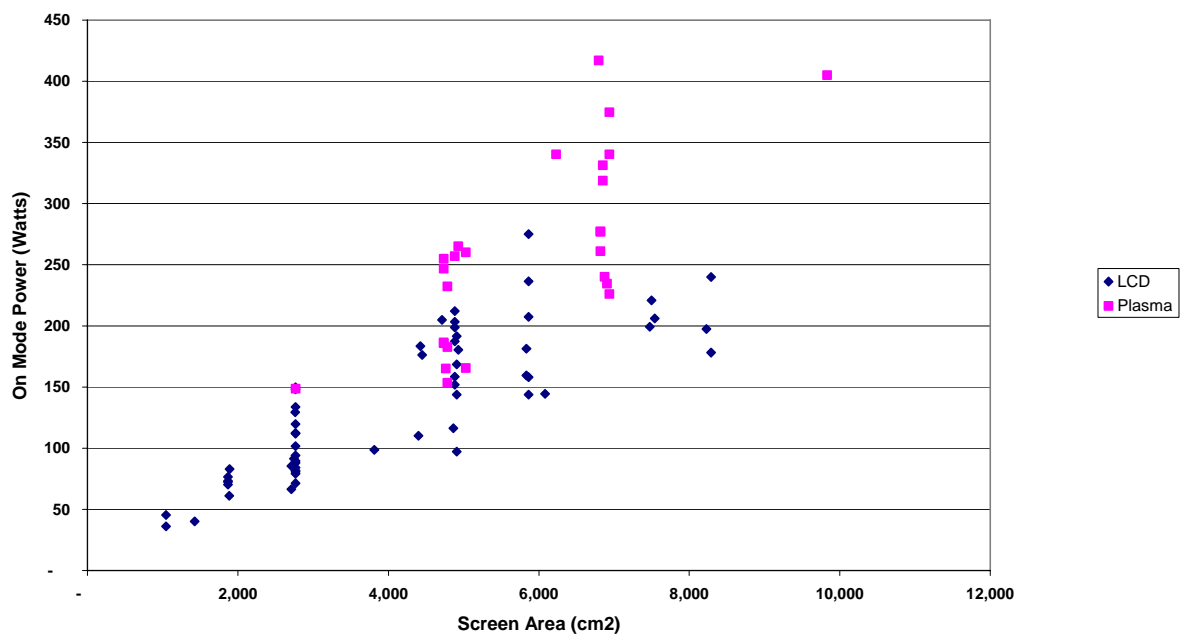
Type	On Mode Power (W)	Annual Energy Consumption (kWh pa)	Stars	Screen Resolution	Release Year
LCD	144	531	4.5	1920 x 1080	2009
LCD	97	358	5.5	1920 x 1080	2009
LCD	144	527	4.5	1920 x 1080	2009
LCD	184	674	2	1920 x 1080	2008
LCD	236	870	2	1920 x 1080	2008
LCD	46	173	3.5	1440 x 900	2008
LCD	144	527	4.5	1920 x 1080	2009
LCD	158	579	4	1920 x 1080	2009
LCD	199	730	4	1920 x 1080	2009
LCD	178	654	5	1920 x 1080	2009

Test Results

Power Consumption

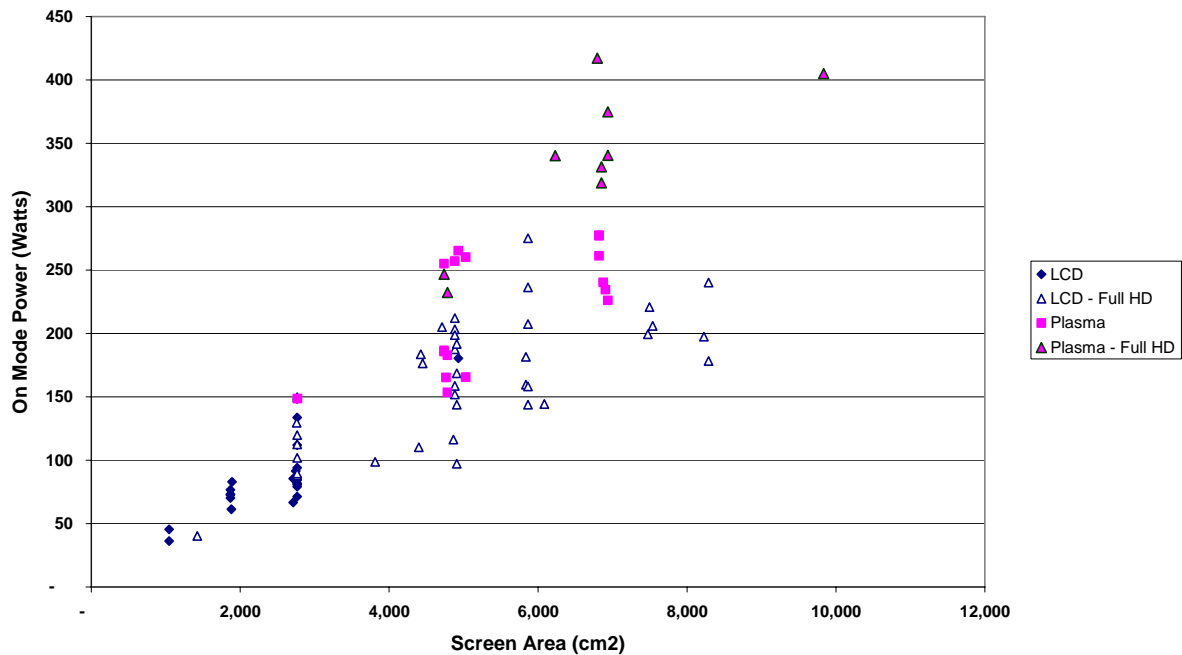
The power consumption for On-Mode (Watts) is shown in **Figure 4**, with the range for Plasma TVs from 150 Watts to over 400 Watts. LCD TVs within the larger 42" and above screen size range from 100 Watts to 275 Watts.

Figure 4: Power Consumption by Screen Area & Screen Type (On-mode, Watts)



The power consumption for TVs was further segmented into those with Full-HD resolution (greater than 1920 x 1080 pixels) and by screen display type (LCD vs Plasma). **Figure 5** shows the same diagram as above, but with the Full-HD TVs identified as triangles in the scatter plot. The power consumption of the large (50" and above) Full-HD Plasma TVs tested is greater than the standard resolution Plasma TV of a comparable screen size. However, the power consumption for some 42" Full-HD Plasma TVs was lower than some lower resolution Plasma TVs. Almost all the larger screen LCD TVs were Full-HD and their power consumption was generally lower than the Full-HD Plasma TVs of comparable screen size.

Figure 5: Power Consumption by Screen Area & Screen Type, Resolution (On-mode, Watts)



Star Rating

The average star rating for LCD TVs without labels was 2.6 stars, while those labelled averaged 3.7 Stars, as shown in **Figure 6**. The average star rating for Plasma TVs without labels (purchased) was 1.6 stars, while those with labels average 2.4 stars, as shown in **Figure 7**.

The figures clearly show that models labelled under the Voluntary Energy Labelling program were more efficient than those models that were not labelled. This suggests that manufacturers who voluntarily chose to participate in the program were doing so as they generally have more efficient models on the market. This reaction to the Voluntary Energy Labelling program was not unexpected, as the suppliers who have more efficient TVs would be able to use the labelling program for their competitive advantage. After the mandatory program is introduced, consumers will have more comprehensive information and be able to use the label to more effectively compare model efficiency.

Figure 6: Average Star Rating: LCD TVs - Labelled vs. non-Labelled

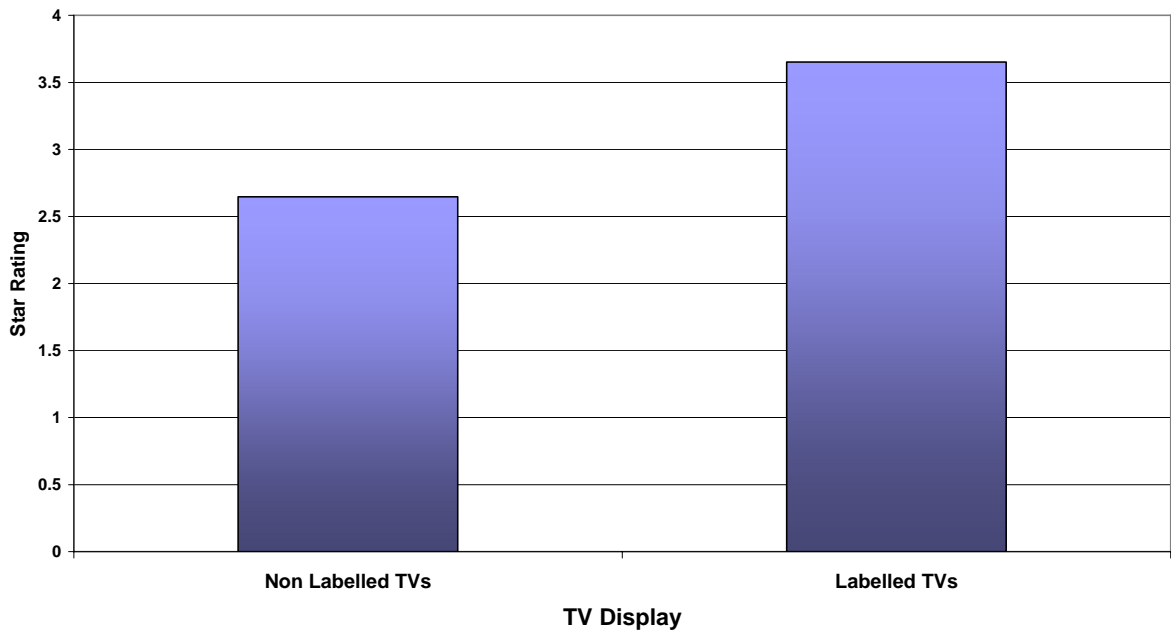
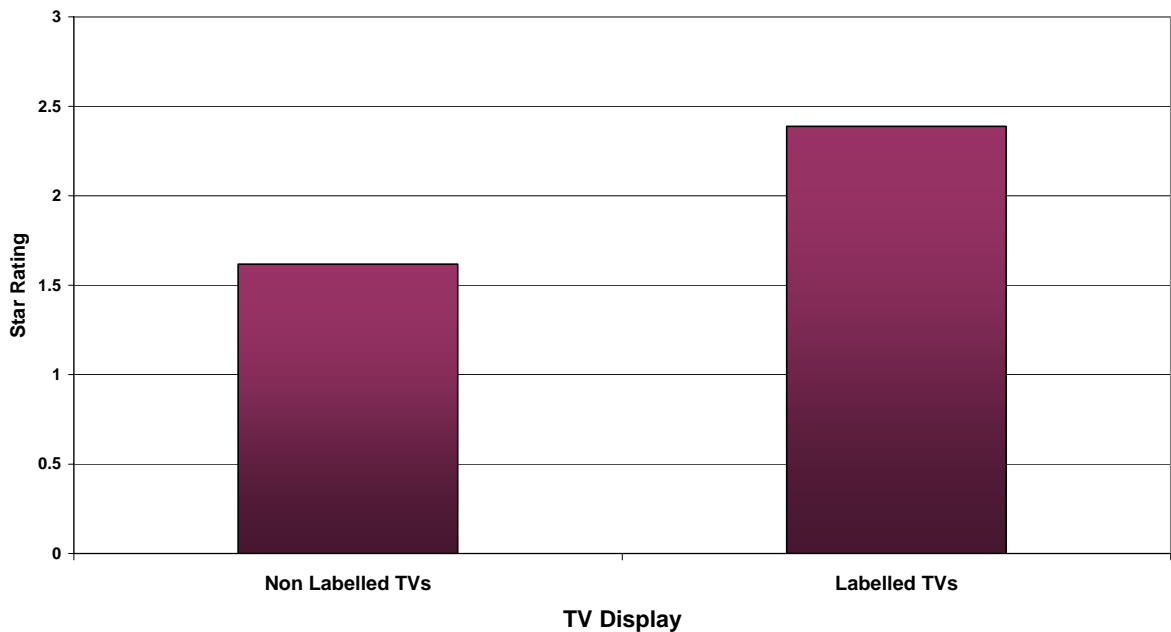


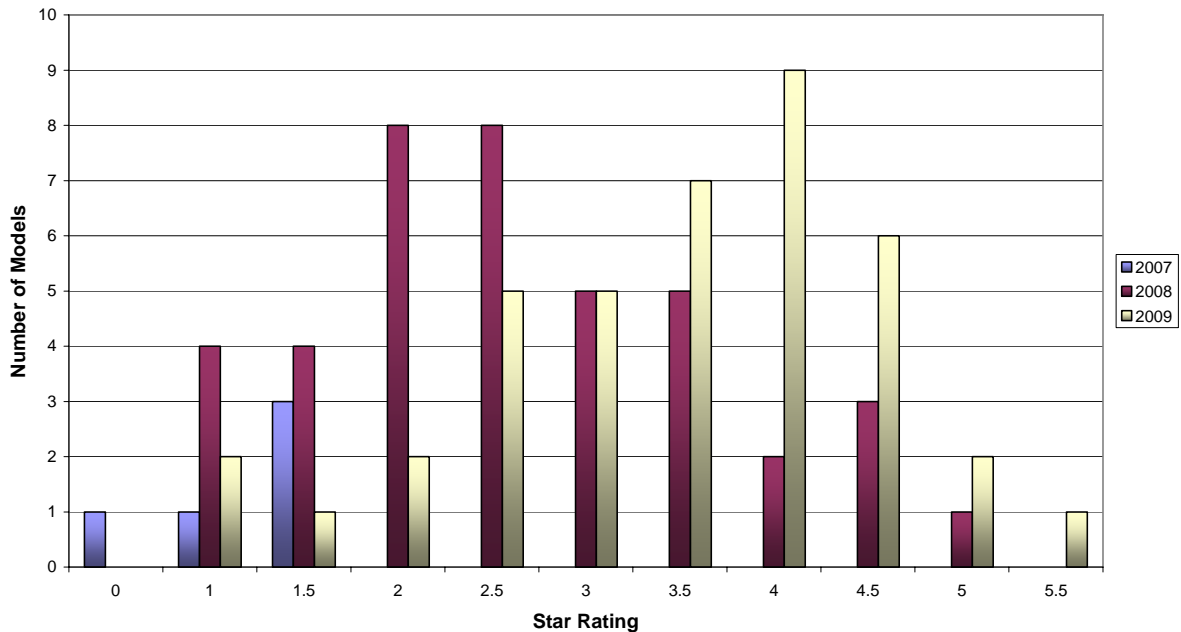
Figure 7: Average Star Rating: Plasma TVs - Labelled vs. non-Labelled



The baseline study was also interested in exploring if Star Ratings have improved over time, by comparing the number of models and their Star Rating with the year the model was released to the market. **Figure 8** illustrates the number of models tested and the resulting Star Rating by year of release to the market. Over the period 2007 to 2009, it

shows the gradual increase, in the number of models with higher star ratings for the models sampled in this study.

Figure 8: Number of Models by Star Rating and Year of Release to Market



To examine the trend over time by *display type*, **Figure 9** shows that the number of Plasma TVs models with higher star ratings increased in 2009 and similarly, **Figure 10** shows that the number of higher star rating LCD TVs models also increased. The general increase in available models with higher star ratings is evident from 2008 to 2009 where the sample size is larger.

Figure 9: No of Plasma Models by Star Rating and Year of Release to Market

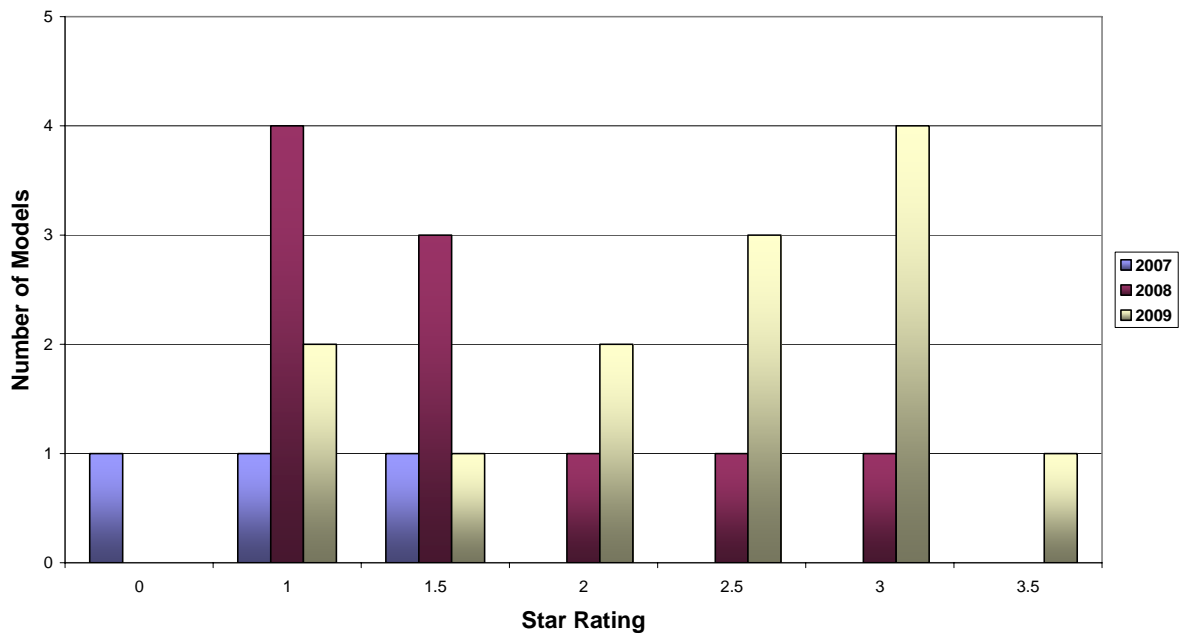
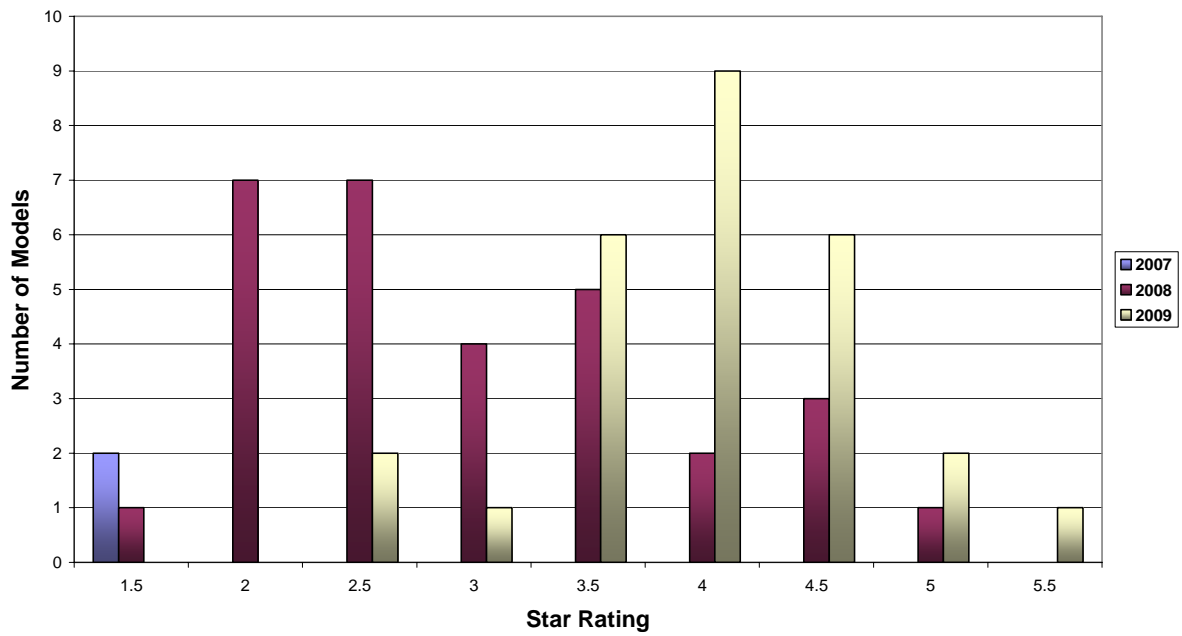


Figure 10: No of LCD Models by Star Rating and Year of Release to Market

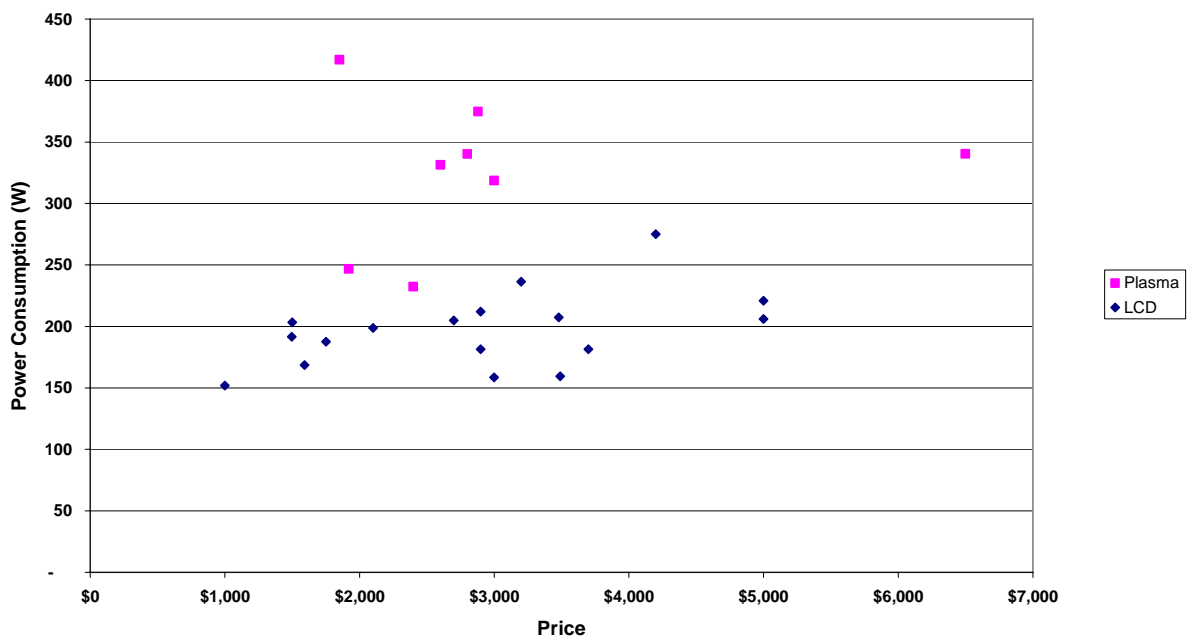


Price Relationship

The Consultation Regulatory Impact Statement (RIS) conducted for E3 in 2008 (E3 2008b) examined the relationship between television price and energy efficiency. This is important for conducting cost–benefit analysis, as the consumer may pay extra for more efficient TVs. This is shown as a *cost* in the analysis which is then compared to the energy savings *benefits* of the more efficient TV. The RIS assumed that there is no additional cost to the consumer for TVs meeting the Tier 1 Minimum Energy Performance Standard (MEPS) level and a \$100 extra cost for Tier 2 (3 Star level) MEPS.

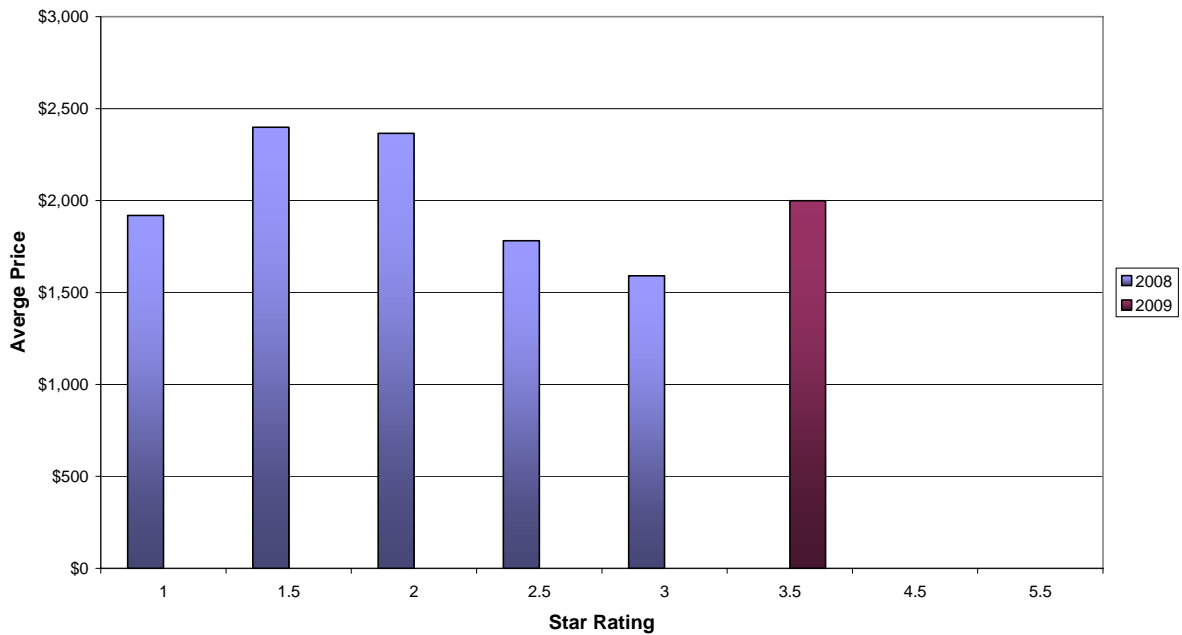
To examine the price vs efficiency relationship, **Figure 11** shows the retail price vs. power consumption for the TVs measured in this study, using the popular Full-HD 40” – 52” screen size range. The figure suggests there is no relationship between the price of the TV and power consumption. There does appear to be a general trend towards LCD TVs using less power compared to Plasma TVs; however, **Figure 11** shows two Full-HD Plasma TVs with power consumption and price similar to the Full HD LCD TVs.

Figure 11: Price by On Mode Power – Full HD, 40” – 52” Screen Size



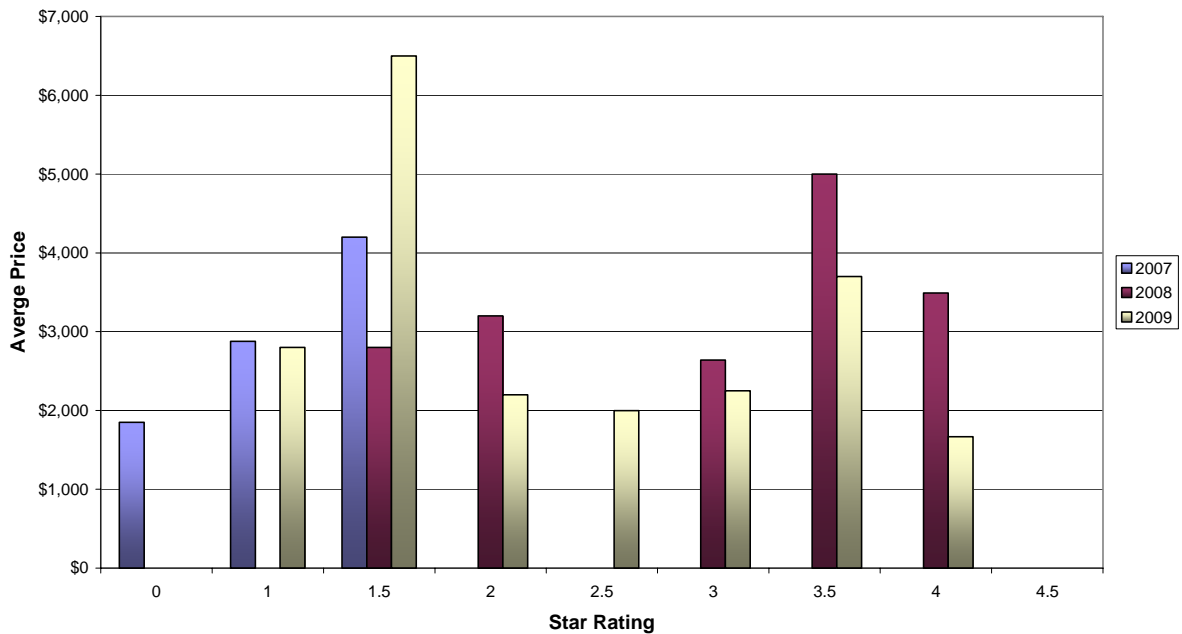
The data presented in **Figure 12** for Full HD 42” TVs shows the generally decreasing price by Star Rating for 2008, while in 2009 the average price for a 3.5 Star Full HD 42” TV was \$2000 (with only a small sample of models with price available). The data obtained to-date demonstrates that Full HD TVs are capable of higher star ratings with little impact on the price of the TV.

Figure 12: Average Price by Star Rating and Release Year, Full HD, 42"



The data presented in **Figure 13** for larger TVs (46” – 52” screen size) shows a decreasing average price over the last three years for all Star Rating cohorts except for 1.5 stars (which is distorted by a single expensive unit). Again, it appears that TVs are improving in efficiency over time with decreasing costs.

Figure 13: Price x Star Rating and Release Year, All Resolutions, 46"- 52"



Annual Energy Consumption

The Annual Energy Consumption by TV type is shown in **Figure 14** for all the Labelled and Non-Labelled TVs. All TVs except one meet the proposed MEPS Tier 1 level of 1 Star.

Figure 14: TV Annual Energy Consumption by Type – Non-Labelled and Labelled TVs

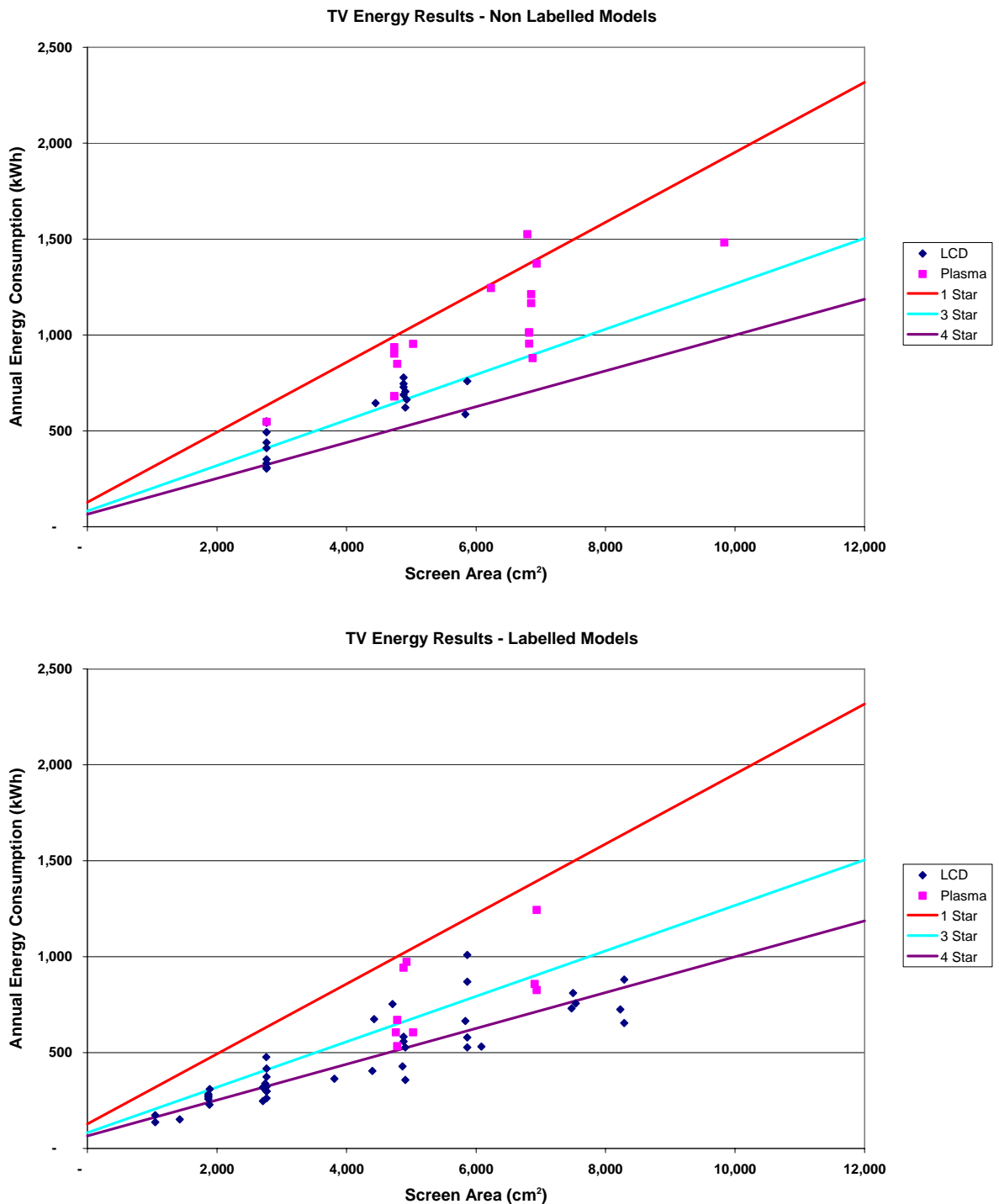


Figure 14 clearly demonstrates that the Labelled TVs (which were released in late 2008 and 2009) are more efficient than those without labels. This trend provides an early indication of the potential impact MEPS and Energy Star Labelling would have on TVs. If this trend continues over the next year, we could expect the majority of TVs to achieve 3 Stars or more in 2010.

Comparison with Previous TV Tests

In Australia and internationally, measurements of TV power consumption have been conducted over the last three years to develop the new *International Electrotechnical Commission's* (IEC) test for TVs (IEC 62087). The first large scale survey of Australian TVs to the same test pattern and conditions that were adopted by the IEC 62087 were conducted in April 2007. These measurements provide data on the range and spread of TV power consumption two years ago and can potentially show trends in average power consumption over time.

Figure 15 illustrates the on-mode power consumption of TVs by screen area from tests conducted in 2007 (in clear diamond and square points) with the current measurements in 2009 (shown as filled diamonds and square points).

Figure 15: Comparison of LCD and Plasma TV Power by Screen Area in 2007 and 2009

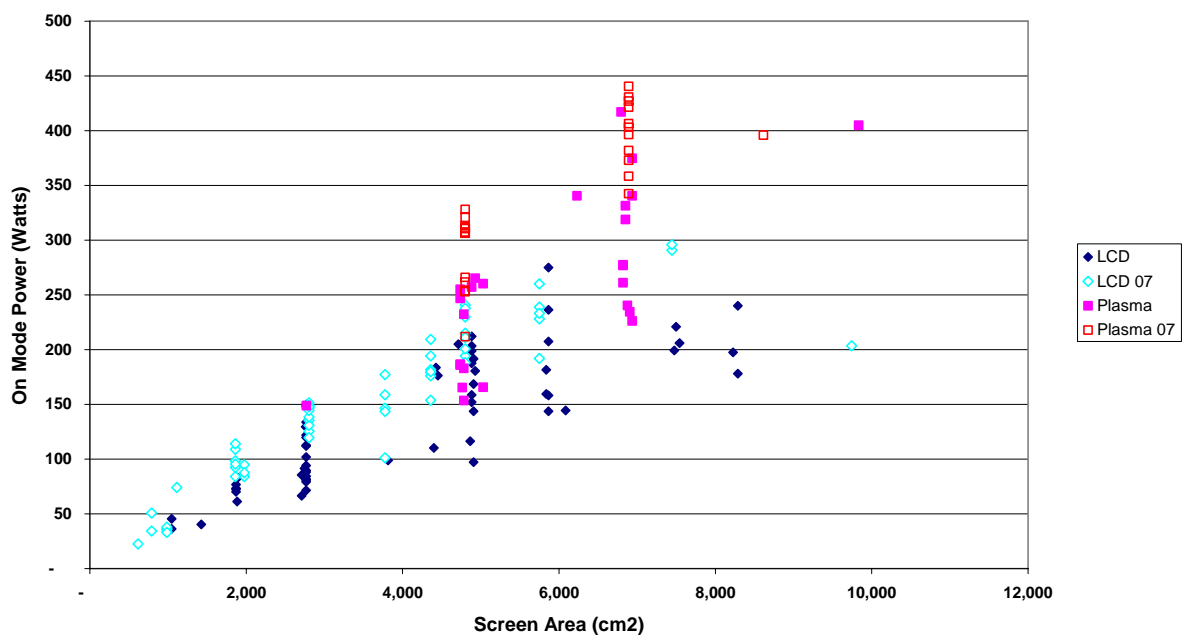


Figure 15 shows a significant reduction in the power consumption of TVs over the last two years, with the majority of 42" Plasma TVs now in the 150 to 250 Watts range compared to those measured in 2007 consuming from 250 to 350 Watts. For LCD TVs the lowest power consumption was around 180 Watts for the 42" screen size in 2007, while the lowest measured 42" LCD was just under 100 Watts in 2009. Closer analysis of the data indicates an average reduction in power consumption of between 25% to 33% for TVs in the 42" and 46 to 52" size range, over the last two years.

Sales Data of Measured TVs

Sales of the various TVs obtained for testing and those measured as part of the Voluntary Energy Labelling program provided an important aspect in the analysis of TV power consumption for this study. With sales data (for April 2009) matched to the measured results, the proportion of TVs sold by Star Rating can be assessed. Although not all models in the market during April 2009 were measured, the tested TVs represented approximately 40% of the all TVs above 32" screen size sold in Australia during that period.

The proportion of TVs tested, relative to total sales for April 2009, is shown in **Table 3**. Of the 98,000 TVs sold in April, 13% of models tested had Voluntary Energy Labels while those with no Energy Labels represented 27% of the month's sales. This provides a good snapshot of the market for TVs and baseline power consumption during the Voluntary Energy Labelling program and before the introduction of the MEPS. This study does not provide an accurate measure of sales weighted power consumption, as the power consumption of approximately 80% of the sales for the month would be required; however, the sample does enable a valuable assessment to be made.

Table 3: Proportion (%) of TVs Tested of Total April 2009 Sales – Labelled and Non-Labelled

TV Display	Total Sales (Apr 09)	Percent Tested - Labelled	Percent Tested - Non Labelled	Percent Tested - Total
LCD	68,700	15.5%	19.6%	35.0%
Plasma	30,500	7.7%	43.1%	50.8%
Total	98,200	13.1%	26.9%	39.9%

For TVs with a screen size of 32" and above, a 'bubble' chart is shown in **Figure 16**, showing the volume of sales according to screen type, screen area, and star rating. This figure shows the sales of the tested TVs (by the size of the bubble) and their corresponding Star Rating and screen size for both Plasma and LCD screen types. The largest bubble in each of the charts is approximately sales of 3000 units.

Figure 16 shows that the average Star Rating of tested Plasma TVs sold in April 2009, was between 1 to 2.5 Stars, while average Star Rating of LCD TVs was between 1.5 to 4.5 Stars. Interestingly the sales of more efficient LCD TVs declined with higher Star Ratings for the 32" (2765 cm²screen area) screen size.

Figure 16: Star Rating of Tested TVs (>32") – Screen Area and April 09 Sales (bubble)

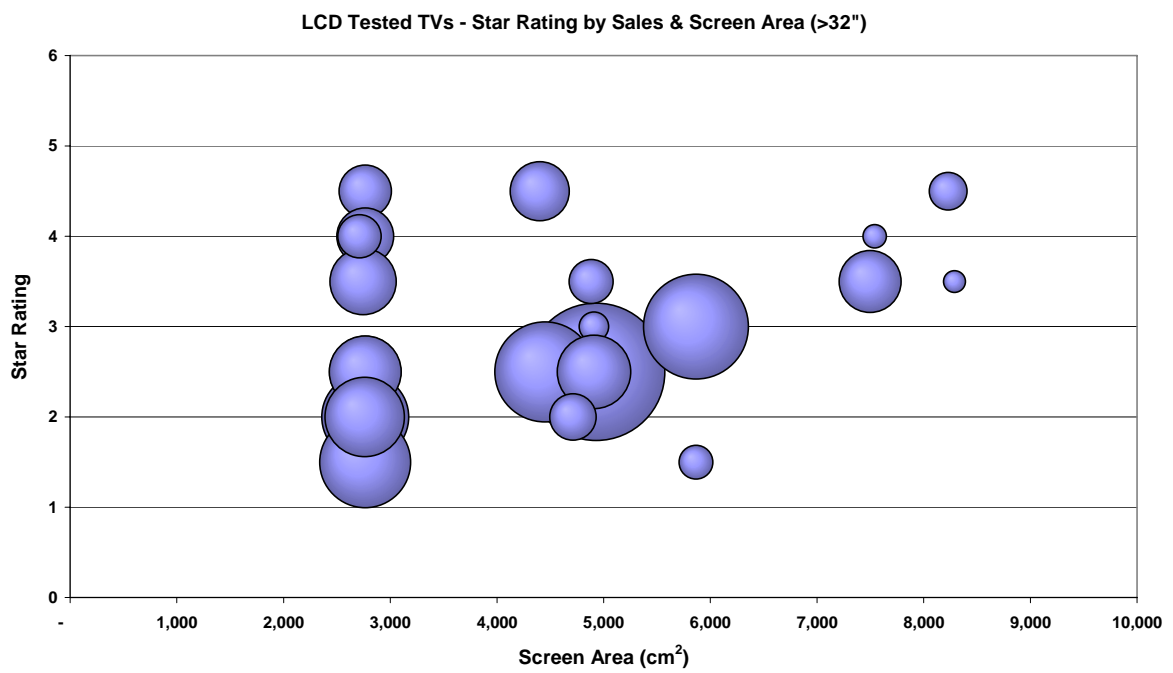
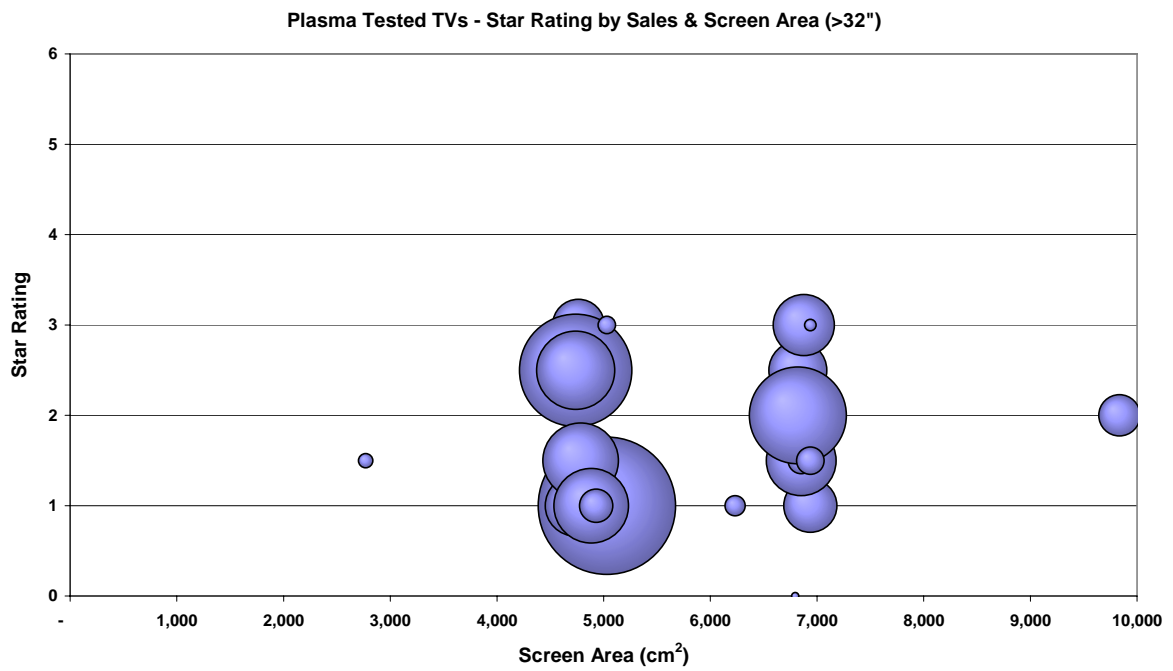
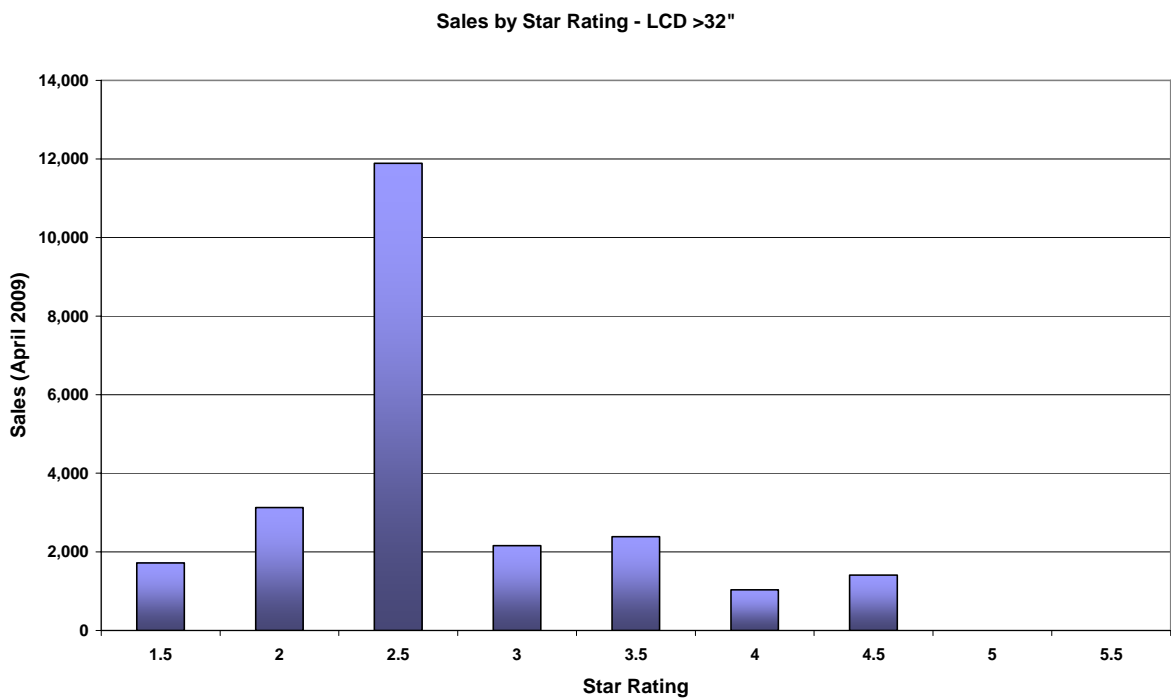
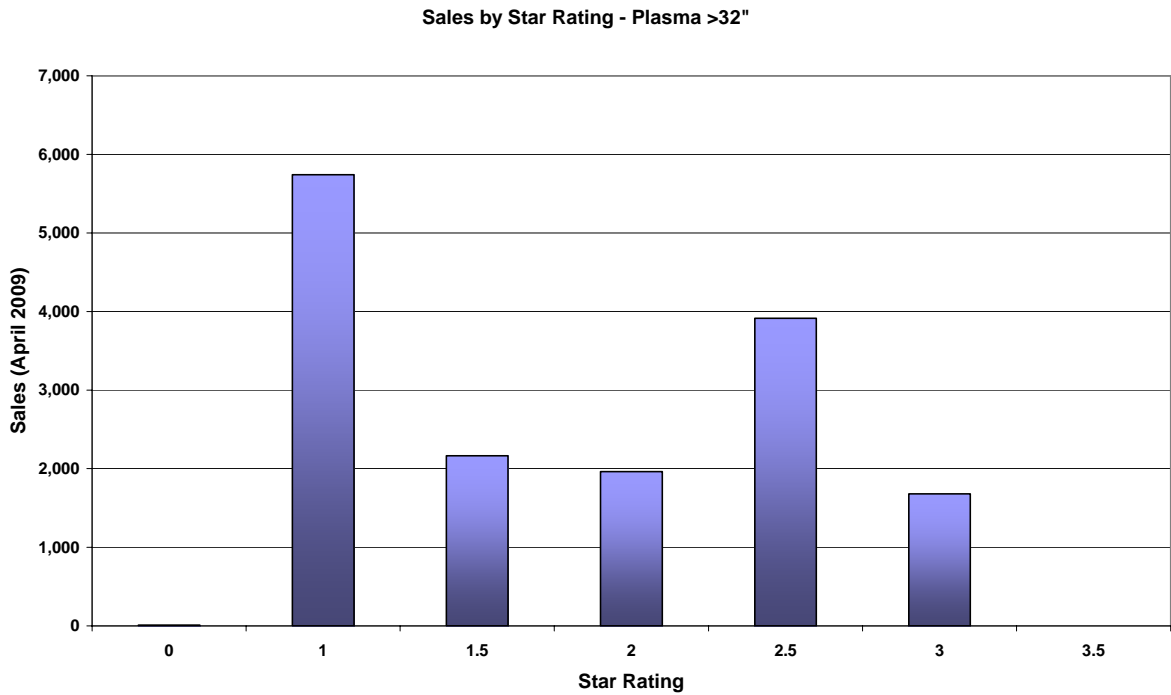


Figure 17 shows the frequency distribution of sales in April 2009 for the tested TVs by screen type and Star Rating. The majority of sales of tested Plasma TVs were 1 Star while the vast majority of tested LCD TVs sold in April were 2.5 Stars.

Figure 17: Sales (April 09) by Star Rating and Screen Type – Tested TVs >32” Screen Area



Summary and Conclusions

This baseline power consumption study examines the results of over 80 Plasma and LCD TVs tested under the new AS/NZS 62087.1(Int). It provides a snapshot of the power consumption, Energy Labelling characteristics and sales (where available) of TVs during the introduction of the Voluntary Energy Labelling program and before the introduction of Mandatory Energy Labelling and MEPS for TVs.

Summary

Overall, the analysis shows that:

- **Sales:** In April 2009 almost 150,000 TVs were sold in Australia, while total sales were estimated to be 2.4 Million in 2008.
- **Power consumption:** Plasma TVs range from 150 Watts to over 400 Watts with almost all Plasma TVs of screen size 42" or larger. For LCD TVs within the 42" and above screen size, power consumption ranges from 100 Watts to 275 Watts. The analysis of power consumption for Full-HD resolution TVs by screen type found that:
 - Full-HD Plasma TVs generally use more power than standard resolution Plasma TVs
 - Some Full-HD Plasma TVs consume less power than standard resolution Plasma TVs of comparable screen size
 - Almost all LCD screens of greater than 42" are now Full-HD resolution, however power consumption varies over 175% from the lowest to the higher power consumption.
- **Star Rating:** The average Star Rating for LCD TVs without labels was 2.6 stars, while those labelled averaged 3.7 stars. The average Star Rating for Plasma TVs without labels was 1.6 stars, while those with labels average 2.4 stars. When examined over time,
 - There has been a general increase in available models with higher star ratings released from 2008 to 2009
 - All TVs except one meet the proposed MEPS Tier 1 level of 1 Star.
- **Annual Energy Consumption:** There is a wide variation of Annual Energy Consumption of TVs by type and screen area, with the best available TV using about half the least efficient TV in most screen sizes.
- **Comparison with 2007 Tests:** Power consumption of TVs has reduced by 25% to 33% compared to previous tests from 2007.

- **Price:** The analysis of price and power consumption tends to support the findings from the RIS that no relationship exists between the price of the TV and the power consumption.
- **Sales:** Tested TVs represented approximately 40% of the all TVs above 32” screen size sold in Australia during April 2009. The majority of sales of tested Plasma TVs were 1 Star, while the vast majority of tested LCD TVs sold in April were 2.5 Stars.

Conclusions

Sales data shows that large numbers of TVs are being sold in Australia, with 2.4 million sold in 2008. Sales during April 2009 indicate that sales numbers are still high, even with lower economic growth and the impact of uncertain financial conditions.

Tests show a wide range of power consumption, hence Star Ratings, present in the market. LCD TVs range from 1.5 Stars to 5.5 Stars and Plasma TVs from 0 Stars to 3.5 Stars for the models sampled for testing.

The study clearly shows that models that were labelled under the Voluntary Energy Labelling program were more efficient than models that were not labelled. This suggests that manufacturers who voluntarily chose to participate in the program were doing so as they generally have more efficient models on the market.

This reaction to the Voluntary Energy Labelling program was not unexpected as suppliers, who have more efficient TVs were able to use the labelling program to their competitive advantage. After the mandatory program is introduced, consumers will have more comprehensive information and be able to use the label to more effectively to compare energy efficiency between models.

Although this study does not make any conclusions on the MEPS levels chosen for Australia, information on the availability of TVs by Star Rating can be assessed. The tests show that all TVs except one meet the proposed MEPS Tier 1 level of 1 Star. The data also shows that models released into the market in 2009 are more efficient than those released in earlier years. This trend provides early indications of the potential impact the Energy Labelling and MEPS for TVs. If this trend continues over the next year, we could expect the majority of TVs to achieve 3 Stars or more in 2010.

The study has found no relationship between the energy efficiency of TVs and price. However, when examining the range of price for TVs and energy efficiency over time, it appears that TVs are becoming more energy efficient over time with decreasing costs. We also found that Full-HD Plasma TVs are now available with a similar power consumption and price to similar sized Full-HD LCD TVs.

There exists a large range of efficiency (and star ratings) of TVs actually sold in April 2009, as determined by matching the test results of TVs selected for this study with sales data. However, from the sample tested, the majority of Plasma TV sales in April 2009 were found to be 1 Star, while the vast majority of LCD TVs sold were 2.5 Stars

References

- E3 2008a, *Voluntary Labelling Program for Televisions: Rules for Participation Ver 1.2*, prepared by Digital CEnergy Australia, for the Equipment Energy Efficiency Committee under the auspices of the Ministerial Council on Energy, July 2008, (revised June 2009).
- E3 2008b, *Consultation Regulatory Impact Statement: Proposed Minimum Energy Performance Standards and Labelling for Televisions*, prepared by Digital CEnergy Australia, for the Equipment Energy Efficiency Committee under the auspices of the Ministerial Council on Energy, Report 2009/03, February 2009.
- GfK 2009, *Sales data privately purchased for 2008 and April 2009*. May 2009. GfK Retail and Technology, Australia, unpublished.

Appendix 1: Details of All TVs Tested (not Published)