

APP Alignment of National Standby Power Approaches Project: Early Data Outcomes

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

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Introduction

Background

The Alignment of National Standby Power Approaches Project is being driven by the Australian Government's Department of Environment, Water, Heritage, and the Arts with assistance from Korea, as part of the Asia Pacific Partnership on Clean Development and Climate Change (APP). The APP members include Australia, Canada, China, India, Japan, Republic of Korea, and the United States of America. The purpose of this union is "to address the challenges of climate change, energy security and air pollution in a way that encourages economic development and reduces poverty". The standby project is one of several being undertaken by the APP's Building and Appliances Taskforce (BATF).

Standby power consumption, which is the power used by appliances when they are not performing their primary function, has been recognised as one of the most cost effective potential end-use energy efficiency measures. While the amount of standby power varies markedly between countries, the global energy consumption from standby has been estimated by the International Energy Agency (IEA) at between 200 TWh and 400 TWh per year.

The Basket of Products survey is the key component of the Alignment of National Standby Power Approaches Project and has been designed to enable consistent collection of data on standby power, resulting in a representative set of standby measurements. The data will be gathered for a common set of products in different regions and countries around the world. Such a comprehensive set of data will facilitate international comparisons, allowing trends in standby consumption, by products and/or by countries, to be tracked over time. The benefit of such a high quality data set is to enable benchmarking for success and to provide a sound basis for policy development and analysis.

The international survey method uses the principles set out in the test procedure IEC62301 and is based on the experience Australia has gained by conducting in-store surveys in the Australian marketplace since 2001. The Australian surveys target new appliances being offered for sale in selected major retailers (measured in situ) and complement related surveys of individual homes measuring all electronic products. This information has been extremely valuable because it provides trend data in standby power for new products. The database of over 7,000 measurements has enabled policy makers to very quickly establish which appliance types have increasing or decreasing standby trends.

Purpose of Report

This report provides an update on progress to-date and early results of the multi-country survey of standby power consumption. As some of the countries are still collecting

additional data to include in the data set, these early result are entirely indicative. In some cases the result show sample sizes of less than 5 products, which is too low to use for comparison purposes. However, to provide an indication of the type of analysis and reporting that is possible, these results are currently included. Therefore the results should be qualified as indicative if they are cited or used in other studies.

Progress to Date

At the beginning of 2007 a discussion paper “Basket of Products” was released identifying 14 core products and 29 secondary products. These products were seen to be relatively common in most markets and readily available in retail outlets, making them easily measured in any country around the world. The core products form the basis of the survey with all participating countries aiming to measure appliances in this group. In those countries where resources allow products in the secondary basket and/or other products of interest can be tracked using the same methodology. Table 1 below lists the 14 core products while the complete list of products measured can be found in Appendix A.

Table 1: Basket of Core Products

Appliance Name	
1	Clothes washers
2	Microwaves
3	Televisions – CRT
4	Televisions – LCD
5	Televisions – Plasma
6	DVD players
7	Integrated stereos,
8	Portable stereos
9	Computer monitors – CRT
10	Computer monitors - LCD
11	Computer Printers Laser
12	Computer Printers Inkjet
13	Multi-Function Devices (MFD's)
14	External Power Supplies

Following on from the identification of the core products a data collection tool was developed that included an Excel recording spreadsheet and detailed instructions. The tool has been designed in a user friendly format with multiple drop down lists in order to minimise data entry error while still allowing flexibility for unique situations that may apply in a particular country or a distinctive model.

The data collection tools and instructions were trialled in New Zealand in October 2007. This consisted of conducting a survey of over 300 products, visiting 5 retail outlets and giving 4 EECA staff exposure to the process. As a result, modifications to the tools and instructions were completed. The survey instrument and instructions were then distributed to the participating APP partners.

Training workshops providing participants with detailed instruction on the testing procedure as well as practical experience in testing products were conducted in Korea, India and Japan in November 2007 and January 2008. Additionally, partners in Korea

and India conducted store surveys as part of the training allowing participants to gain first hand experience of the process. Support has also been provided by email and phone to the APP partners in Korea, India, Japan and the USA.

In order to support the project and share information a website has been developed. The website is currently in the testing stage but it is anticipated that it will go live shortly. The website contains graphs allowing comparisons by country and summary graphs looking at products over time and across modes. Users will be able to choose data by selecting desired country, product type, mode and year. Registered users will be able to download pooled data. It is anticipated that the comparison data will be updated on a 6 monthly basis.

The first round of data collection has now been completed in Australia, Canada, India, Korea, New Zealand and the United States. An outline of the successes of the program to date as well as the plan for future actions can be found in Table 2 below.

Table 2: Project Timetable

Item	Date	Notes
Send Survey Instrument to university partners	Sep 2007	Done
New Zealand (EECA) trial of data collection	Oct 2007	Done
Distribute survey instrument and instructions to APP partners	Oct 2007	Done
APP Teleconference	16 Oct 2007	Done
Web site for International Comparisons (Draft)	Nov 2007	Draft site developed
Country Participant data Collection	To Feb 2008	India, Korea, US, Australia & Canada
Other country data collection	To Feb 2008	NZ (Oct 2007), Czech Republic & Hungary (Mar 2008?)
Training and guidance to Country Participant Survey Teams to gather first round of data	To Feb 2008	India, Korea, Japan
Second APP Teleconference	Feb 2008	Done
Public report on APP initial data outcomes	March 2008	Underway
Web site for International Comparisons (Final)	March 2008	Trial available
APP standby project group meeting (AM) and training workshop (PM)	April 2008	1 April, New Delhi
IEA/BEE International Standby Conference	April 2008	2-3 April, New Delhi
Next round of data collection	April to August 08	

Interpreting the Results

Definition of Standby Modes

Appliances and equipment with a “standby mode” may include any product that consumes power while not performing its primary function. A simple definition of “standby” is when an appliance is at its lowest power consumption when connected to mains power, even if the appliance is turned off (lowest power mode that can be influenced by the user). However, “standby” is better defined under various modes and for the purpose of the international basket of products survey the following definitions were used:

Power – In Use (on): the power used by the product when performing its primary function.

Power – Active standby Active standby is when the appliance is on but not performing its main function. For example, the DVD may be on but is not playing or recording. This mode is usually only present in devices (a) where there is a mechanical function which is not active (e.g. DVD drive or motor) but where power circuits are on, or (b) where a device has a battery and the device is charging

Power – Passive standby When a product or appliance is not performing its main function (sleeping) but it is ready to be switched on (in most cases with a remote control) or is performing some secondary function (e.g. has a display or clock which is active in this mode). This mode also applies to power supplies for battery operated equipment (portable appliances which are intended to be used when disconnected from the base station) when the appliance is not being charged (disconnected).

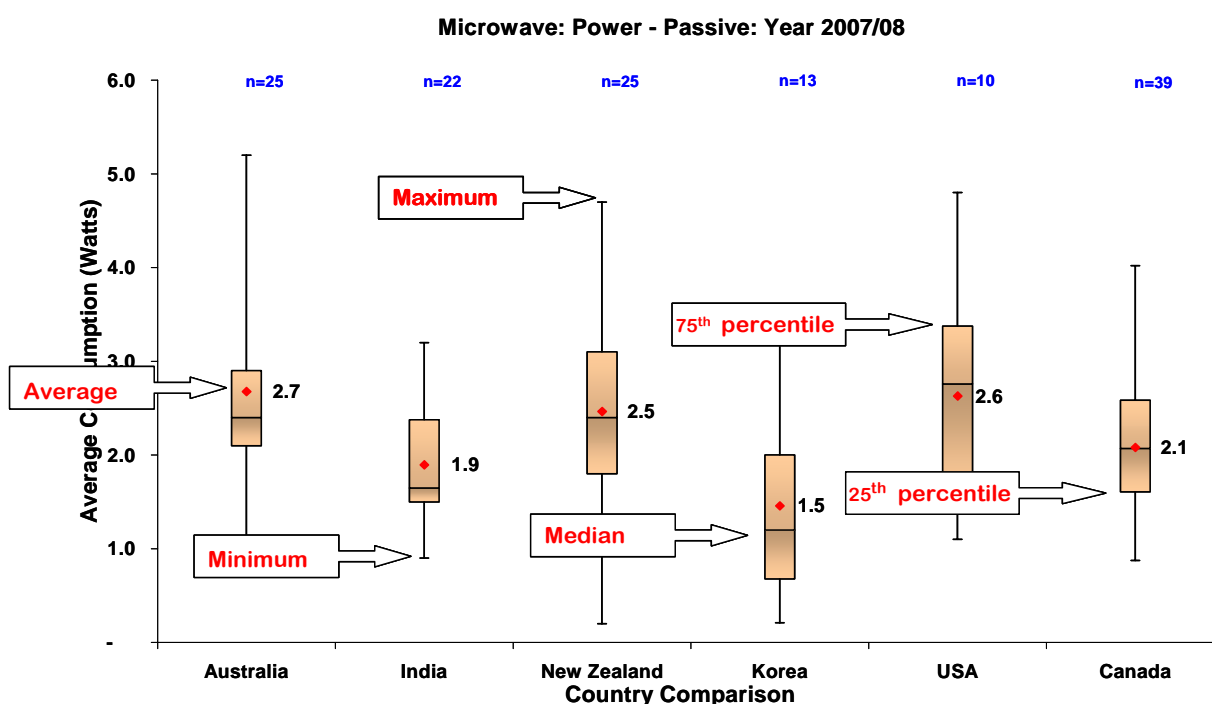
Power – Off The product must have a power switch located on the product. Off mode is when a product or appliance is connected to a power source but does not produce any sound or picture, transmit or receive information or is waiting to be switched “on” by the consumer. If the product has a remote control, it cannot be woken by the remote control from off mode – it can only be activated via the power switch on the product. No display should be active in off mode. While the product may be doing some internal functions in off mode (e.g. memory functions, EMC filters) these are not obvious to the user. An LED may be present to indicate off mode.

Box and Whisker Graphs

The international comparison data has been presented using the Box and Whisker graph format. This enables the maximum and minimum consumption data to be displayed along with the mean, the median and percentile data. The maximum and minimum power consumption recorded in each country is represented by the marks at the end of the vertical lines (the whiskers). The mean or average power consumption is marked on the chart with a red diamond and the actual figure written alongside. The median or middle data point is shown by a black line inside the brown box. Fifty percent of all readings fall

within the brown box with the upper edge being the 75th percentile and the lower edge representing the 25th percentile. Therefore the upper whisker represents the range of values in the highest 25% of readings and the bottom whisker represents the lowest 25%. Figure 1 below further illustrates how to interpret the data from these graphs.

Figure 1 Example Box and Whisker Graph



Qualification of Survey Results

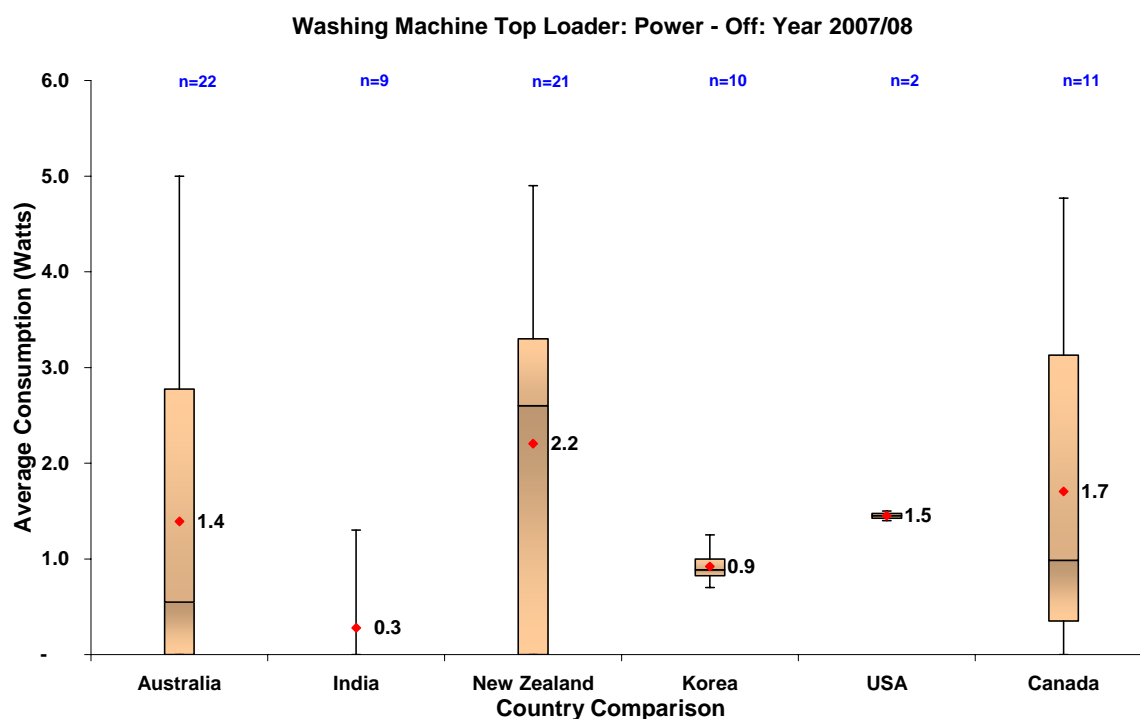
This document is reporting on the early data outcomes for the APP project. As with any new survey methodology being implemented by multiple users across many countries there may be some discrepancies in the data to do with measurement technique and understanding of the process. These irregularities usually become apparent after subsequent data collection and analysis. In addition not all data included brand and feature information making it difficult to assess why differences in consumption are occurring from one country to the next. The survey tool was not used by all countries for the first round of data collection. Slight differences in the categorisation of modes means the data has been slotted into best fit categories, which may result in small data errors.

International Product Data by Mode

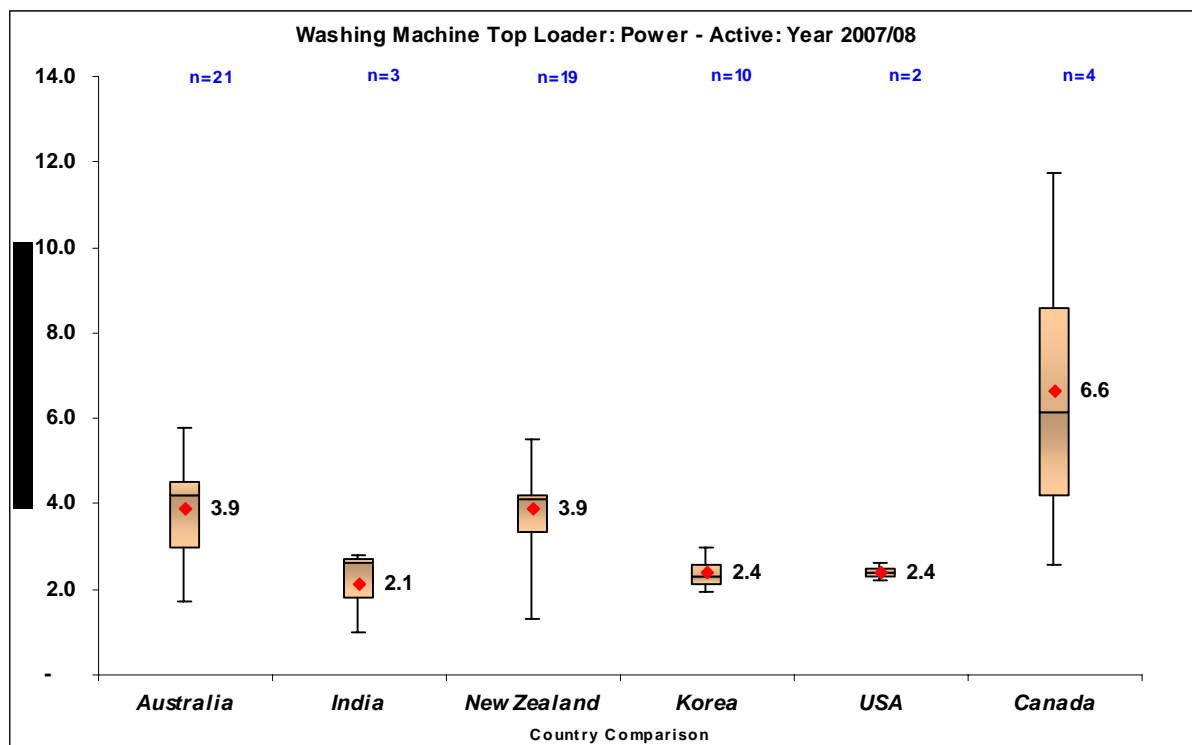
Clothes Washer – Top Loaders

Top loading washing machines have been measured in 6 countries to date. The off power results as shown in Figure 2 demonstrate that both Korea and India found the product average to be below one watt, and the range of consumption to be smaller than the other countries. The small Indian sample may be affected by the presence of two (40%) models with manual controls. The Korean data does not have features information for washing machines. The New Zealand data may also be biased with over 50% of the sampled units coming from one brand.

Figure 2 2007/08 International Comparison Washing Machine Top Loader Off Mode



In active standby mode top loading machines were averaging between 2 and 4 watts in all countries except Canada. At this stage the Canadian data needs to be considered very preliminary as the survey methodology used did not nominate washing machine type so Front loading machines may be included in this data. This may cause the average to be higher. The data for active mode is presented in Figure 3

Figure 3 2007/08 International Comparison Washing Machine Top Loader Active Mode

Clothes washers – Front Loaders

Front loading clothes washer data was collected in 5 countries, however as only one model was found in the Indian sample this data can not be used for comparison. Additionally the Korean data was only collected in active standby. Average Consumption in the other 3 countries was below one watt in off mode; however the range spanned from zero to a little over 4 watts. The data as shown in Figure 4 was consistent across the 3 countries.

The average active mode consumption for front loading clothes washers was more than double in Korea and the USA, compared to Australia and New Zealand. Additionally the range of results was much wider in both countries. All of the USA models had electronic controls and one brand made up 70% of the sample. These results are presented in Figure 5.

Figure 4 2007/08 International Comparison Washing Machine Front Loader Off Mode

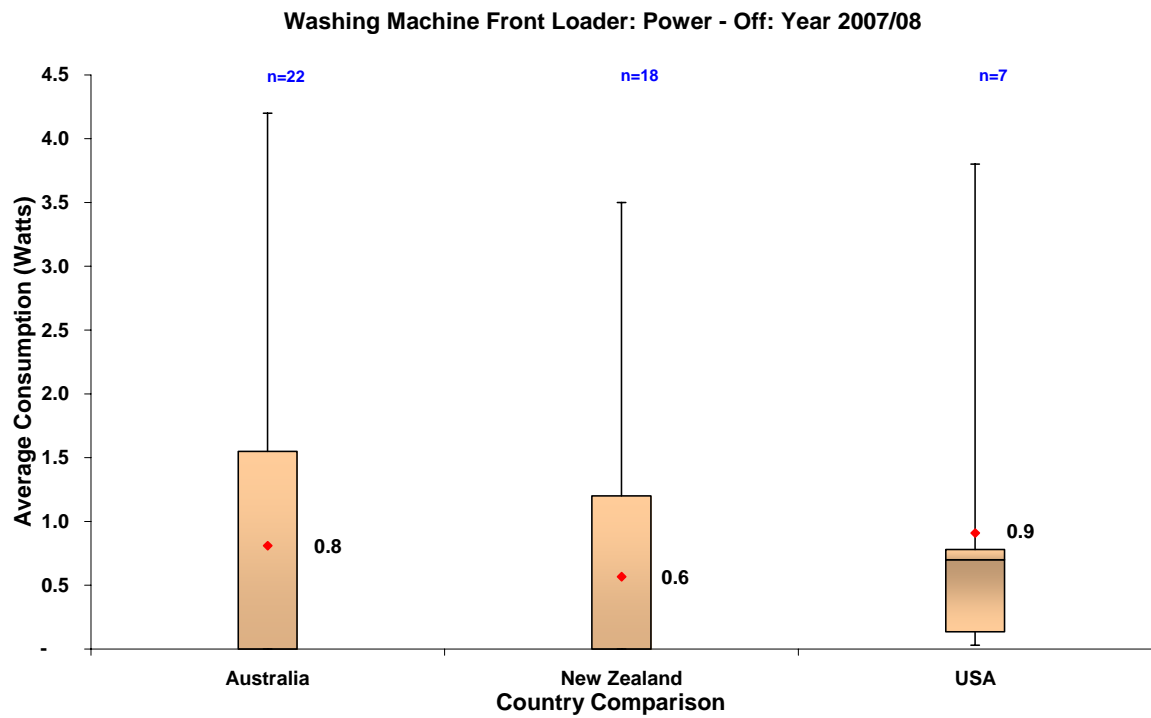
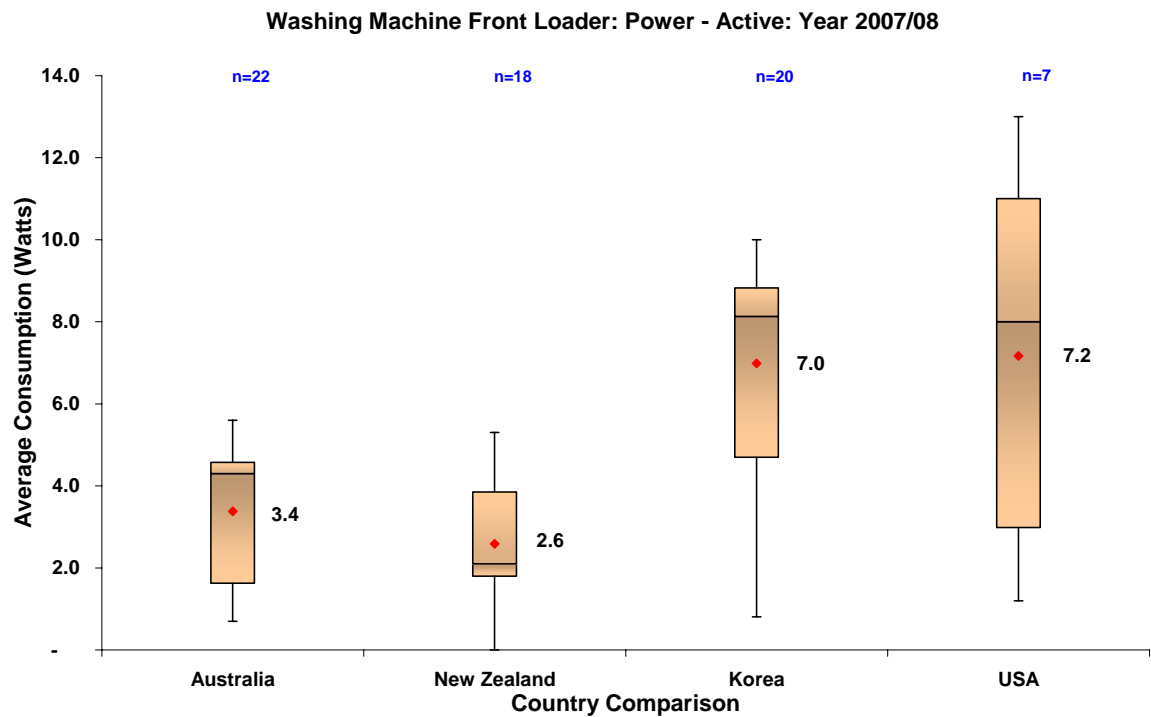


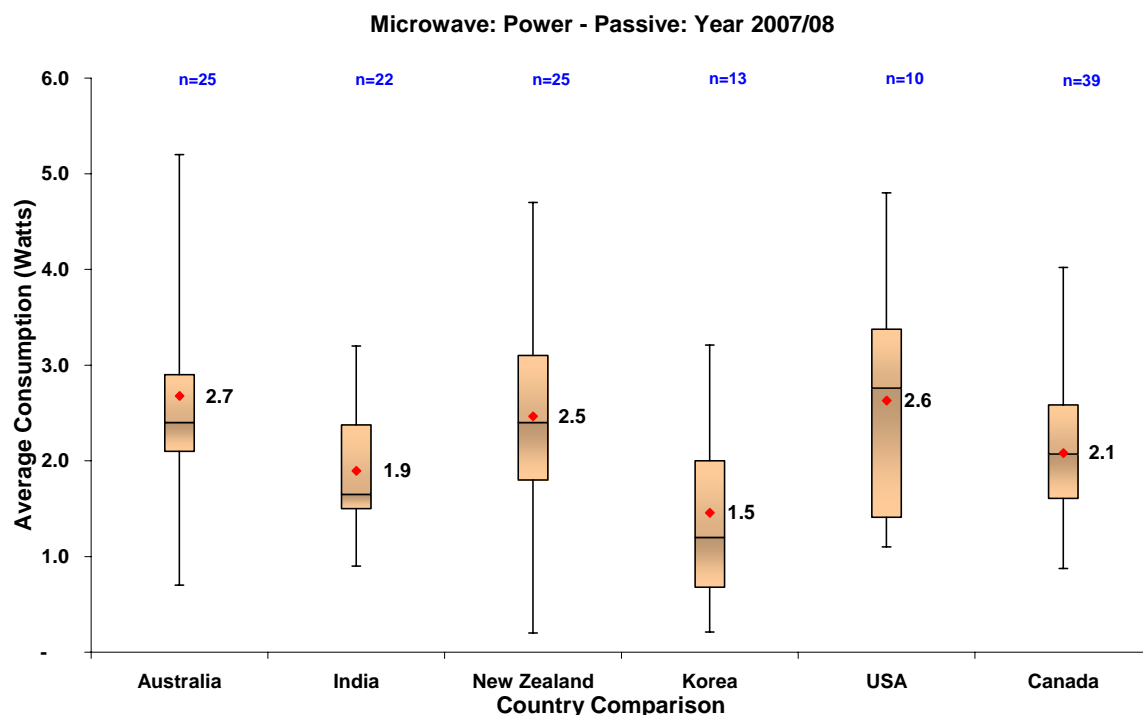
Figure 5 2007/08 International Comparison Washing Machine Front Loader Active Mode



Microwaves

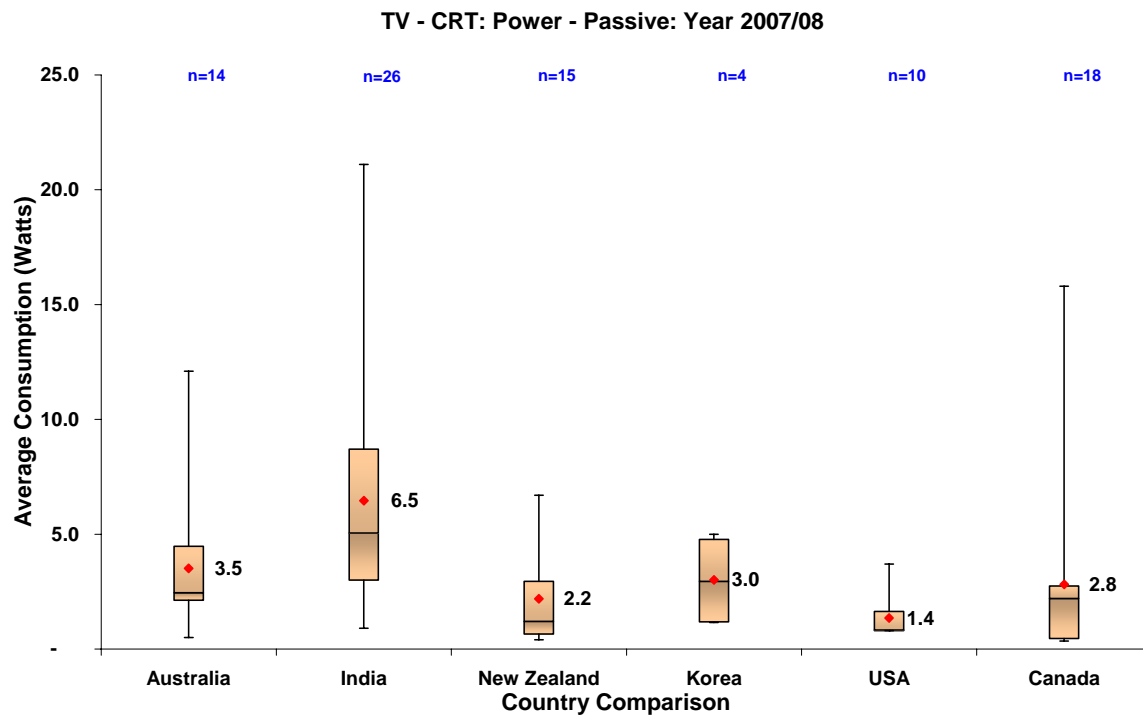
All six countries were able to collect data on Microwave ovens in passive standby. Both Korea and India found average consumption and the range of consumption to be lower. Data for the other four countries was similar; however as shown in Figure 6, Canada's average consumption was the lowest at 2.1 watts. There was a bias toward one brand (65%) in the Indian data; however over 19 brands were covered in total across the countries. There was no discernable difference among the reported features.

Figure 6 2007/08 International Comparison Microwaves Passive Mode



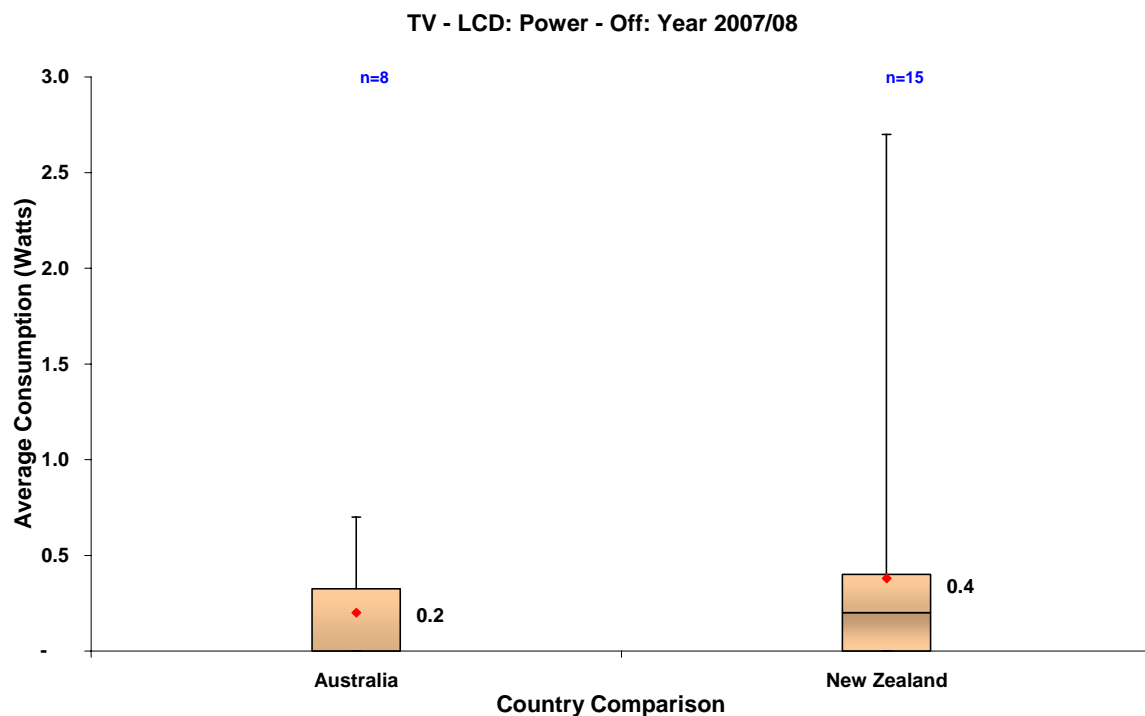
Televisions – CRT

CRT televisions were measured in all six countries however the Canadian Korean and USA samples did not include off mode data. CRT televisions generally have no consumption in off mode. As shown in Figure 7 all countries recorded passive standby for CRT televisions. With the exception of India passive standby consumption was fairly consistent across the countries. The Indian data may be influenced by the presence of built-in subwoofers in some models.

Figure 7 2007/08 International Comparison TV - CRT Passive Mode

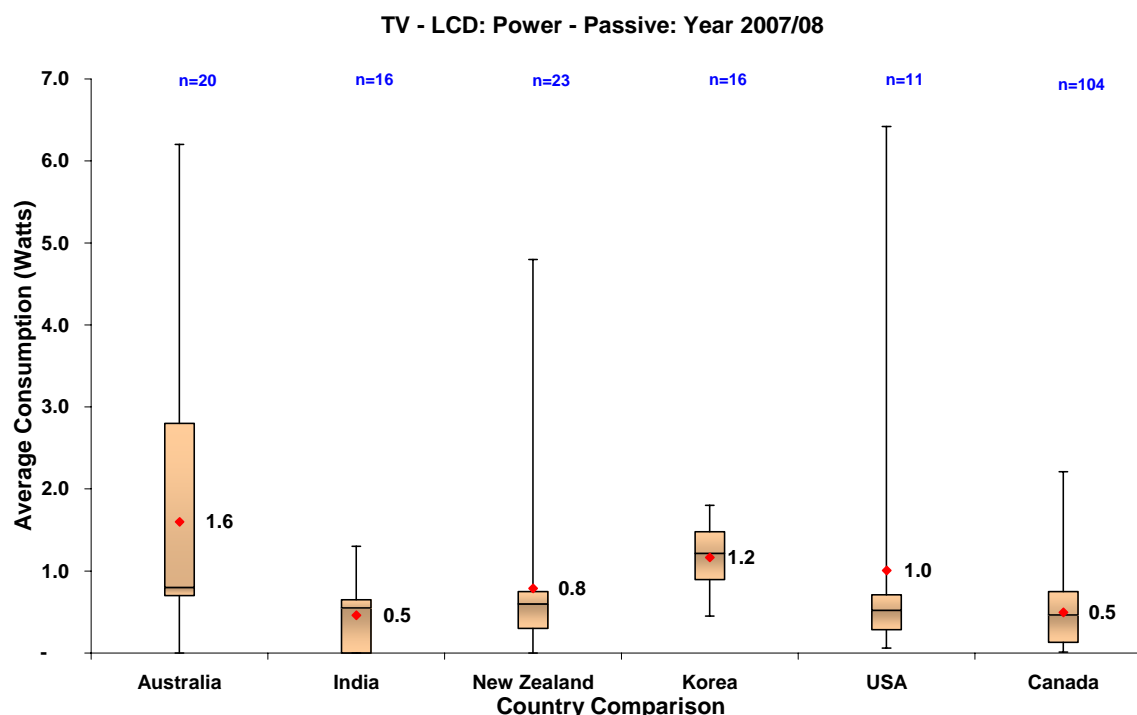
Televisions – LCD

An increasing number of LCD televisions are being manufactured without an off mode. As shown in Figure 8 only Australia and New Zealand recorded off mode, finding the average in both countries was below half a watt. The large range in the New Zealand data is caused by one model which recorded 2.7 watts in off mode. While New Zealand models were all analogue products the majority of the Australian data came from units with digital tuners.

Figure 8 2007/08 International Comparison TV - LCD Off Mode

As shown in Figure 9, LCD televisions measured in India and Canada recorded an average less than half a watt in passive standby mode, with the other countries hovering around the 1 watt range. While the Indian sample included models from 5 different brands 69% of units came from two manufacturers. It is also interesting to note that while the range of consumption in Australia is similar to New Zealand, average consumption is double.

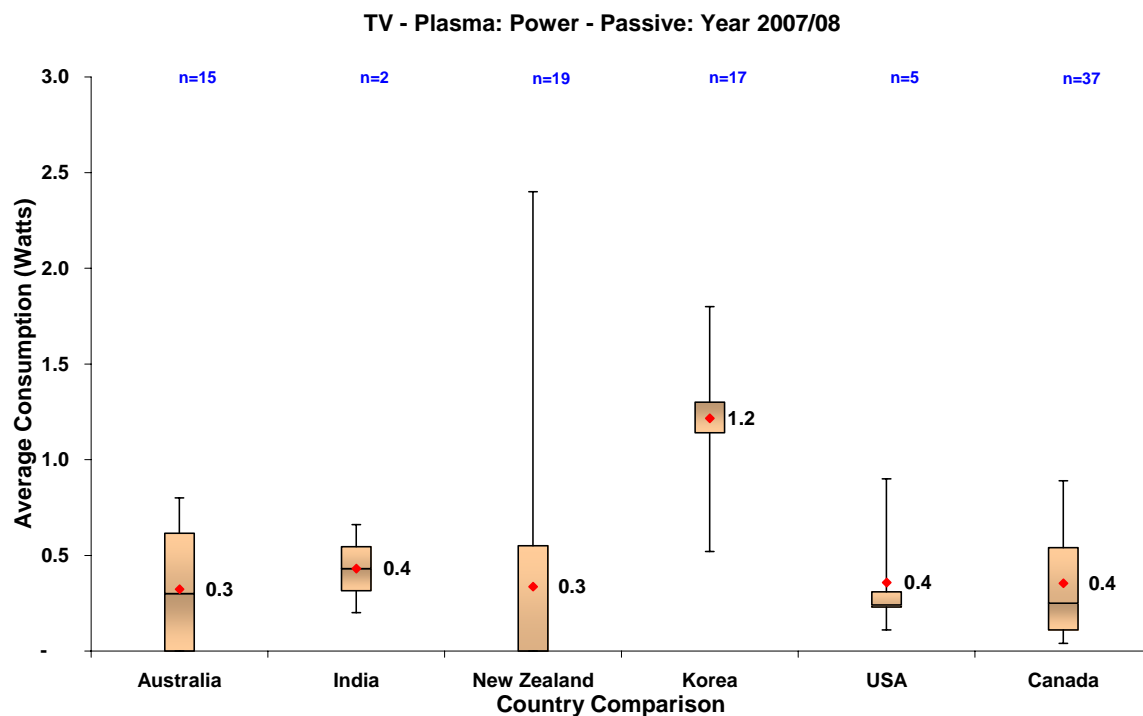
Note: The Canadian data has had four extreme readings removed from the data set. These readings ranged from twice as high to 9 times the next highest reading from any country and up to 24 times the next highest Canadian reading. It is unclear whether these measurements occurred in true passive standby or if the units were performing some function, e.g. electronic programming. Average passive standby for the Canadian results was comparable with that of the other countries even when this data was included.

Figure 9 2007/08 International Comparison TV - LCD Passive Mode

Televisions – plasma

In plasma televisions, the presence of an off mode also appears to be declining. Those models with an off mode recorded no consumption in this state. Passive standby was comparable across all countries with only Korea recording an average above 1 watt. There is no feature or brand data available to examine if there is a particular reason for this. The results are presented in Figure 10.

Note: Four Canadian, Five Australian and one USA data extreme reading has been removed from the data set. These readings ranged from 8 times higher to 15 times the next highest reading from any country. It is unclear whether these measurements occurred in true passive standby or if the units were performing some function, e.g. electronic programming. All of the units had digital tuners. The removal of these data points drastically reduced the average passive standby for these countries from 2.8 watts, 4.6 watts and 3.8 watts.

Figure 10 2007/08 International Comparison TV - Plasma Passive Mode

DVD players

Figure 11 and Figure 12 show passive and active standby mode for DVD players. In both modes there are wide variations in average consumption across countries, even though all the surveys have a variety of brands represented and there appears to be no particular feature differences. Low passive standby does not guarantee low active standby with Australia having the second lowest average passive consumption and the highest average active standby consumption. The three highest consuming models in each country all came from different brands. Few models were found to have an off mode with the overwhelming majority of these having zero consumption. The USA recorded more models with off mode than passive standby however this may be a result some teething issues with data collection techniques.

Figure 11 2007/08 International Comparison DVD Passive Mode

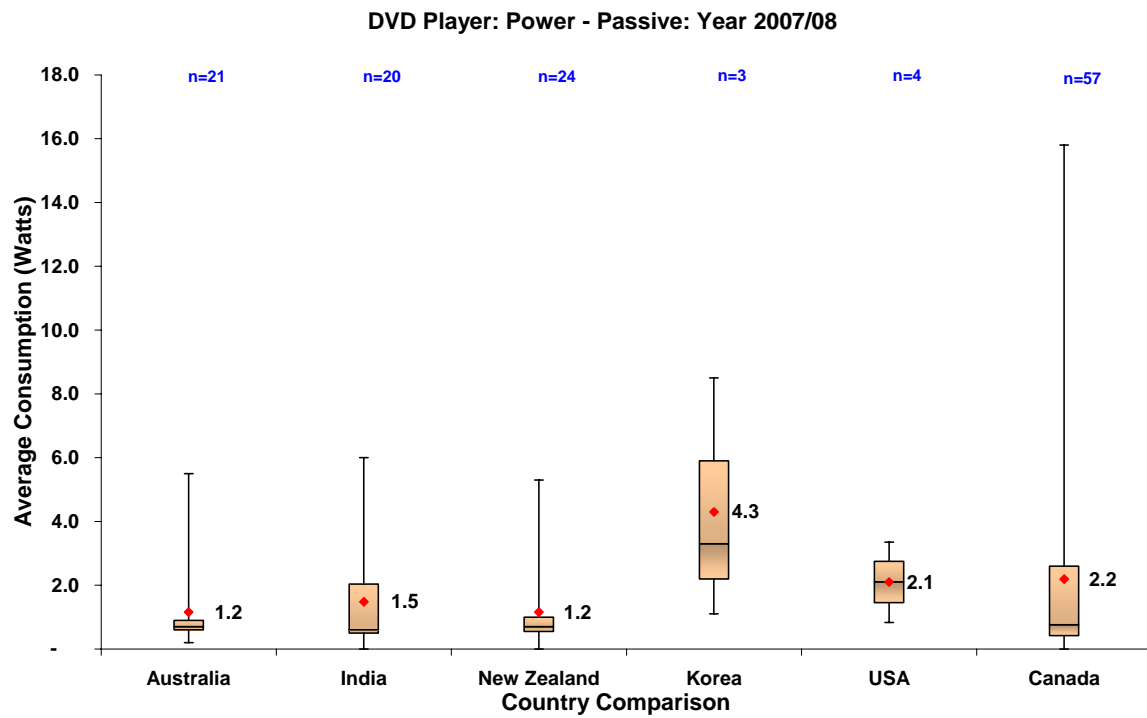
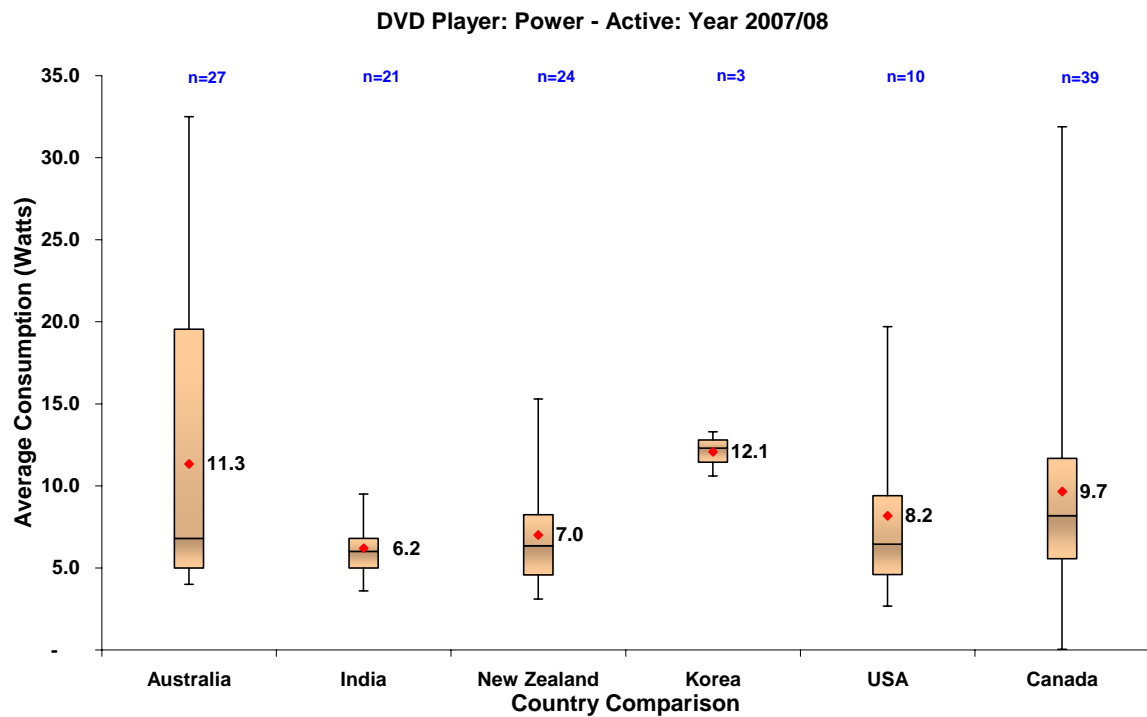


Figure 12 2007/08 International Comparison DVD Active Mode



Integrated Stereos

Integrated stereo data was collected for a variety of brands in all six countries. The passive and active standby results varied, with Australia and New Zealand having the lowest average passive standby and Korea and Australia having the lowest average active standby. No obvious differences in brands or features could be identified to explain these variations. Figure 13 and Figure 14 present this data.

Figure 13 2007/08 International Comparison Stereo - Integrated Passive Mode

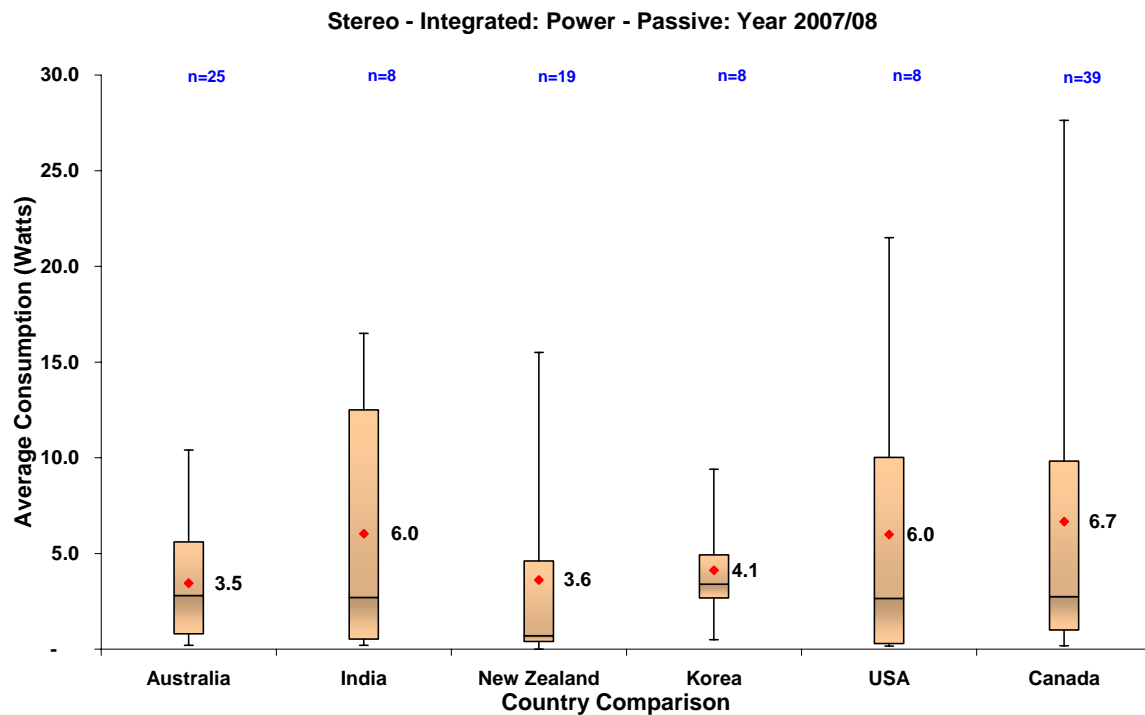
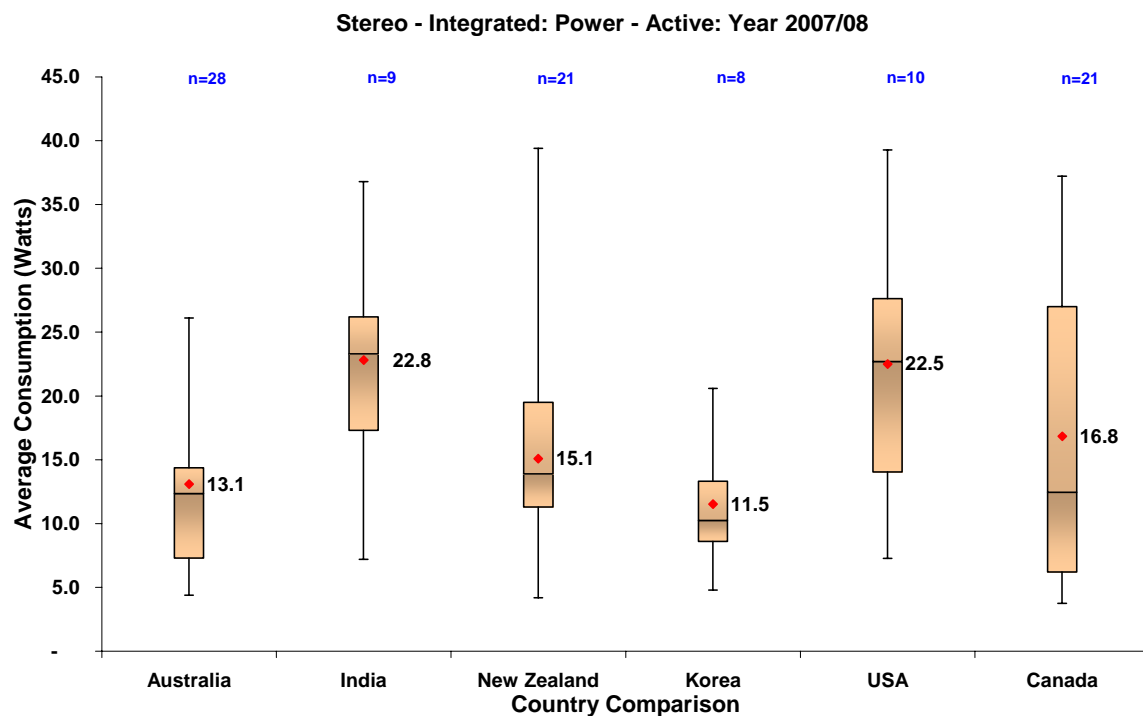


Figure 14 2007/08 International Comparison Stereo - Integrated Passive Mode

Portable Stereos

The data collected by all countries for portable stereos is remarkably similar with the exception of Australia. In all 3 modes Australian appliances presented both a bigger range of results and a higher average standby, this may be due to the sample having the widest range of brands. One brand dominated the samples from India (100%), New Zealand (57%) and the USA (50%). Figure 15, Figure 16 and Figure 17 present the consumption results for each of the modes.

Note: The USA recorded no data for passive standby

Figure 15 2007/08 International Comparison Stereo - Portable Off Mode

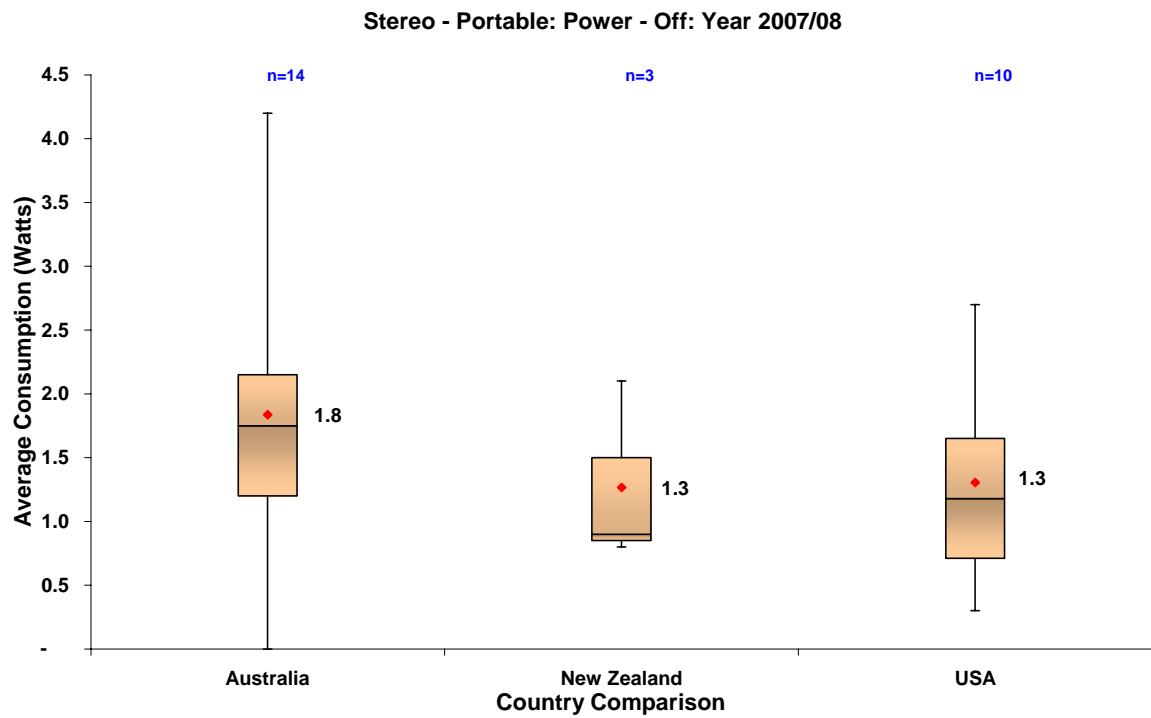


Figure 16 2007/08 International Comparison Stereo - Portable Passive Mode

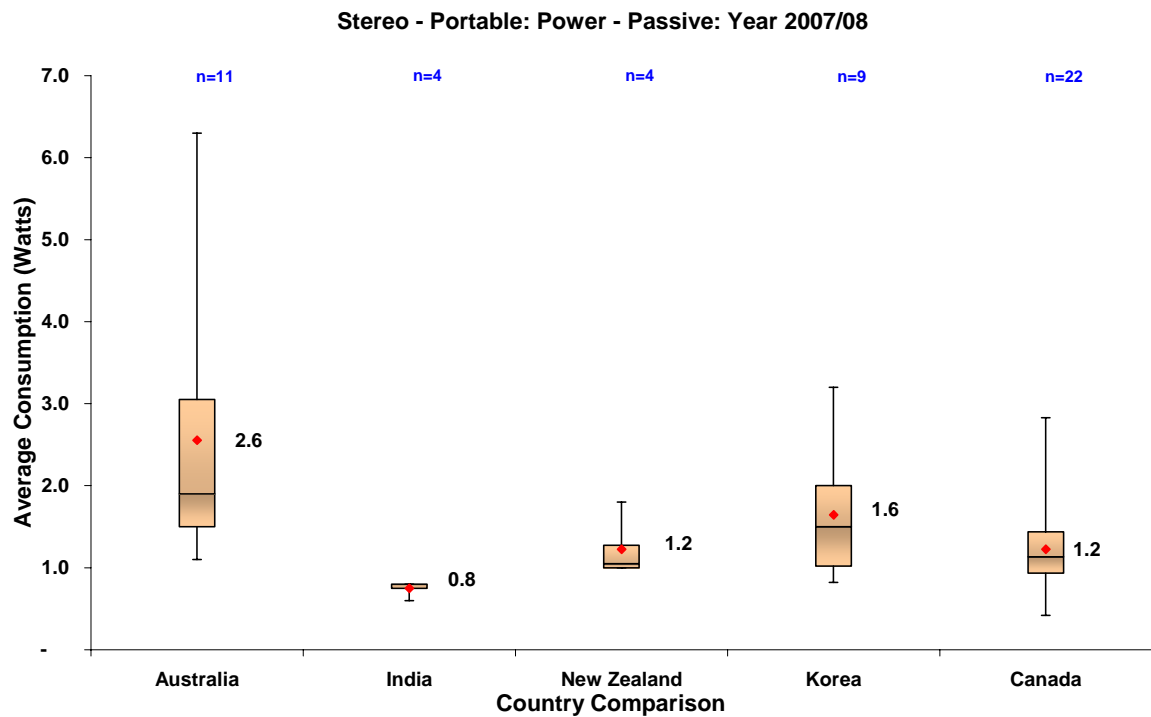
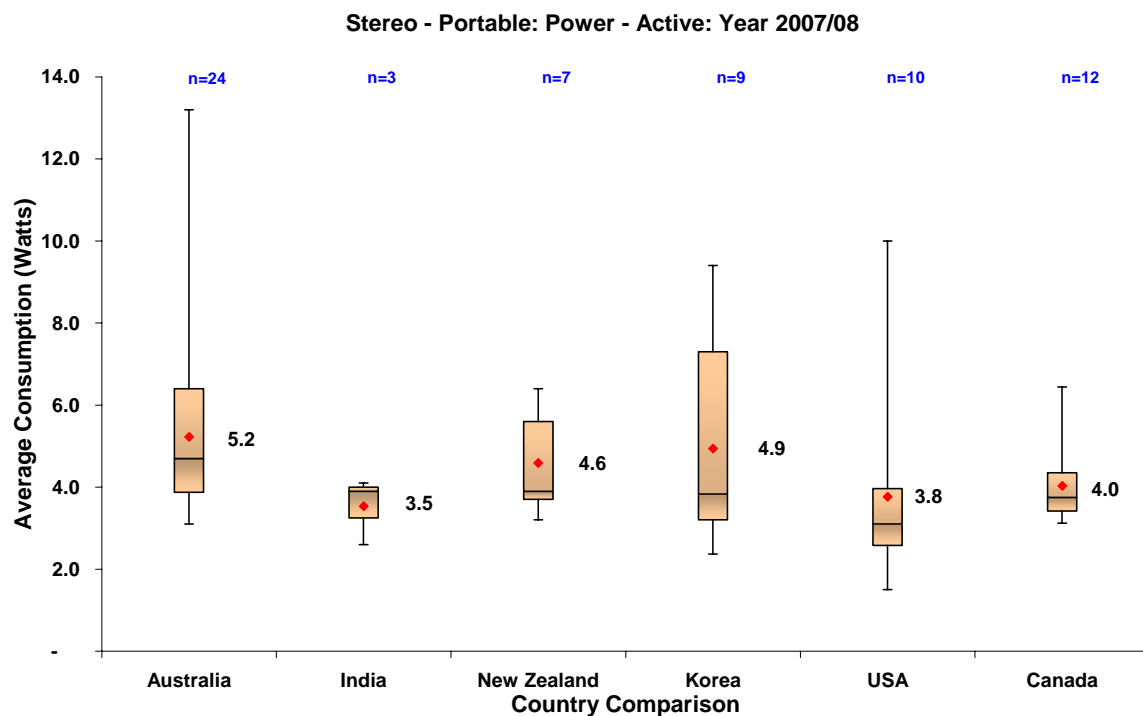
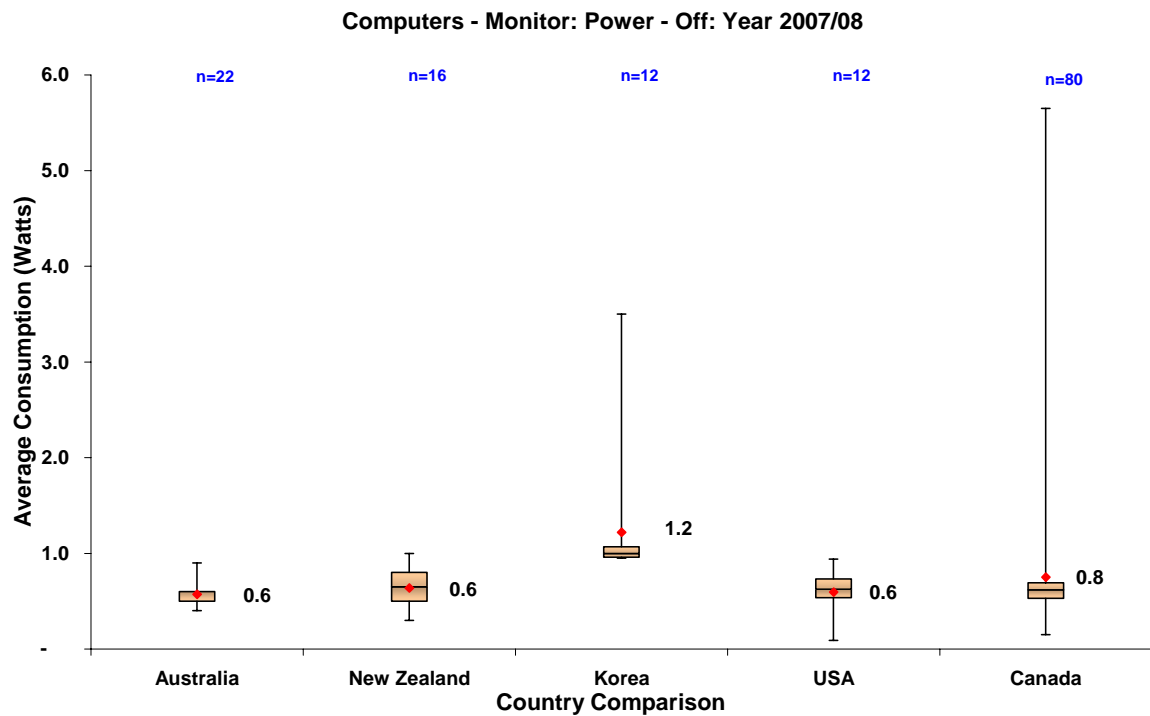


Figure 17 2007/08 International Comparison Stereo - Portable Active Mode

Computer Monitors

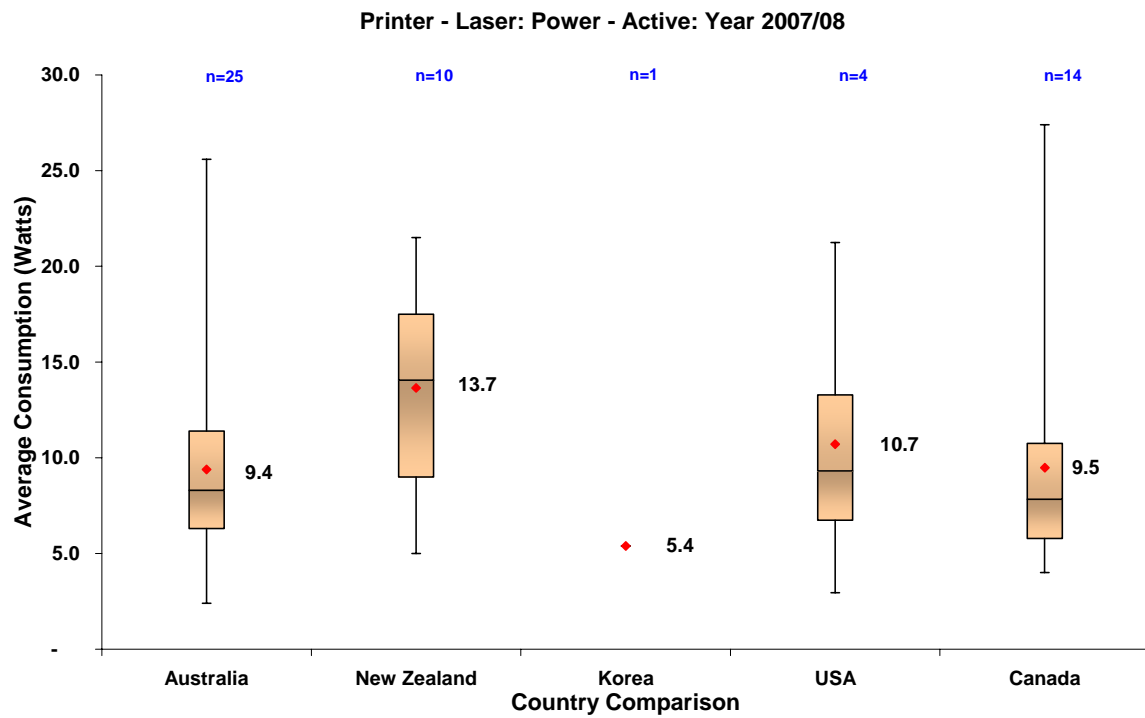
Computer monitor data was collected in five countries. As shown in Figure 18 results for most countries were similar, with average standby falling below 1 watt. The exception to this was Korea, which had an average off mode of 1.2 watts and a low range higher than all other countries. There is no obvious difference with a variety of brands and sizes covered in all surveys and feature data consistent across countries. Also worth noting is the wide range of consumption found in the Canadian study which had a very large sample size of 80 models.

Figure 18 2007/08 International Comparison Computer Monitor Off Mode

Printers – Laser

Laser printers across all countries by and large consumed no power in off mode. Consumption in active standby was measured in 5 countries and as shown in Figure 19 the range of consumption was similar for all. Discounting the Korean data which only sampled 1 model, average active consumption ranged from 9.4 watts to 13.4 watts. The New Zealand study resulted in a higher standby due to the predominance of colour printers (80%) in the sample. Colour printers in all countries averaged higher consumption than black and white. There was an even distribution of colour compared with black and white in the other samples.

Figure 19 2007/08 International Comparison Laser Printer Active Mode



Printers – Inkjet

Four countries collected data on inkjet printers, however as the Korean sample is less than 5 models it is not feasible to use this data in comparative analysis. Figure 20 and Figure 21 demonstrate that the off and active standby mode data was similar across all three samples with little difference in either range or average consumption.

Figure 20 2007/08 International Comparison Inkjet Printer Off Mode

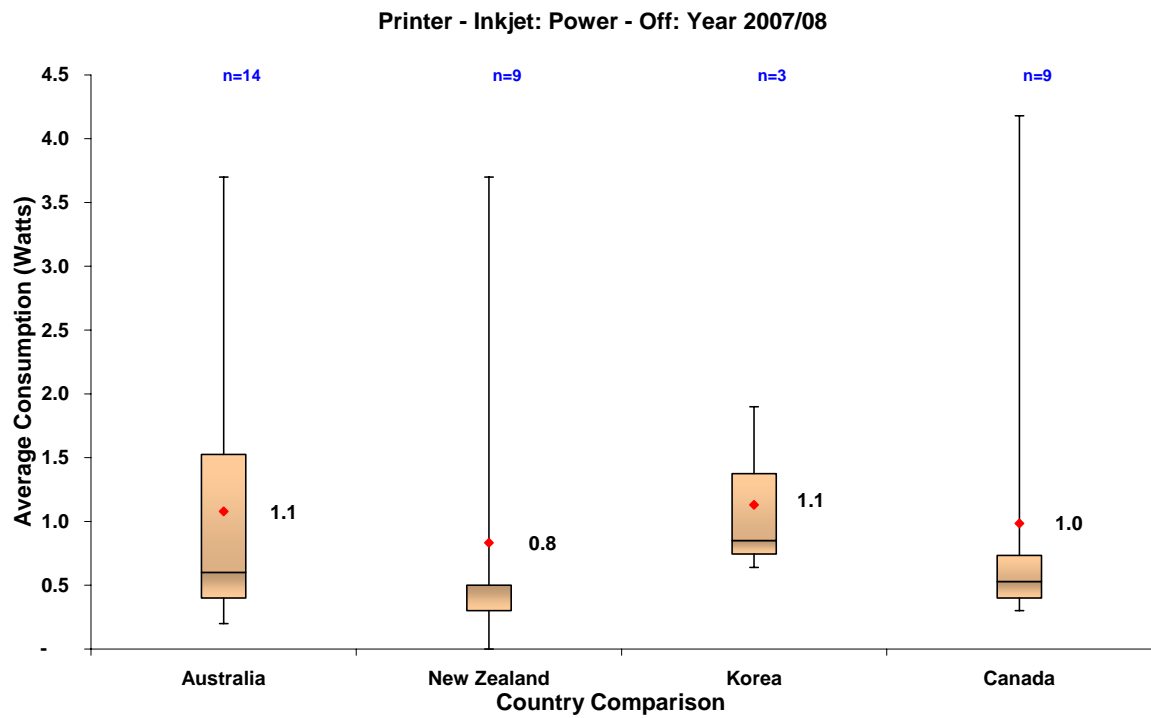
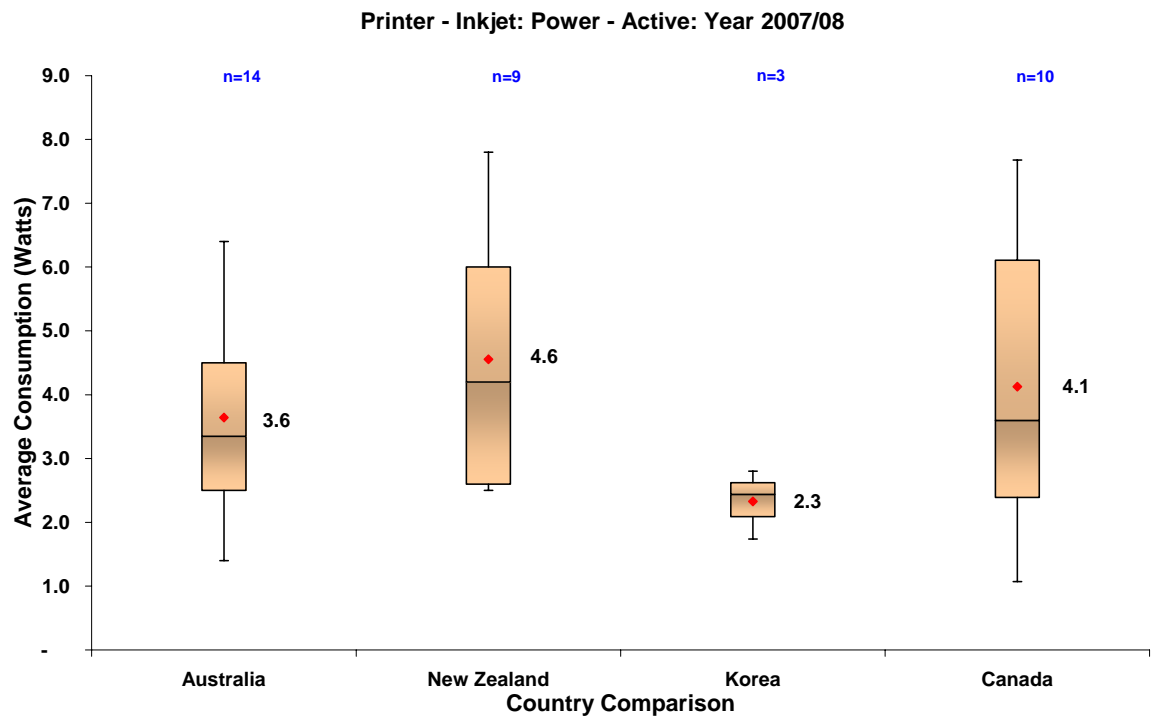


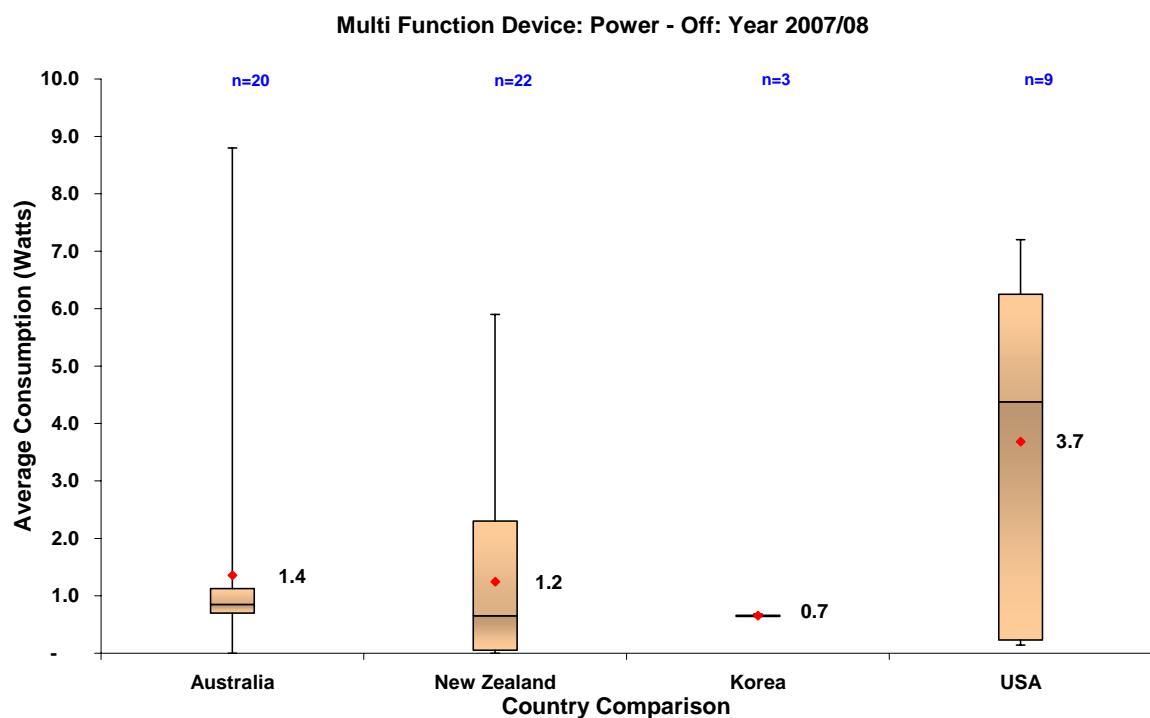
Figure 21 2007/08 International Comparison Inkjet Printer Active Mode



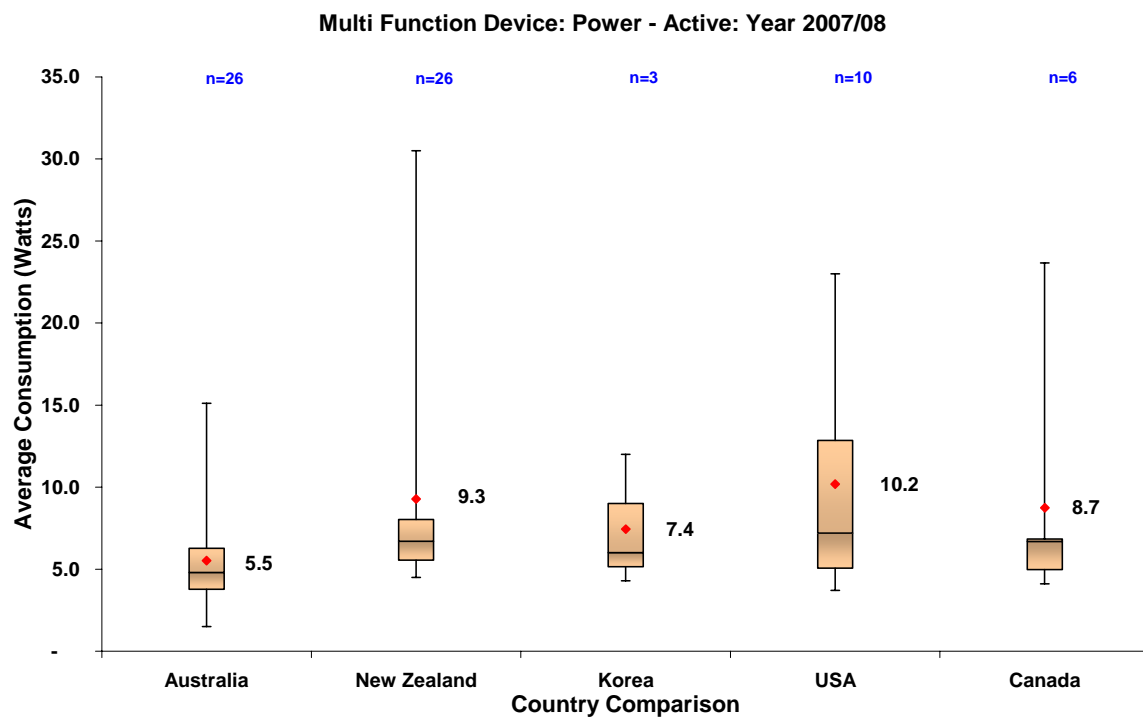
Multi-Function Devices (MFD's)

Figure 22 presents off mode data for multi function devices. While the range of consumption was consistent across all countries the USA had a much higher average at 3.7 watts. The USA sample was dominated by one brand (60%) which consistently tested at the higher end of the spectrum.

Figure 22 2007/08 International Comparison Multi Function Device Off Mode



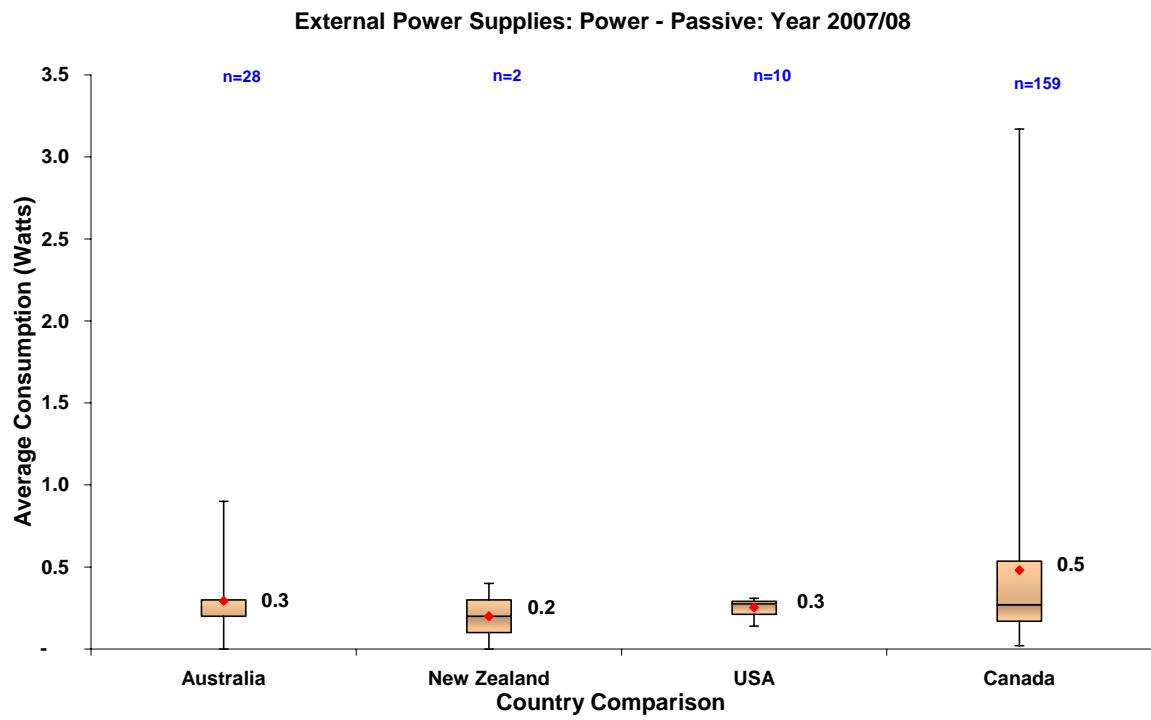
Active standby consumption for multi function devices is shown in Figure 23. This chart presents Australian data at much lower active standby levels than the other countries. Interestingly this lower active standby level is likely to be a result of no laser printer models being present in the Australian 2007/08 sample. Looking back at the Australian data from the 4 previous years it is consistent with the results of the other countries. It should be noted however that the low point of the Australian data is much lower than the other ranges.

Figure 23 2007/08 International Comparison Multi Function Device Active Mode

External Power Supplies

The results for passive standby consumption of external power supplies were remarkably consistent across all countries. The average consumption was less than half a watt for all four countries that collected data. As shown in Figure 24 the Canadian data was spread over a wide range due to large sample size, however the average consumption was still in line with the data from the other countries.

Figure 24 2007/08 International Comparison External Power Supplies Passive Mode



Product Trends in Australia

Clothes washers – Top Loaders

Average consumption for top loading washing machines in Australia has been stable for the last five years with no significant increase in off or active mode consumption during this time. These results are presented in Figure 25 and Figure 26. No washing machines were surveyed in 2006/07 year.

Figure 25 Australian Time Series Data – Washing Machine Top Loader Off Mode

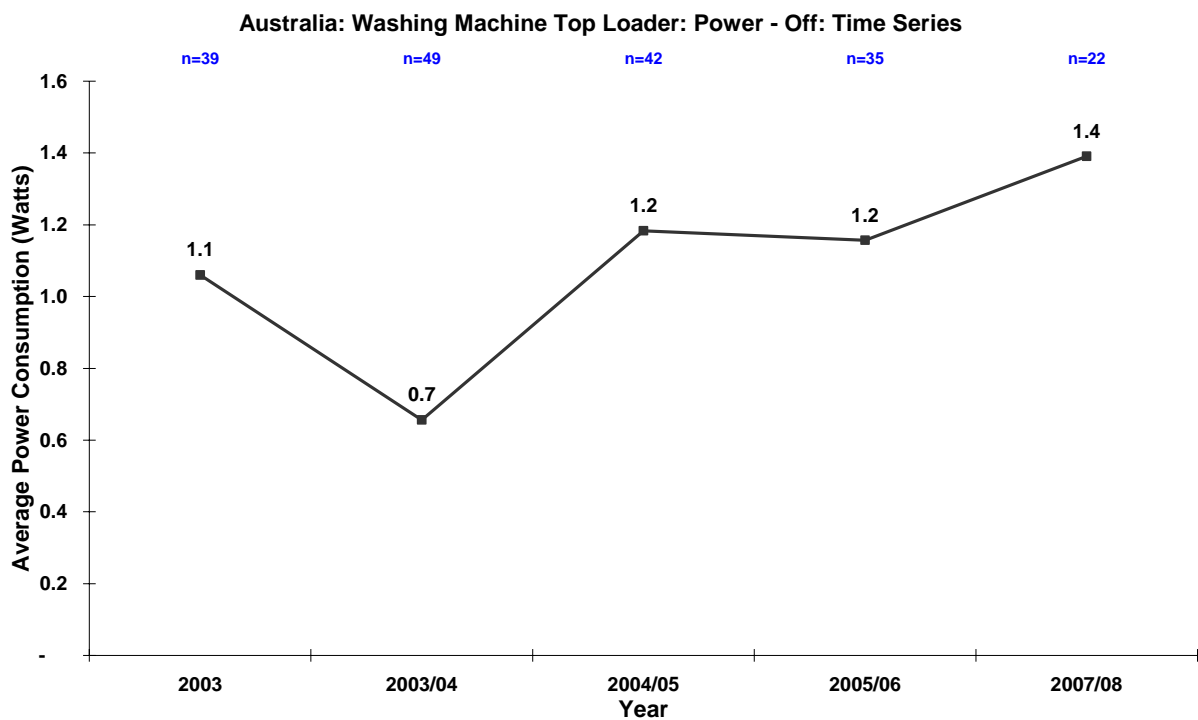
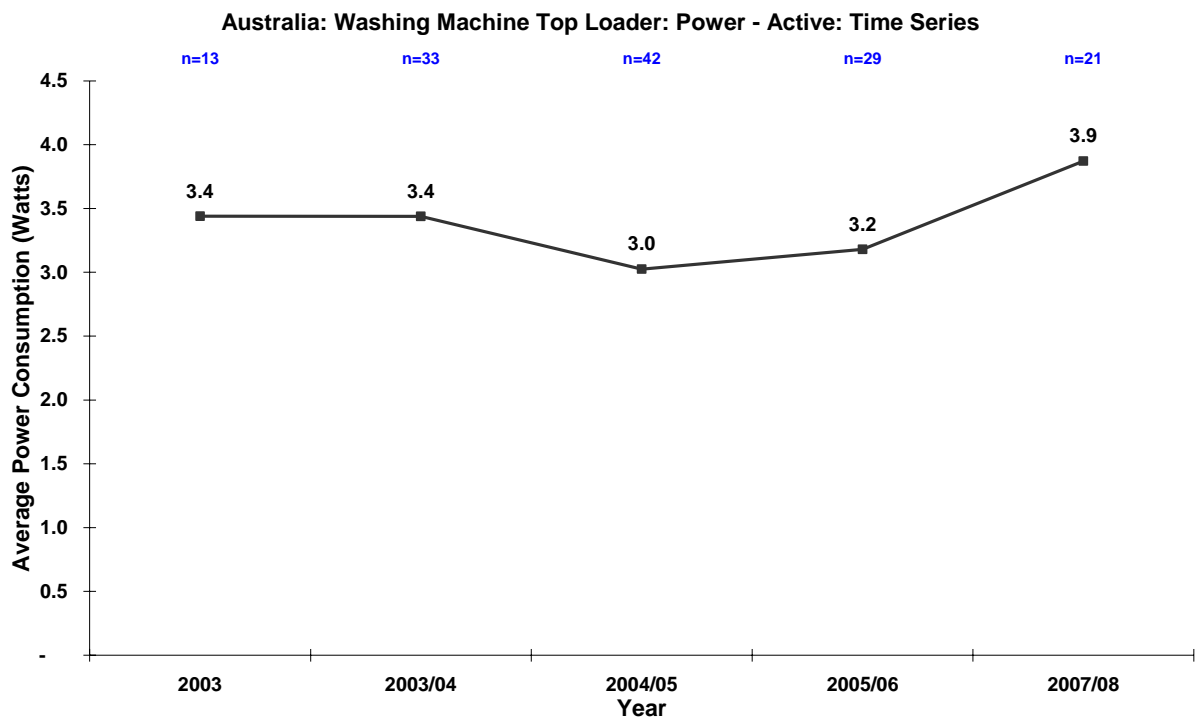


Figure 26 Australian Time Series Data – Washing Machine Top Loader Active Mode

Clothes washers – Front Loaders

Off mode consumption for front loading clothes washers in Australia has averaged at less than 1 watt for the last five years. Average active mode has remained stable at around 3.5 watts. No washing machines were surveyed in 2006/07 year. The results for off mode are presented in Figure 27, while Figure 28 represents active standby mode.

Figure 27 Australian Time Series Data – Washing Machine Front Loader Off Mode

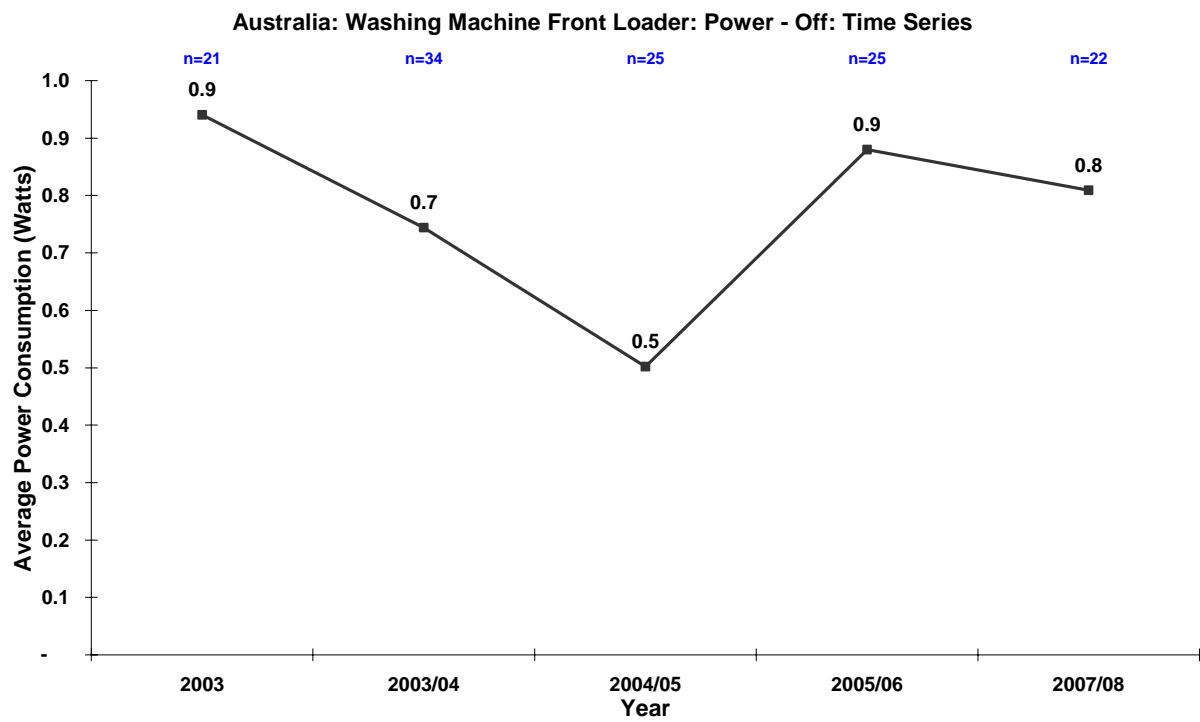
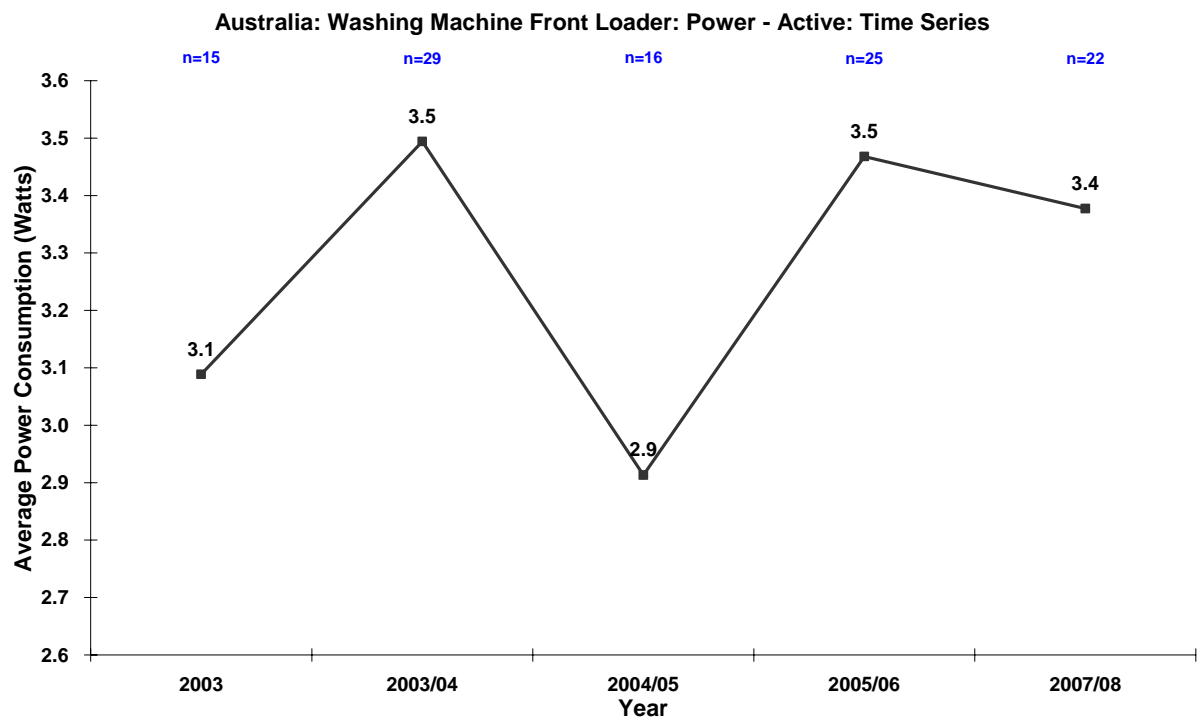


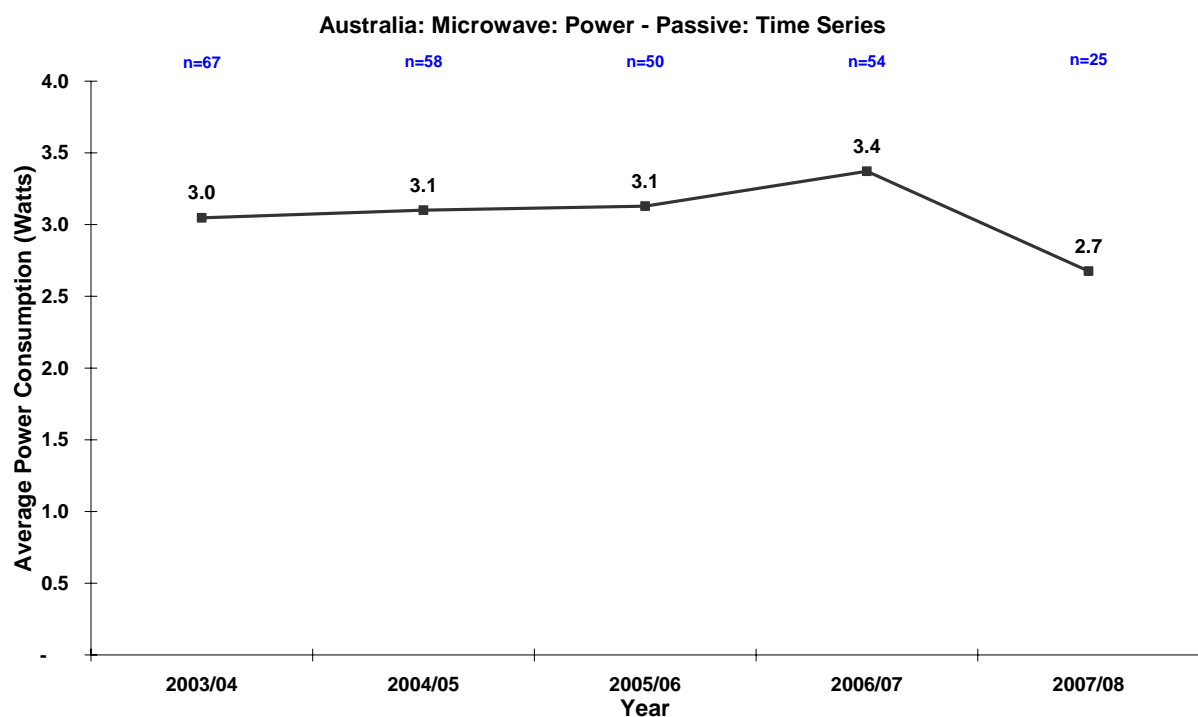
Figure 28 Australian Time Series Data – Washing Machine Front Loader Active Mode



Microwaves

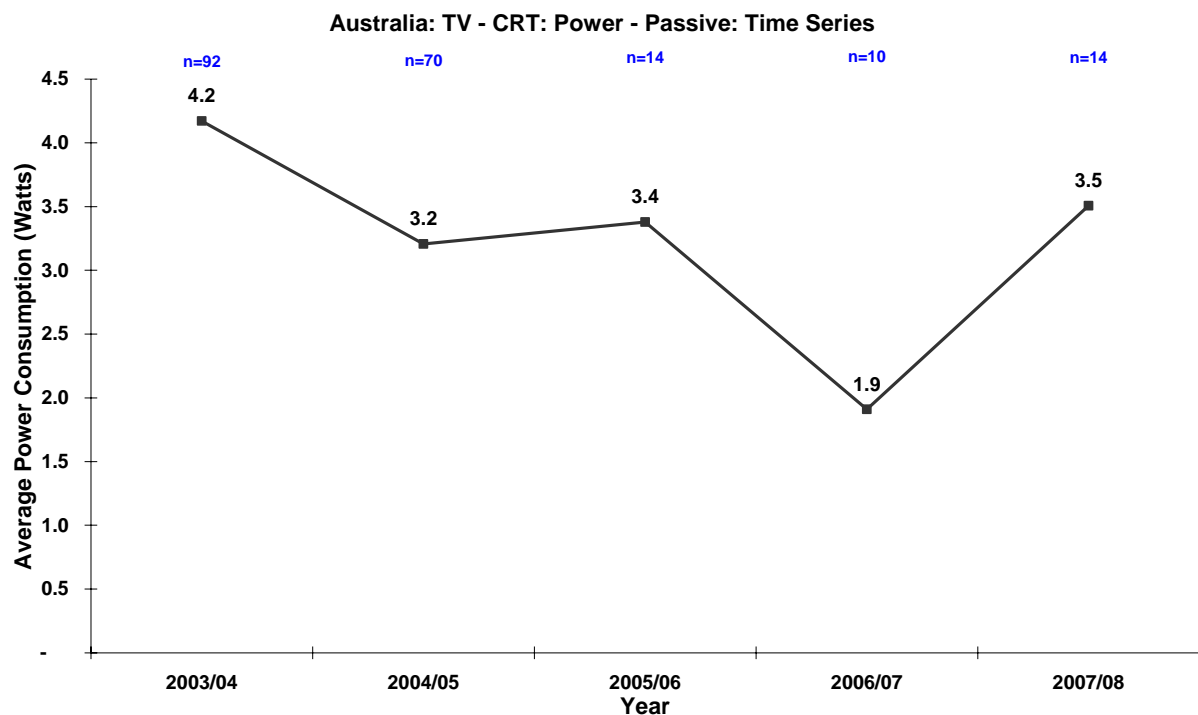
As shown in Figure 29 passive standby for microwave ovens has remained stable since 2003/04. However the latest survey recorded a statistically significant decrease in consumption which if validated in the next data collection period may be the beginning of a downward trend.

Figure 29 Australian Time Series Data – Microwave Passive Mode



Televisions – CRT

Average passive standby consumption for CRT televisions reduced significantly in 2004/05 from around 4.2 watts to 3.2 watts. Data collected in 2006/07 also indicated another decrease in average consumption however recent data has shown levels remain stable at around 3.5 watts.

Figure 30 Australian Time Series Data – CRT TV Passive Mode

Televisions – LCD

Average consumption for LCD televisions has dropped significantly over the past five years to be close to zero. As demonstrated in Figure 31 average consumption for last two years has been below 0.2 watts.

After taking a significant drop in average consumption in 2004/05 the passive mode for LCD is currently stable at around 2 watts. The 2007/08 data shows a small decline that if backed up by future surveys may become a downward trend. As shown in Figure 32 the latest survey found average passive standby for LCD televisions to be 1.6 watts.

Figure 31 Australian Time Series Data – LCD TV Off Mode

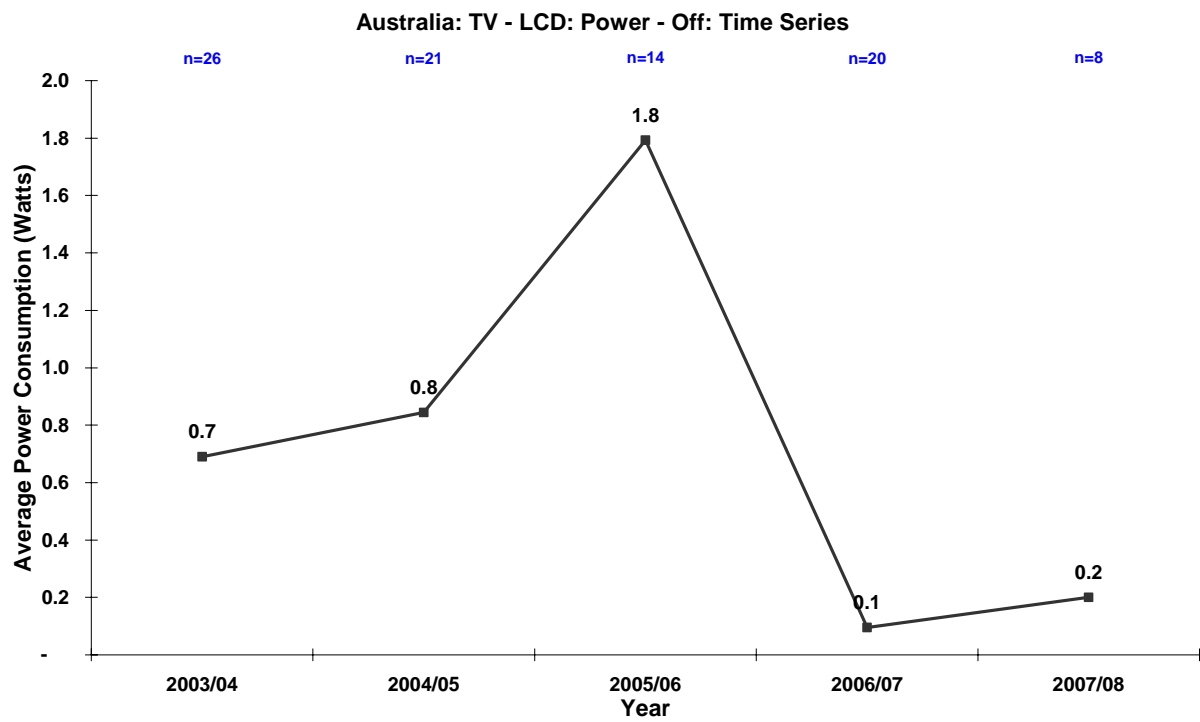
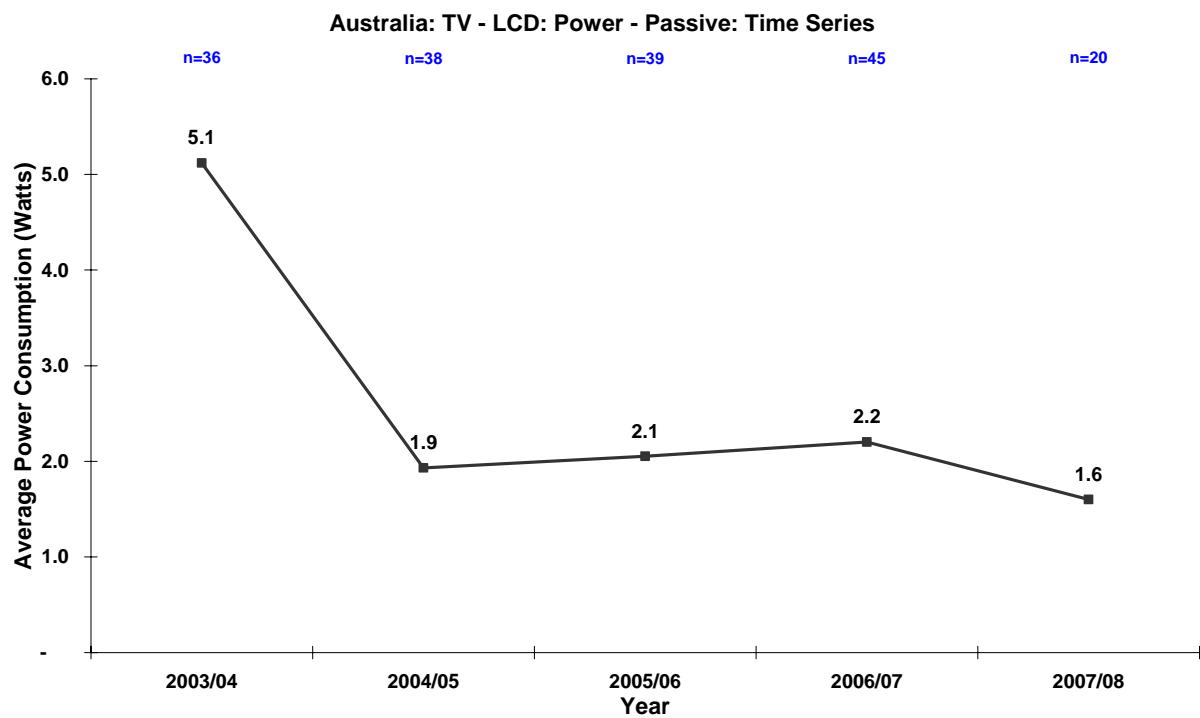


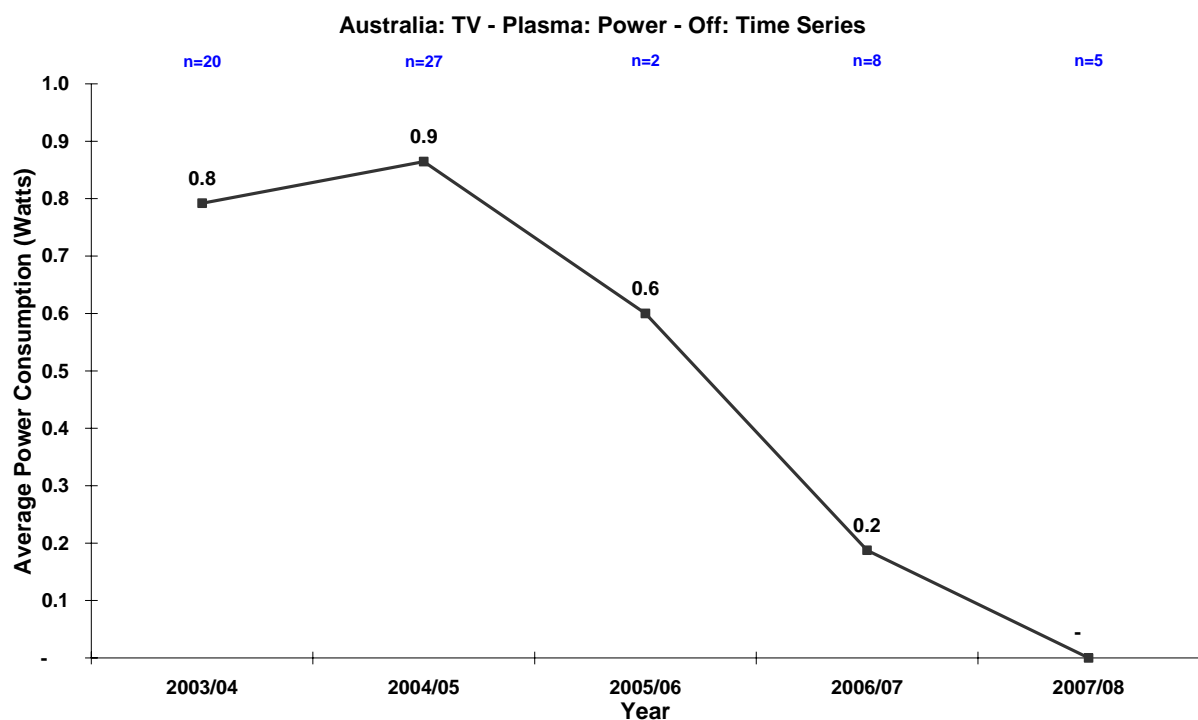
Figure 32 Australian Time Series Data – LCD TV Passive Mode



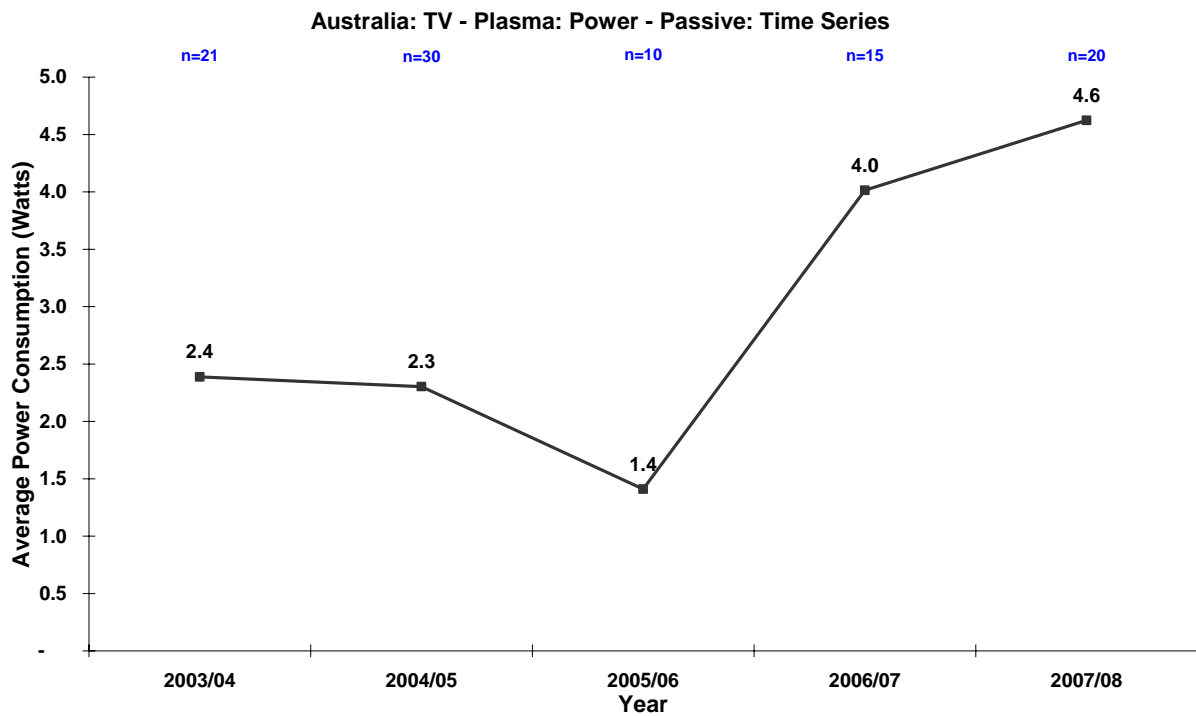
Televisions – plasma

The presence of off mode on plasma televisions has been declining over the past 5 years. Additionally the amount of consumption in off mode has been declining constantly to the point in 2007/08, where no models were found consuming energy in off mode. This steady decline is clearly visible in Figure 33.

Figure 33 Australian Time Series Data – Plasma TV Off Mode



Passive standby consumption in plasma televisions was viewed as stable until the last two years when the average consumption nearly doubled from around two watts to around four watts. However on closer investigation it would seem this increase is due to one brand that has models consuming at least 15 watts more in this mode than all other brands. If this brand was removed from the survey average passive standby would have declined over the last two years to be below 1 watt in 2007/08. In previous surveys, models from this brand fell within a more modest range of consumption in passive standby mode.

Figure 34 Australian Time Series Data – Plasma TV Passive Mode

DVD players

The time series data for DVD players in passive standby mode is shown in Figure 35. This chart demonstrates the constant decline in average passive standby consumption which was 2.6 watts in 2003/04, decreasing to 1.2 watts in 2007/08.

In the area of active standby it would appear little has changed over the last five years with average consumption this year returning to above 11 watts as it was in 2003/04. These results are shown in Figure 36.

Figure 35 Australian Time Series Data – DVD Player Passive Mode

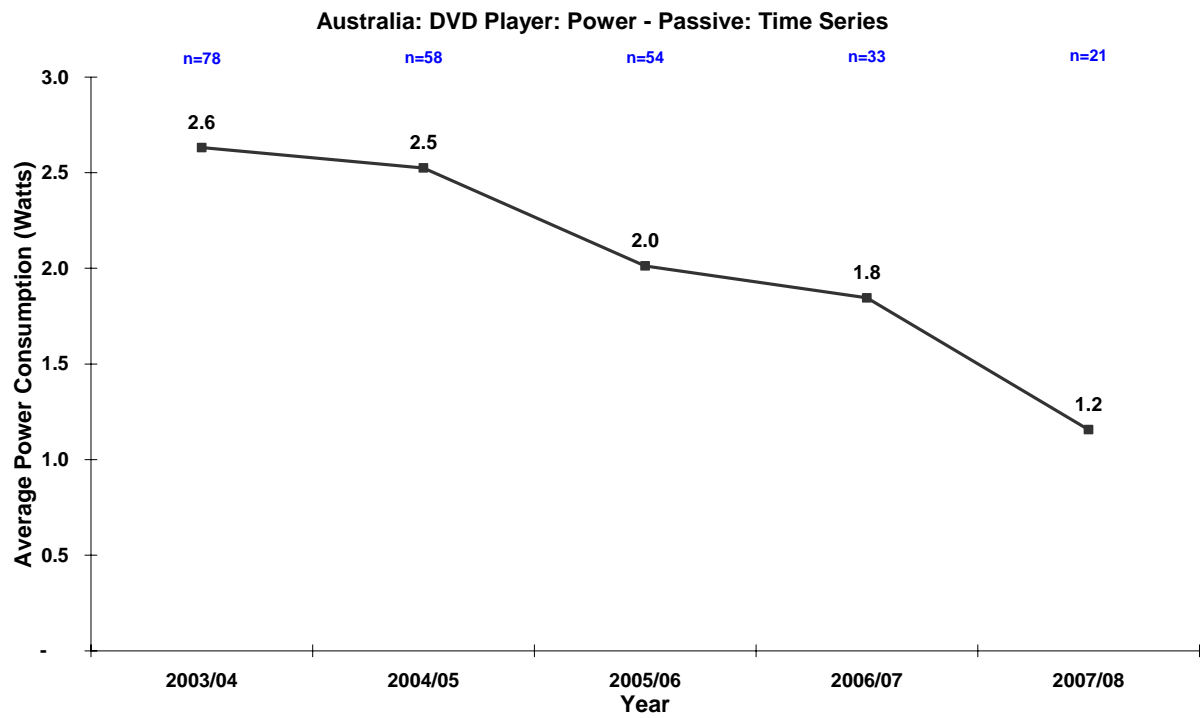
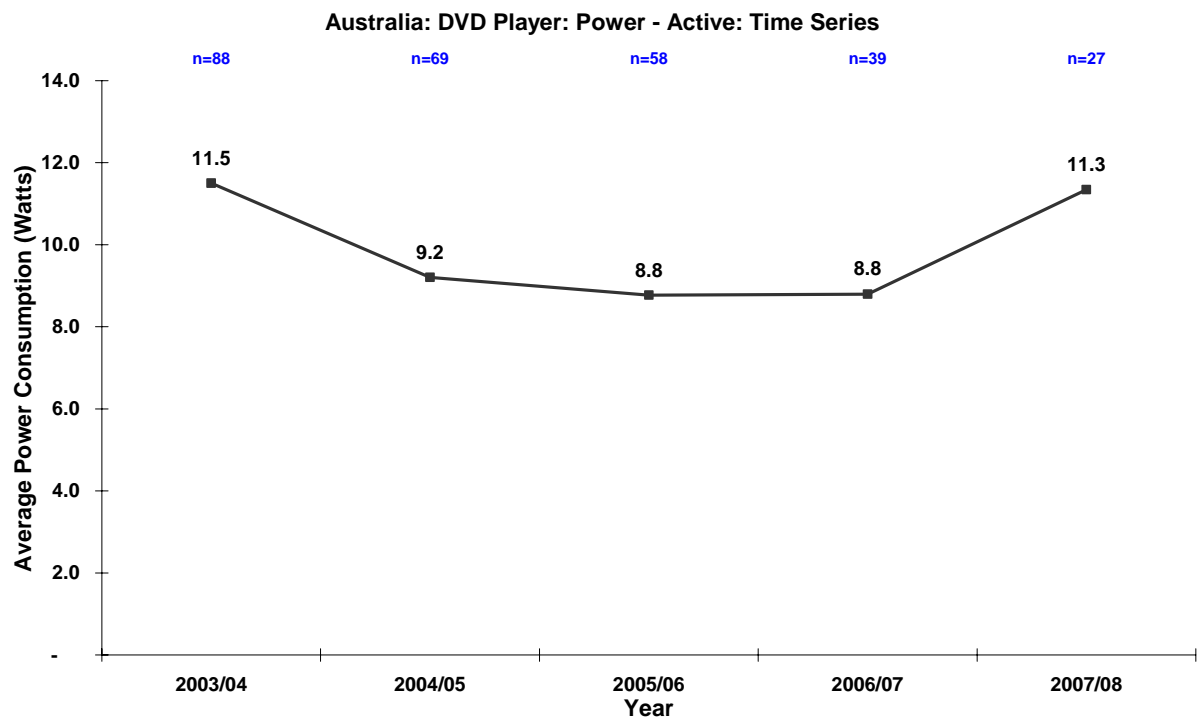


Figure 36 Australian Time Series Data – DVD Player Active Mode



Integrated Stereos

The time series data for integrated stereos shows that both passive and active mode consumption have been stable since 2003/04. However as can be seen in Figure 37 and Figure 38, a significant drop in both average passive and active consumption was seen in 2007/08.

Figure 37 Australian Time Series Data – Integrated Stereo Passive Mode

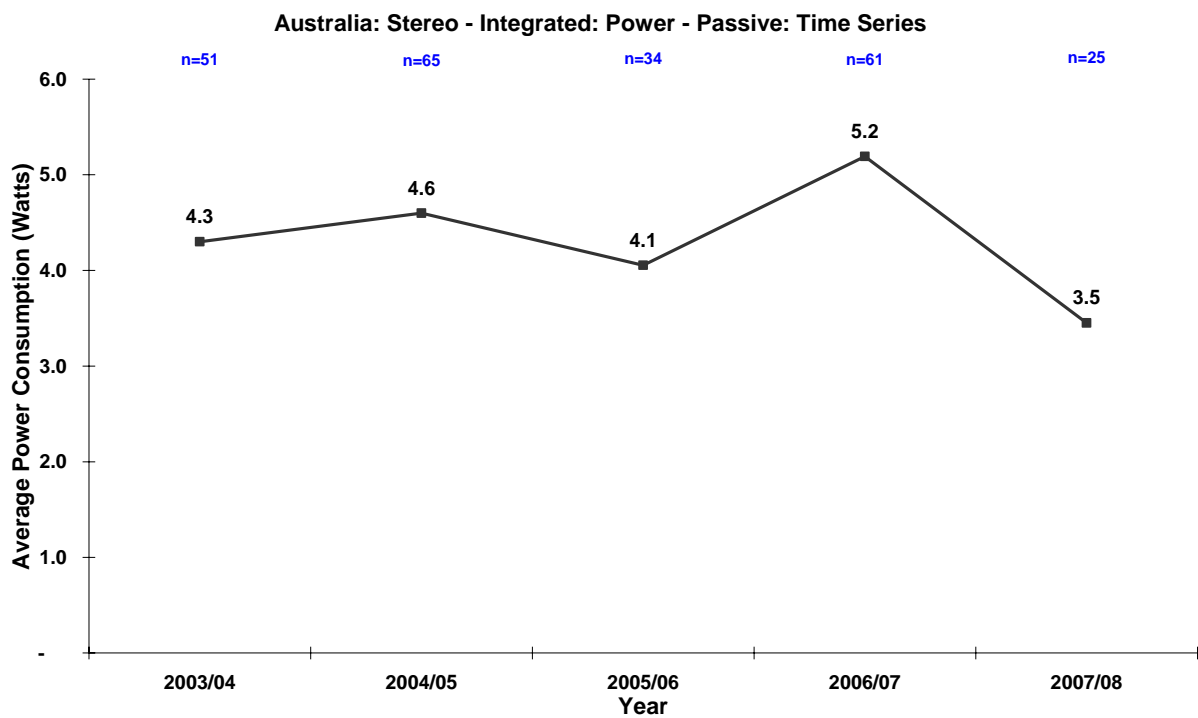
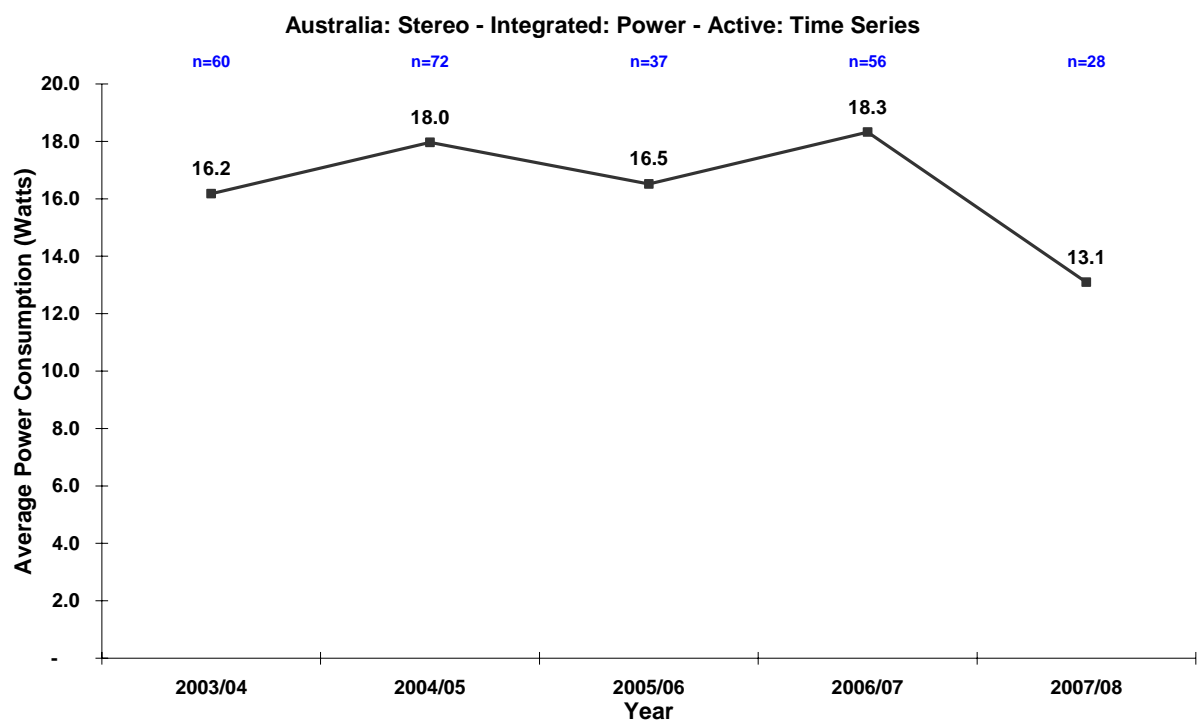


Figure 38 Australian Time Series Data – Integrated Stereo Active Mode

Portable Stereos

Off mode consumption for portable stereos is shown in Figure 39 and demonstrates that consumption for this mode has been stable at less than 2 watts since 2003/04. (No units surveyed in 2006/07 had off mode). In contrast Figure 40 shows passive consumption has been slowly increasing over time, rising from 1.9 watts to 2.6 watts. This increase is only marginal and not yet statistically significant; however it is constant and may be due to the increasing use of clocks and digital displays on portable stereo units. Active data as shown in Figure 41 has also remained stable for the past five years.

Figure 39 Australian Time Series Data – Portable Stereo Off Mode

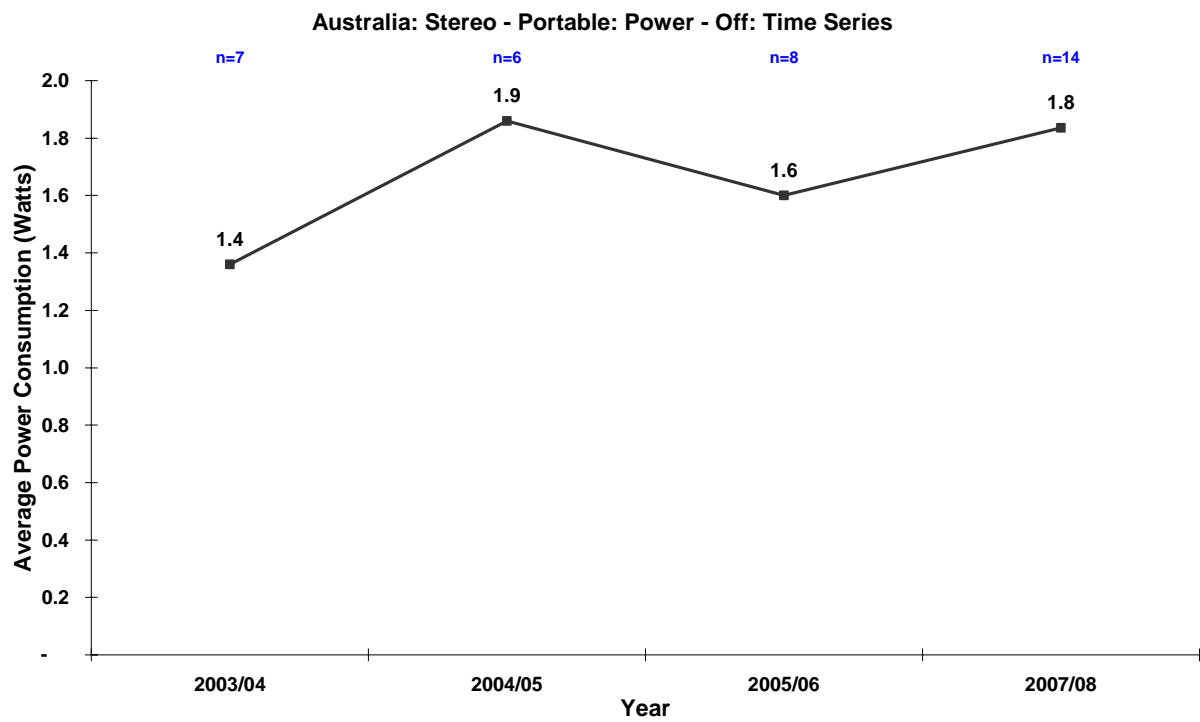


Figure 40 Australian Time Series Data – Portable Stereo Passive Mode

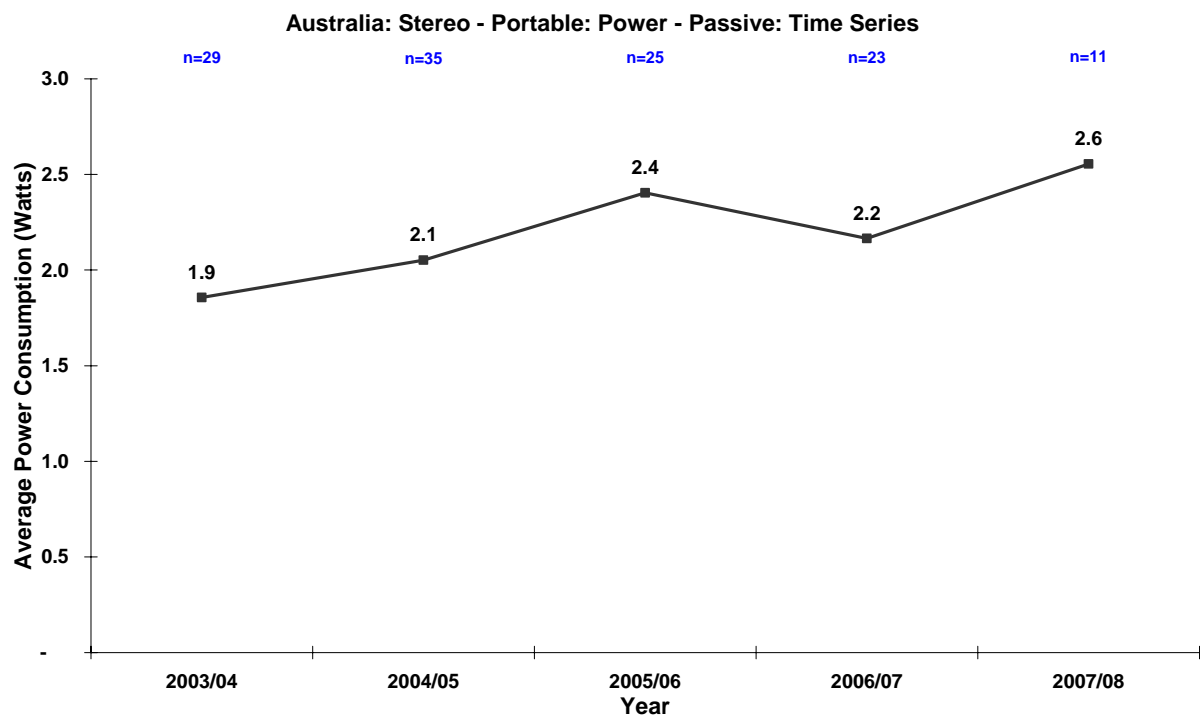
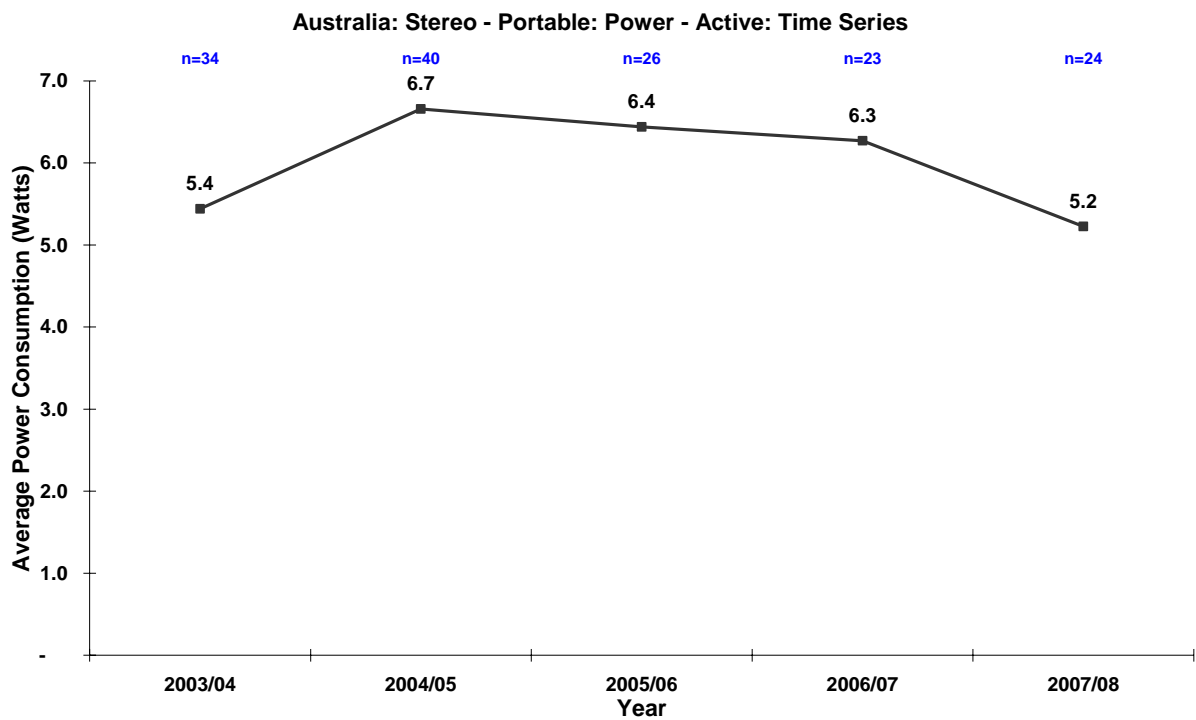
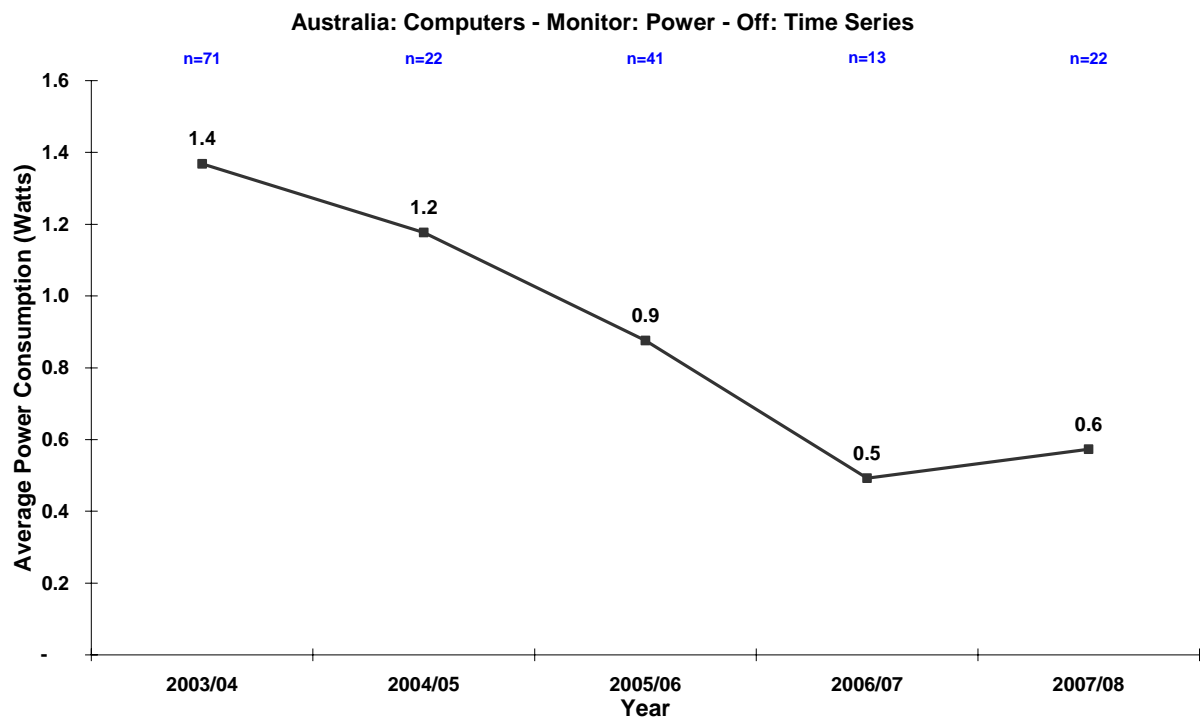


Figure 41 Australian Time Series Data – Portable Stereo Active Mode

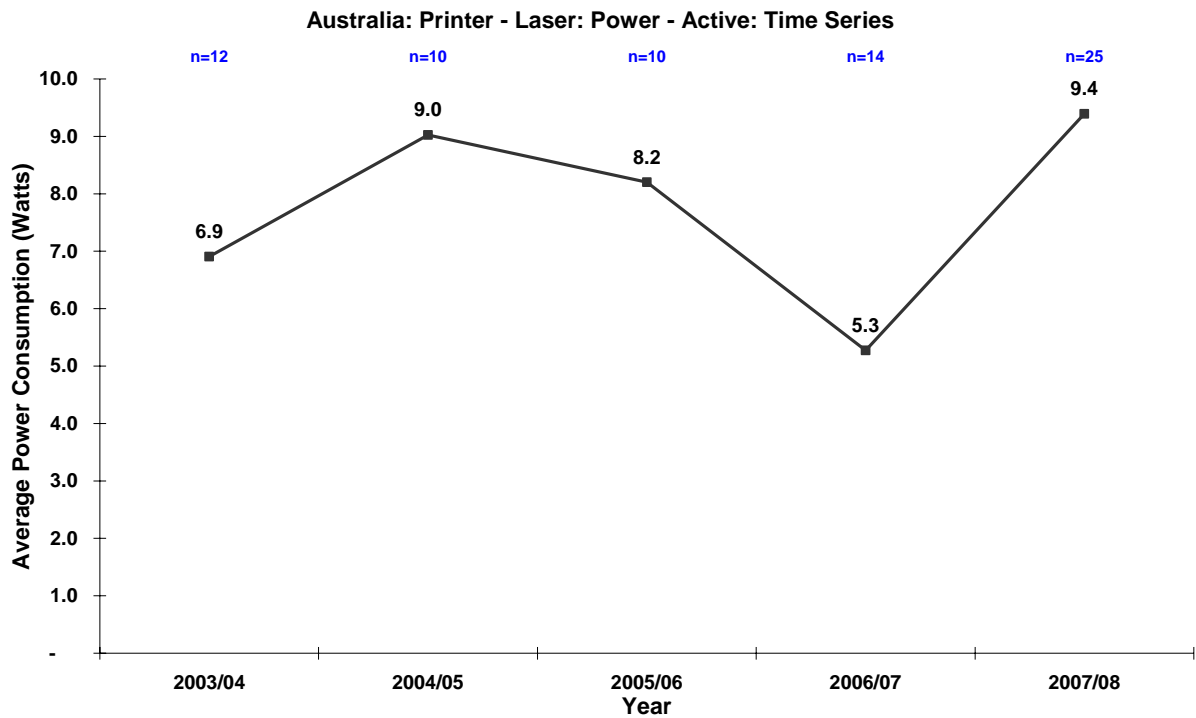
Computer Monitors

Figure 42 shows the average consumption of Computer Monitors appears to be stabilising after experiencing a constant decline since 2003/04. This decline can be attributed to the decrease in CRT monitors, to the point where all monitors found in the last two surveys were LCD Screens. The current average consumption in off mode is now around half a watt.

Figure 42 Australian Time Series Data – Computer Monitor Off Mode

Printers – Laser

Laser printers have consistently had no consumption in off mode and as shown in Figure 43 the active mode consumption for these products must also be considered stable over the last five years. Results have provided no constant patterns thus indicating that the fluctuations in consumption data are a result of sampling variations rather than any trend.

Figure 43 Australian Time Series Data – Laser Printer Active Mode

Printers – Inkjet

Off mode consumption for inkjet printers declined significantly since 2004/05, with average consumption sitting around 1 watt for the past 3 years. Active mode consumption for these printers also declined around the same time from 5 watts to less than 4 watts. It should be noted that since 2005/06 it has not been possible to test two major brands of printers as they swapped to external power supplies which are not displayed in stores. Analysis of the data would suggest that the decline in consumption cannot be solely attributed to this and improved technology has also played a part in the shift. There has also been a decrease in the amount of inkjet printers available in stores with many of the shelves once reserved for printers now being filled with multi function devices. Figure 44 and Figure 45 demonstrate these results.

Figure 44 Australian Time Series Data – Inkjet Printer Off Mode

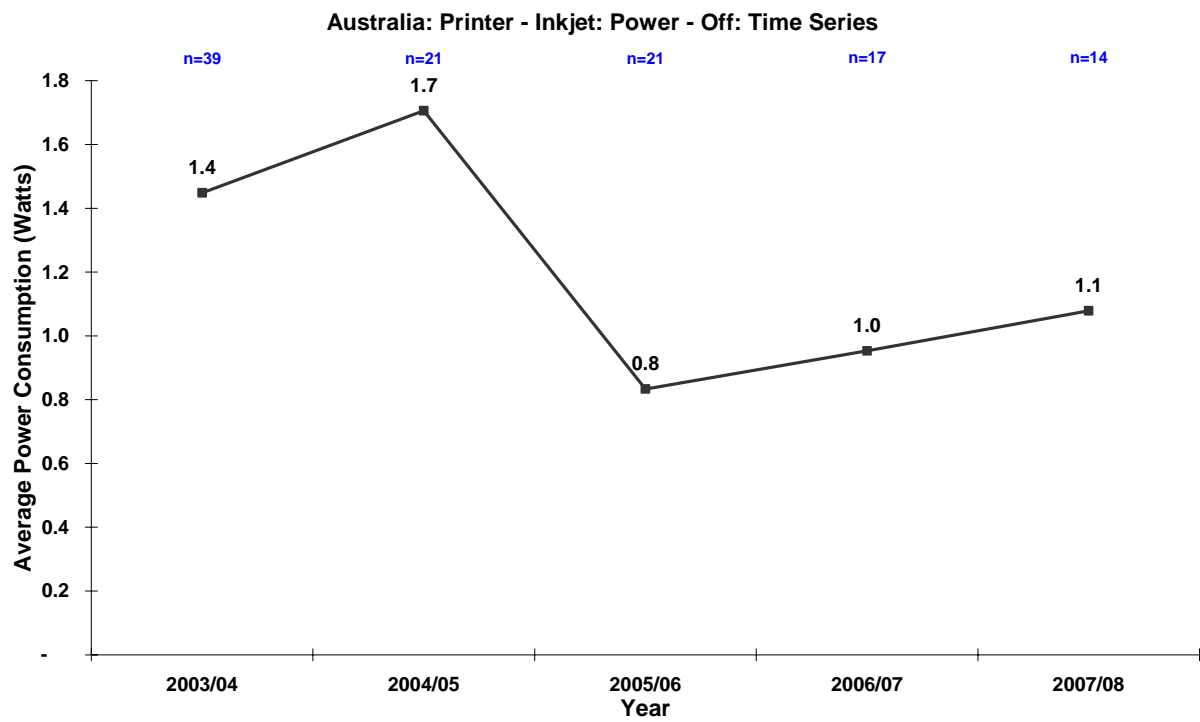
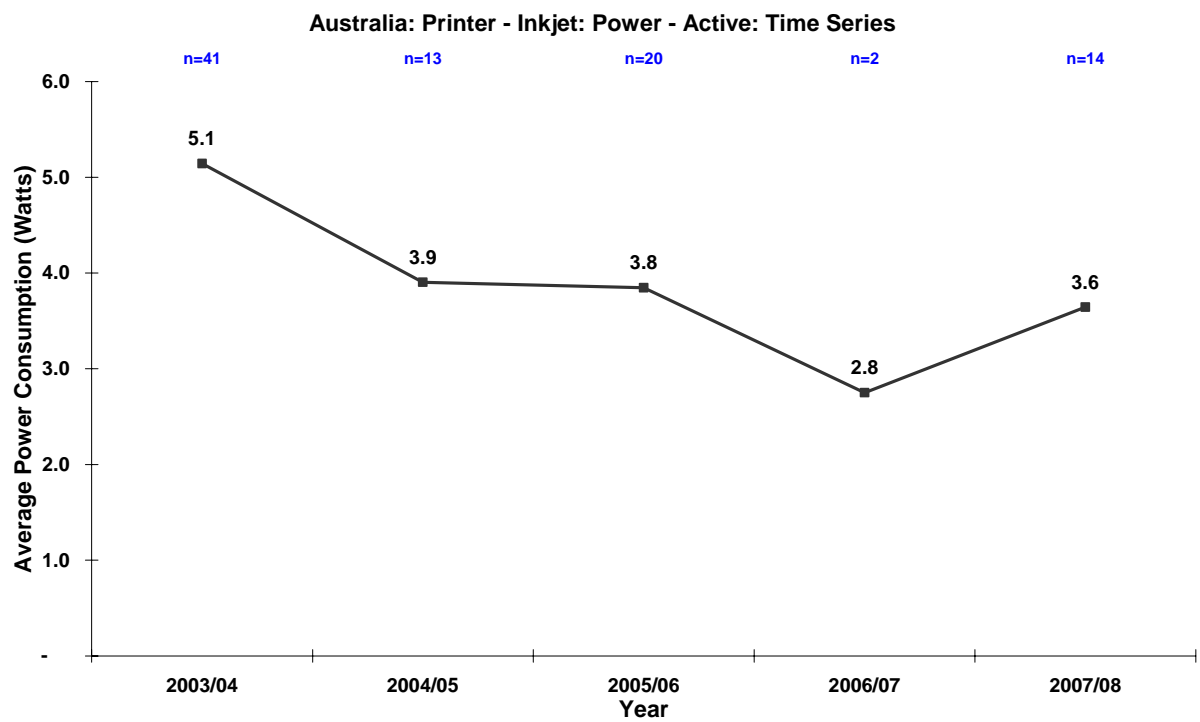


Figure 45 Australian Time Series Data – Inkjet Printer Active Mode



Multi-Function Devices (MFD's)

Multi function devices have become more common place over the survey period. As clearly demonstrated in Figure 46 average off mode consumption for multifunction devices has steadily declined since 2003/04 from 6.8 watts to 1.4 watts in 2007/08.

Figure 46 Australian Time Series Data – Multi Function Device Off Mode

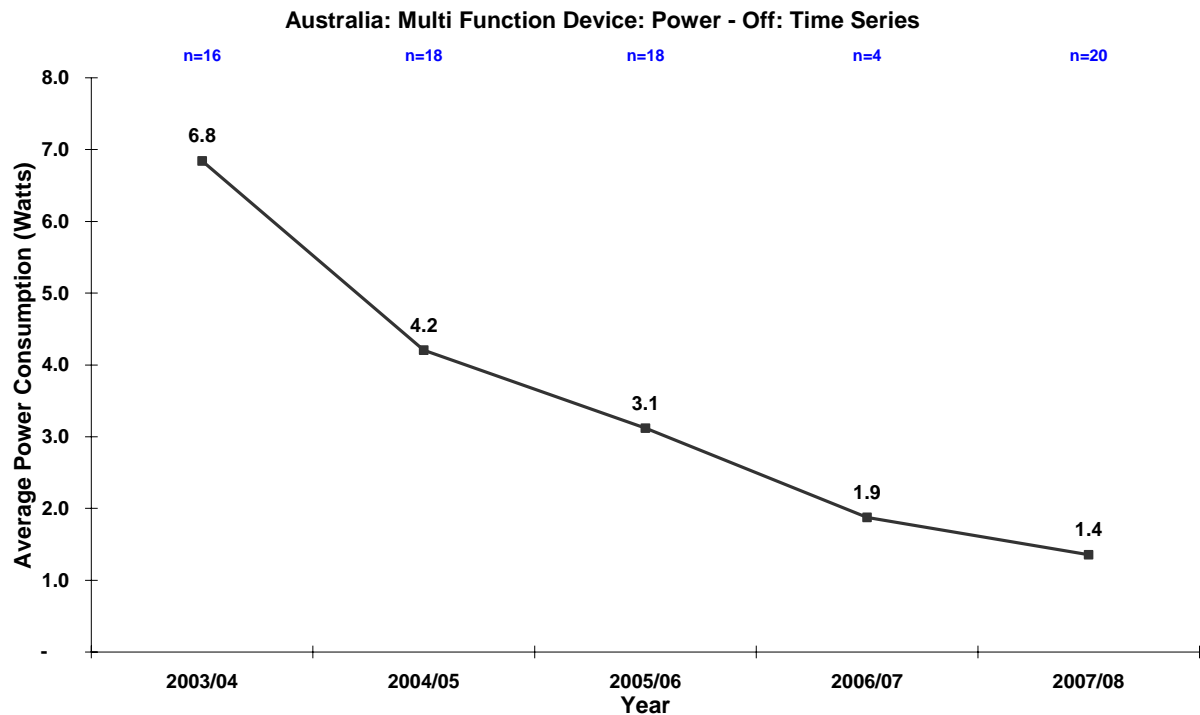
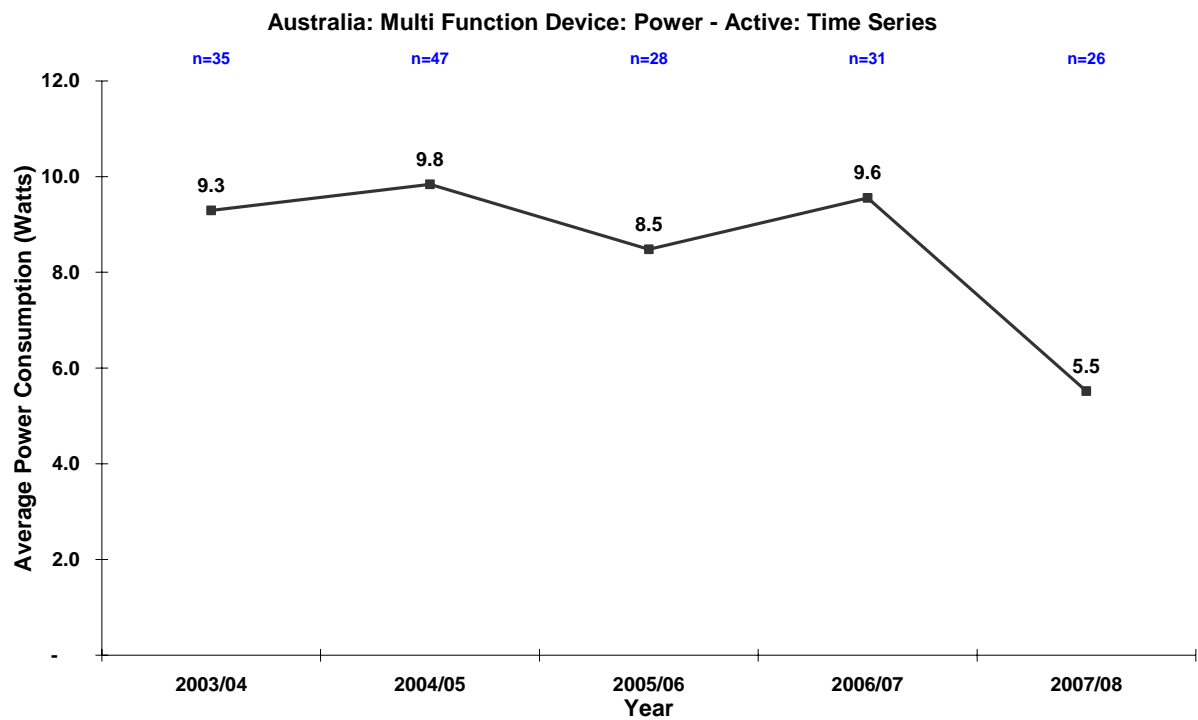


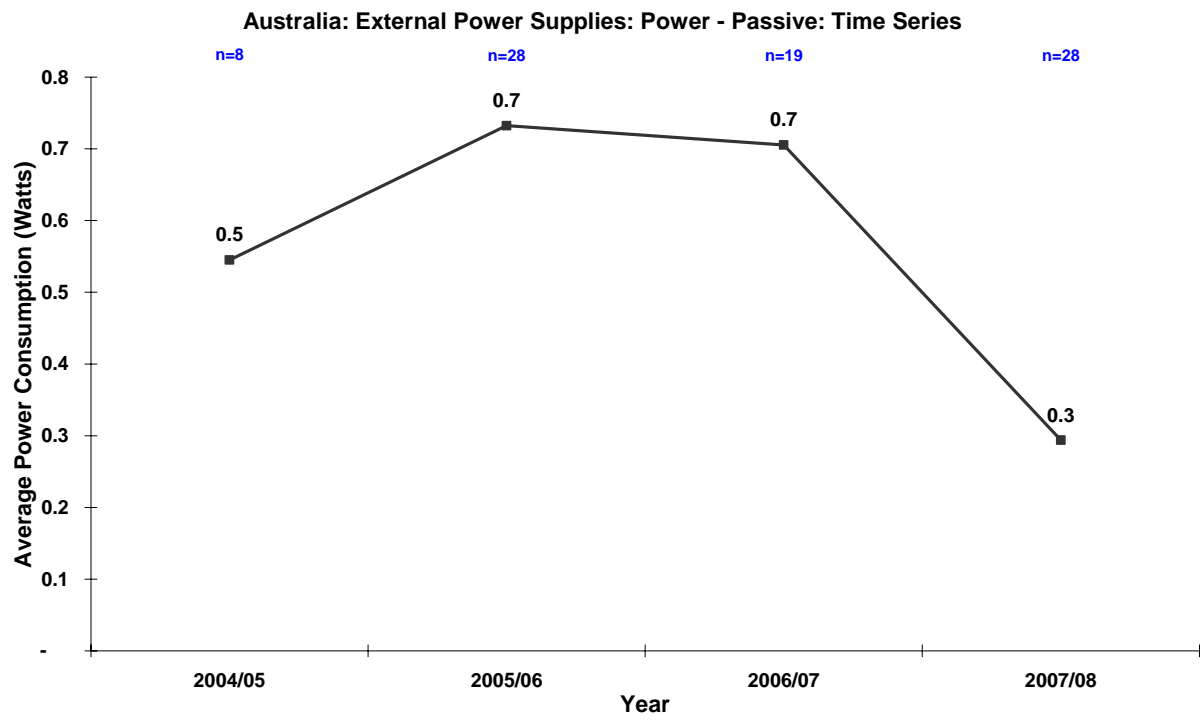
Figure 47 shows that until this year the average active power consumption for multifunction devices was stable. The 2007/08 survey saw this drop from around 9 watts to just 5.5 watts. This is a statistically significant decrease however it is likely that it is simply a reflection that this year's sample did not locate any laser printer MFDs .

Figure 47 Australian Time Series Data – Multi Function Device Active Mode

External Power Supplies

External power supply consumption has been less than 1 watt for the past five years. In 2007/08 it has reached its lowest average consumption at 0.3 watts. The results for this product are presented in Figure 48

Figure 48 Australian Time Series Data - External Power Supplies Passive Mode



Product Data by Brand

The brand and model identifiers in the survey data are generally useful for the following three broad areas:

- data verification/cleaning
- comparisons of products by countries; and
- trends of brands by product – time series & country

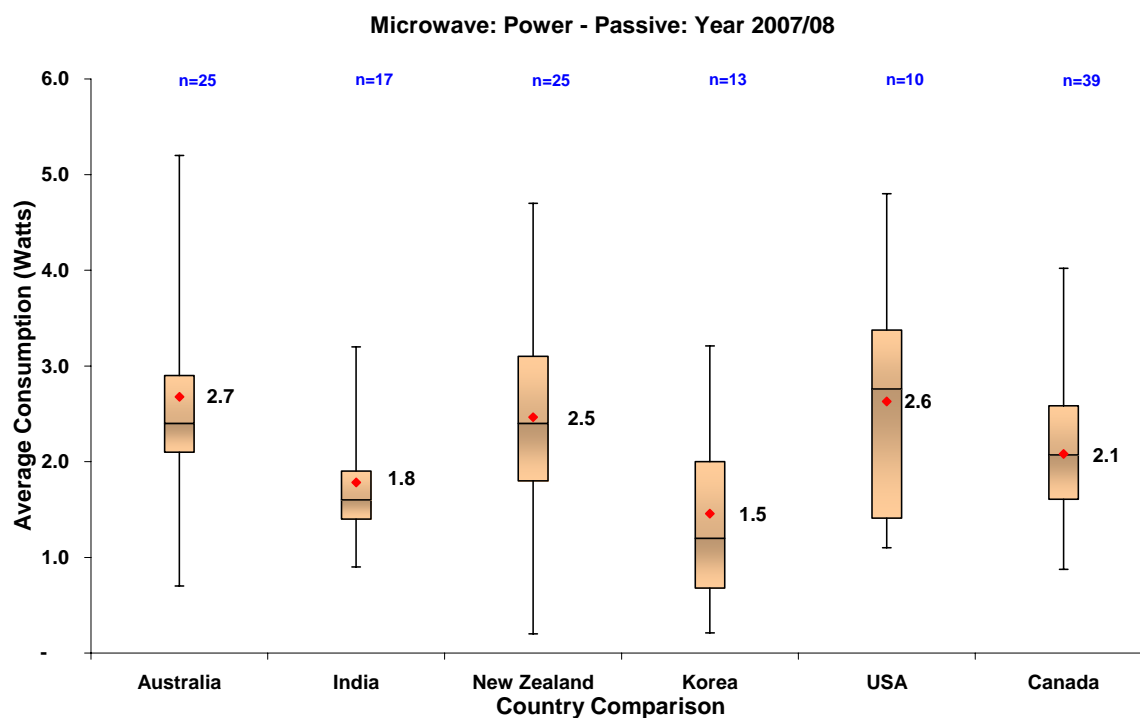
At this stage, brand and model identifiers are not available for the complete data set. Therefore, this report highlights the usefulness of brand and model identified data for analysis purposes; rather than compare particular brands. Brand comparison may be possible in future reports, if country survey data is supplied with the brand and model identified. The three broad areas listed above are described further in the following sections.

Data Verification/Cleaning

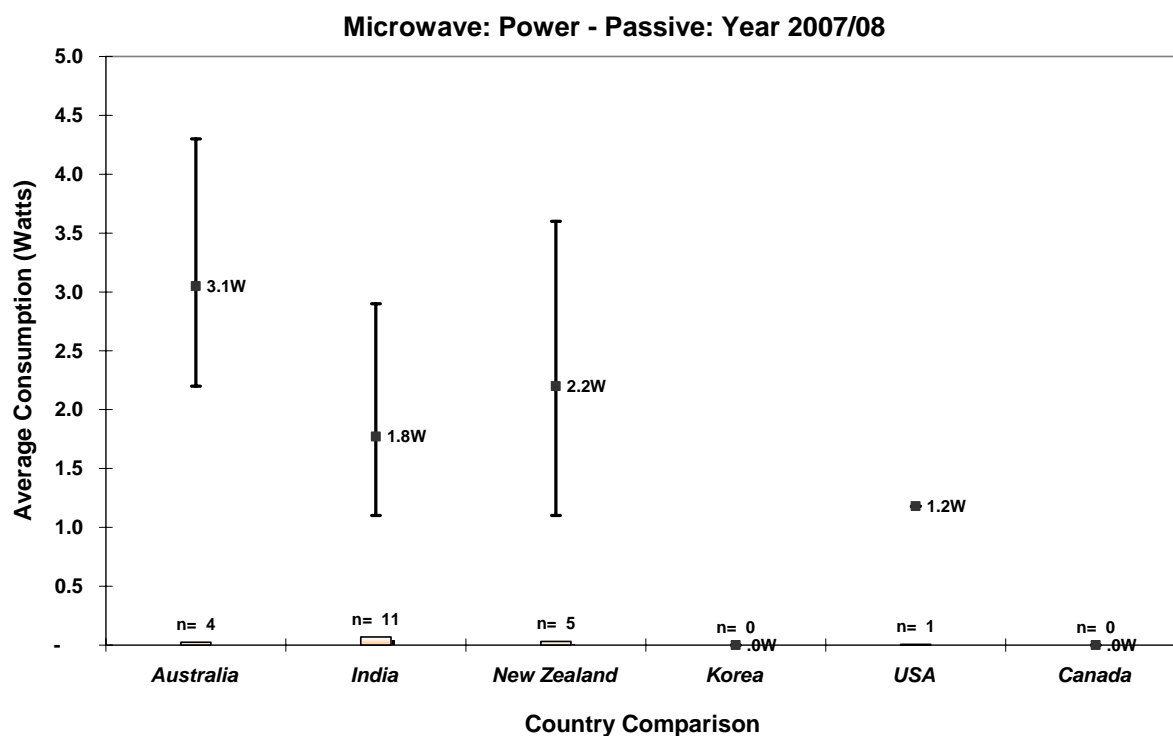
The model and brand identifier is used to verify the features and modes measured before analysis. This is particularly useful to validate a low power measurement for a product, if the model number is known, the features can be checked by examining on-line product manuals and the measurement validated. This has occurred for Microwave Ovens, where the presence of a display was required to be checked, to ensure that the measurement was for passive standby power. Or to request that the product be re-tested in later surveys to ensure greater accuracy. Similar checking is also done for TVs, HD Recorders, etc to ensure the model features are correctly entered or interpreted. The data needs to be validated and checked before aggregated results are published.

Comparisons of Products by Countries

The main differences between countries can often be explained by the presence of major suppliers. If some countries have a couple of dominant suppliers this will often translate to different average results. Analysis and explanation of the results is enhanced if the brands are known. For instance, for microwave ovens, the average standby power consumption in New Zealand & Australia is higher than India, due to the dominance of particular suppliers in India which have lower standby power for this product type as shown in Figure 49.

Figure 49 2007/08 International Comparison Microwaves Passive Mode

The brand information can be used to compare the same brand and product across countries. The information can highlight how the selected products for a particular brand can have a significant influence on the standby power consumption. The reasons for these different standby power levels by country can be a function product characteristics or features. Therefore to examine the reason for why India has lower average passive standby power, a particular brand was identified and the measurements for this brand are shown in Figure 50. This type of analysis shows that even a particular brand may not be the sole reason for why the result in India is lower than Australia and New Zealand. The underlying difference is likely to be due to particular models with different features being sold in India compared to Australia and New Zealand.

Figure 50 Power Passive: Microwave Ovens by Country: BRAND A

Trends of Brands by Product – Time Series & Country

The response of different suppliers to the challenge of standby power or the changes in product features that influence standby power consumption by a particular supplier can be observed over time. These trends can be particularly useful in discussions with suppliers on voluntary and mandatory policy options. The reason for up/down trends over time can often be related to the improvements in standby power by particular suppliers/brands. For instance, Figure 51 shows the passive standby power consumption for Plasma TVs over time for Brand A, while Figure 52 shows a similar trend for Brand B. It can be observed that Brand A is decreasing the standby power of the product over time, while Brand B is increasing the standby power consumption. This information can be used to approach the suppliers and discuss how they might address their product development to improve standby power or explain how they have met the challenge of reducing standby power. If voluntary policy options are being implemented, this information provides a useful tool for encouraging suppliers to take action. Eventually the information could be published to highlight those suppliers taking steps to reduce standby power.

Figure 51 Power Passive: Plasma TV - Brand A

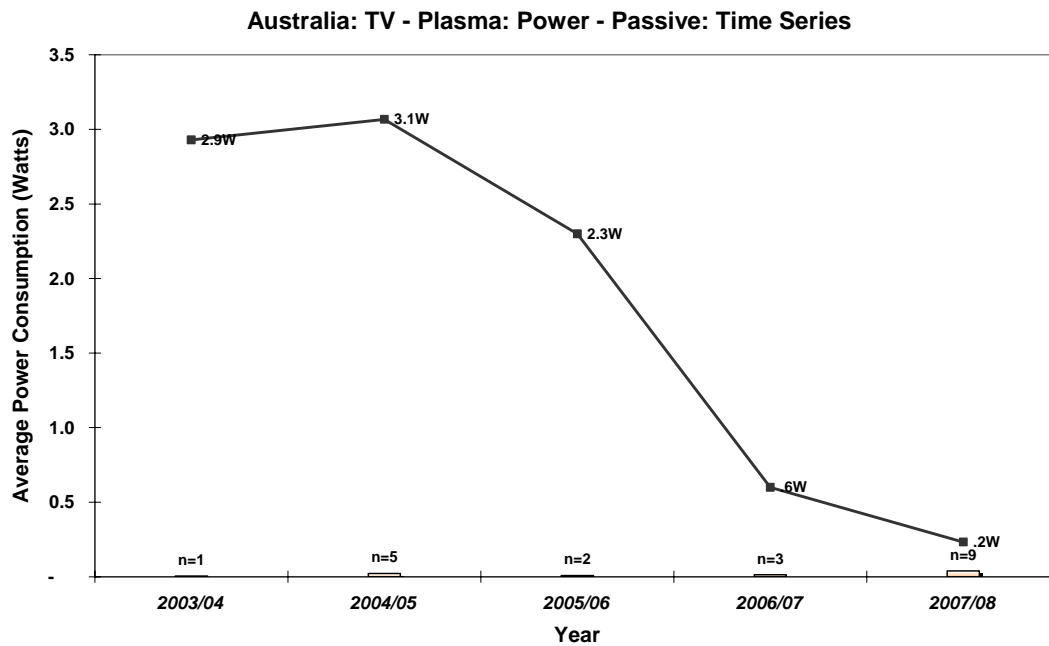
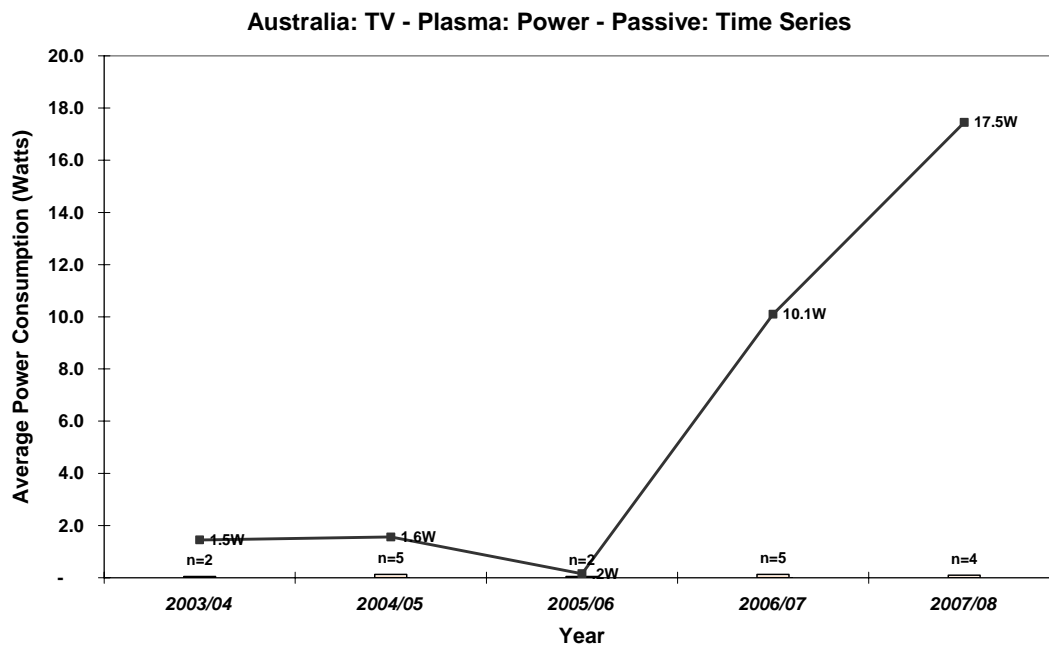


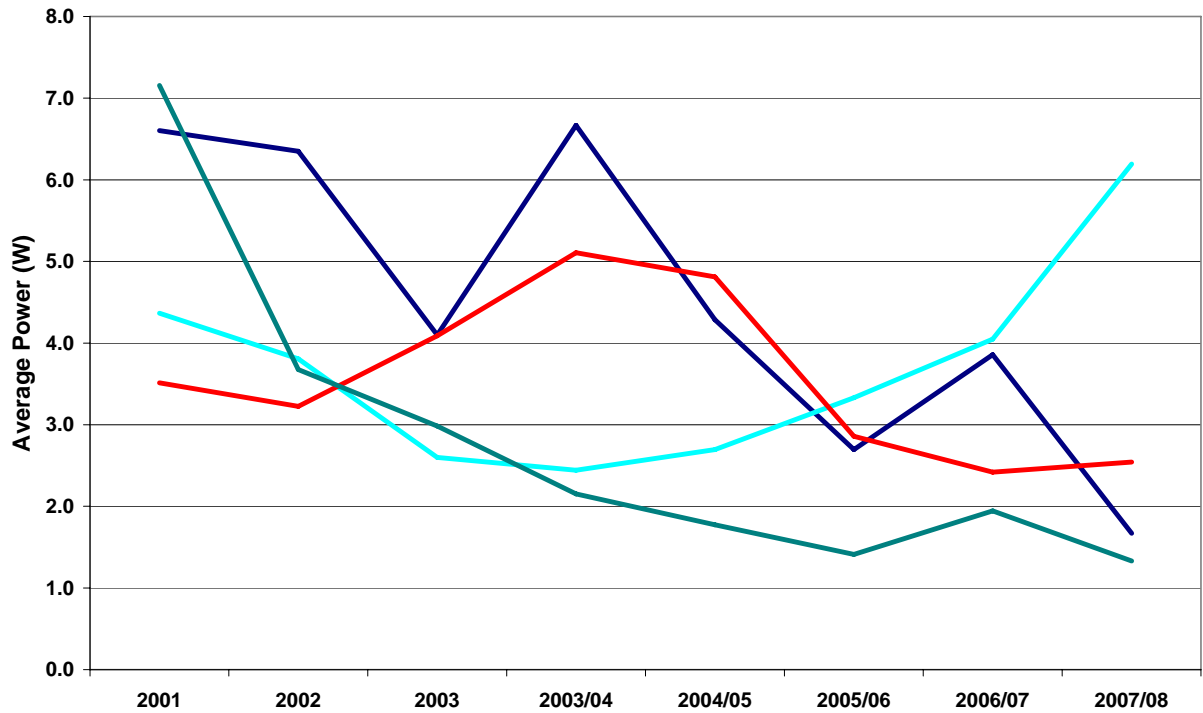
Figure 52 Power Passive: Plasma TV - Brand B



The average passive standby power consumption of a supplier’s entire range of products can also be compared over time, as shown in Figure 53. Again this information could be useful for tracking overall supplier responses to the standby power program/policy. In

this case, the **Light Blue** brand is showing increasing standby power trends in later years, against the mostly decreasing trends of the other brands.

Figure 53 Power Passive: All Products: Australia by Similar Consumer Electronic Supplier Brands



Appendix A

Basket of 29 Secondary Products

- Clothes dryers
- Dishwashers
- Clothes washer/dryer combination units
- Air conditioners
- Instantaneous (non storage) gas water heaters (with electronic ignition)
- Microwave ovens – manual timer
- Televisions – rear projection
- Set top boxes (including variations – digital/analogue tuners, hard drive)
- DVD recorders without hard drive (digital/analogue tuner)
- DVD recorders with hard drive (digital/analogue tuner)
- DVD/VCR combinations
- Video Cassette Recorders
- Audio visual receivers (home theatre)
- Subwoofers
- Computers (off mode only)
- Computer speakers
- Network switches (including hubs)
- Routers
- DSL or ADSL modems
- Scanners
- Facsimiles (fax machines)
- Photocopiers – black and white (categorise by copy speed)
- Photocopiers – colour (categorise by copy speed)
- Telephone answering machines
- Cordless phones – primary base station
- Cordless phones – secondary base station
- Cordless phones – with answering machine

Other Products Measured

- Breadmakers
- Computers - Home Theatre Box
- Cook tops (Hob), Ovens and Stoves (upright Cooker)
- Digital Photo Frames
- Espresso Machines
- Fans
- Game Consoles
- Hand-held Vacs
- Heaters - Electric Portable
- Heaters - Gas
- Assorted Home Entertainment products
- Home Theatre Systems
- Juicers
- Range Hoods
- Rice cookers
- Shredders
- Slow Cookers
- Speakers
- Toasters
- Treadmills
- Typewriters
- Variety of small bench top Kitchen appliances
- Wine Chillers