

STANDBY PRODUCT PROFILE 2003/01
OCTOBER 2003



DVD/SACD/CD/VCD

PRODUCT PROFILE



DVD PLAYERS/RECORDERS AND DVD/VCR COMBO

AUSTRALIA'S STANDBY POWER STRATEGY 2002 - 2012

AN INITIATIVE OF THE MINISTERIAL
COUNCIL ON ENERGY FORMING
PART OF THE NATIONAL
GREENHOUSE STRATEGY

The National Appliance and Equipment Energy Efficiency Committee seeks comment on this proposal from any interested person or organisation.

Please email comments to:

energy.efficiency@greenhouse.gov.au

Alternatively, hard copy comments can be mailed to:

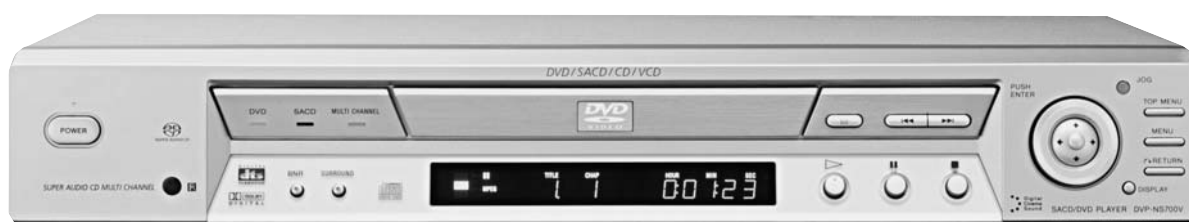
DVD Players Product Profile
Equipment, Appliances & Transport Team
Built Environment & Communities Branch
Australian Greenhouse Office
GPO Box 621
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Comments received by 30 December 2003 will assist in determining the final form of the policy proposals taken to government regarding DVD players.

An electronic version of this Standby Product Profile and other Profiles released for public discussion can be obtained from www.energyrating.gov.au under standby.

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PRODUCT DESCRIPTIONS

Digital Video Disc players, more commonly known as DVD players, are gaining increasing popularity in the Australian market place. DVD players deliver superior sound and picture quality and compared to VCRs, offer much greater user convenience. DVD players are also able to play CDs and video games, and in some cases link to the Internet and even record and play home movies.

DVD players and DVDs themselves are subject to a regional zoning restriction that splits the world into a number of zones (Australia is zone 4). Discs are encoded with a region code and will only play on players with a matching region code (however some players are available that can read discs from all zones).

DVD technology is expanding rapidly and has seen the DVD/VCR and DVD recorders become more widely

available. The DVD/VCR allows you to watch DVDs while using the VCR to record. The DVD recorder market is somewhat more complicated. When first introduced, DVD recorders could be used to record DVD images from video (such as home movies) or from a computer. However since 2001 some DVD recorders can also record television images and hence function similarly to a VCR. This innovation is likely to see a rapid increase in ownership of the DVD recorder and eventual replacement of the standard VCR. The complication for the consumer is that there are five different format types (DVD-R, DVD+R, DVD-RAM, DVD-RW and DVD+RW) available for DVD and the format your appliance uses will determine what can be made and viewed. Some units are now able to read/record more than one format type, however to date there are no recorders that are able to read all five formats.

CURRENT OWNERSHIP AND TRENDS

DVD players became available in Australia from late 1997 with 'early adopters' and film enthusiasts initially dominating the market. However a rapid reduction in price, which has seen DVD players become competitive with VCRs, increased sales dramatically from 2000. GfK Marketing Services has tracked sales of the product since its introduction, reporting 4,541 units were sold in the first year. It is estimated that by March 2001 there were 400,000 players in Australian homes (AFC 2002). In October 2002, an article in "The Age" newspaper reported that sales of DVD players was expected to reach 800,000 per annum in 2002 (AGE 2002). Retail sales data for DVD players in Australia is shown in Table 1.

TABLE 1: AUSTRALIAN RETAIL SALES OF DVD PLAYERS, 1998- 2002

Year	Units Sold	Value (\$m)	Average Price (\$)
1998	4,541	\$5.6	\$1,229
1999	30,174	\$33.3	\$1,102
2000	167,727	\$112.4	\$670
2001	451,399	\$212.2	\$469
2002	912,293	\$305.6	\$335

Source: 1998-1999: GfK Marketing Services cited in AFC (2002).
2000-2002: GfK Marketing Services.

In 2001, the penetration and ownership of DVD players was reported in a NAEDEC commissioned study of standby power usage in Australian households (Harrington and Kleverlaan, 2001). Based on a telephone survey of 801 Australian households, penetration of DVD players was found to be at 8.2% in December 2000. An article printed in "The Age" newspaper in October 2002 estimated that penetration of DVD players in 2002 is about 25% (The Age 2002). Table 2 summarises the results of the NAEDEC survey.

TABLE 2: OWNERSHIP DATA FOR DVD PLAYERS - AUSTRALIA

DVDs	Phone survey conducted Dec 2000
Penetration	8.2%
Ownership	0.089
Saturation	1.0909

Source: Harrington and Kleverlaan, 2001

As a new product that has quickly gained acceptance in the Australian market place, penetration and ownership trends for DVD players are likely to show dramatic increases over the next 5 years.

As DVD recorders and DVD/VCRs are recent additions to the Australian market place, few statistics are available. In 2002 worldwide shipments of DVD recorders reached 1.5 million and are expected to be over 11 million units in 2005 (Shim 2003). It is estimated that at the beginning of 2002 approximately 15,000 DVD recorders were in Australian homes (Dasey 2002). The demand for recorders is expected to increase rapidly as the retail price decreases. For example Philips Australia cut the price of its DVD recorder by 36 percent in 2002 and predicts that DVD recorders will occupy 50% of the DVD home entertainment market by 2004 (Colley 2002). Table 3 below shows the sales figures of DVD recorders from data collected by GfK Marketing Services. The figures show that over three thousand units were sold in 2002 at a value of \$6.8 million.

TABLE 3: AUSTRALIAN RETAIL SALES OF DVD RECORDERS, 2001- 2002

Year	Units Sold	Value (\$)	Average Price (\$)
2001	87	\$302,110	\$3,473
2002	3,113	\$6,845,000	\$2,199

Source: 2001-2002: GfK Marketing Services.

RELEVANT MODES FOR THE 'ONE WATT' POWER PLAN

DVD players/recorders available in Australia have four operational modes: on, active standby, passive standby and off. The on mode is not generally relevant for the standby power plan, although the on mode power consumption and the hours of use are critical in determining total energy consumption of DVD players/recorders.

Active standby mode applies to DVD players/recorders that have been switched on (activated) and are ready to play a disk. In this mode, most units have some kind of visual display communicating the activation status to the user. All DVD players/recorders on the market have this mode.

A standard feature of virtually all DVD players/recorders is the ability to put the unit 'to sleep' either via a remote control or manual standby switch. This mode is commonly referred to as **Passive Standby**. Many DVD players/recorders also put themselves to sleep (to Passive Standby mode) when they have not been used for some time. This default facility is a requirement of the GEEA endorsement label in Europe. This feature is likely to be important for improving the future energy savings potential for DVDs and many other home electronics products.

Off mode, which is sometimes a 'hard' off, in theory disconnects the mains from most electrical circuits in an appliance. Normally the appliance cannot be activated with a remote control while switched "off". However, while some DVD players/recorders have a hard off switch, not all have zero power consumption when in this mode. It is a requirement of the GEEA endorsement label that a DVD must have an off switch.

By and large, for most DVD players/recorders available on the Australian market, passive standby is the lowest power state and as such, the unit can always be activated by a remote control.

In December 2000, the NAEDEC commissioned telephone survey investigated the usual method respondents used to turn off their appliances. The survey found that 45% of respondents turned off their DVD with the remote, 37% turned off their DVD at the unit and 18% used the switch on the wall. Table 4 summarises how DVD players are turned off, as found in the telephone survey.

While it appears that a high proportion of consumers turn their DVDs to off or passive standby mode, this doesn't always translate into zero power consumption. NAEDEC commissioned surveys of new products for sale in retail stores conducted in 2001, 2002 and 2003 have found that the proportion of DVD players with a hard off switch is declining. Of 39 DVD players measured in 2003, only 12 had an on/off capability while in 2001 approximately 36% of the units measured had an on/off switch. However, even in "off", the unit is still drawing some power in most cases. It should be noted that the remote control could not be located for 11 units in the 2003 survey and 7 units in the 2002 survey, as such passive standby measurements could not be collected for these products.

TABLE 4: HOW CONSUMERS SWITCH "OFF" THEIR DVD PLAYERS

Method	Telephone survey (2001) (n=66)
Turned off with remote	45%
Turned off at the unit	37%
Unplugged/switched off at the wall	18%
Total	100%

Note: n is total sample size in survey

KNOWN STANDBY DATA FOR NEW PRODUCTS

The NAEEEC commissioned store surveys of products conducted in major retail stores during 2001, 2002 and 2003 collected measurements from 111 DVD players over the 3 years: 28 in 2001, 44 in 2002 and 39 DVD players in 2003. The new DVD players on display were measured in active standby, passive standby and off modes (where present).

The store surveys found that the power consumption by DVD players in passive standby varied dramatically from well below 1 Watt to just over 15W. Encouragingly, the results from the 2002 and 2003 surveys indicate that there has been significant improvement in both passive and active standby power consumption in the market since 2001, with an increasing number of units at the lower end of the spectrum. While models consuming less than 1W are still the minority, the results indicate a rise in the share of products consuming less than 1W, from 12% in 2001 to 21% in 2002 to 33% in 2003. Additionally in 2001, 54% of the models tested consumed less than 3W in passive standby; in 2002 this had improved to 75% of units while in 2003 it had improved again to 93% of units. Given these results, it would be reasonable to assume that the 1 Watt target could be met within a short time frame by the majority of products.

The 2001 store survey found that over half (57%) of the DVD players had an off mode; while results from the 2002 found off mode present in 36% of units. In 2003, off mode was present in only 13% of units.

When a DVD player has an off mode, many units have no measurable power consumption in this mode (50% in 2001, 75% in 2002 and 75% in 2003). The 2001 survey found that 31% of DVD players with an off mode consumed more than 1W in this mode; however all models tested in 2002 and 2003 consumed less than 1W in off mode.

Active standby results again showed a huge variation, with the minimum power consumption recorded being 7.4W in 2001, 7.2W in 2002, 6.9W in 2003 and the maximum being 44.6W in 2001 and 52.6W in 2002. In 2003, the store survey found that the maximum active standby recorded was 16.6W which indicates a very positive improvement in active standby power consumption. While most DVD players in active standby consume between 10W and 20W the results from the store surveys show lower energy consumption in active mode is achievable with 27% of units tested using less than 10W in 2002 and 54% using less than 10W in 2003. Table 5 below summarises the results for the 2001, 2002 and 2003 NAEEEC store surveys.

Figure 1, Figure 2 and Figure 3 below show the distribution of measurements taken in the 2001, 2002 and 2003 store surveys for passive standby, active standby and off. Figure 1 shows that a greater proportion of DVD players consume less than 3W in 2003 compared to previous years.

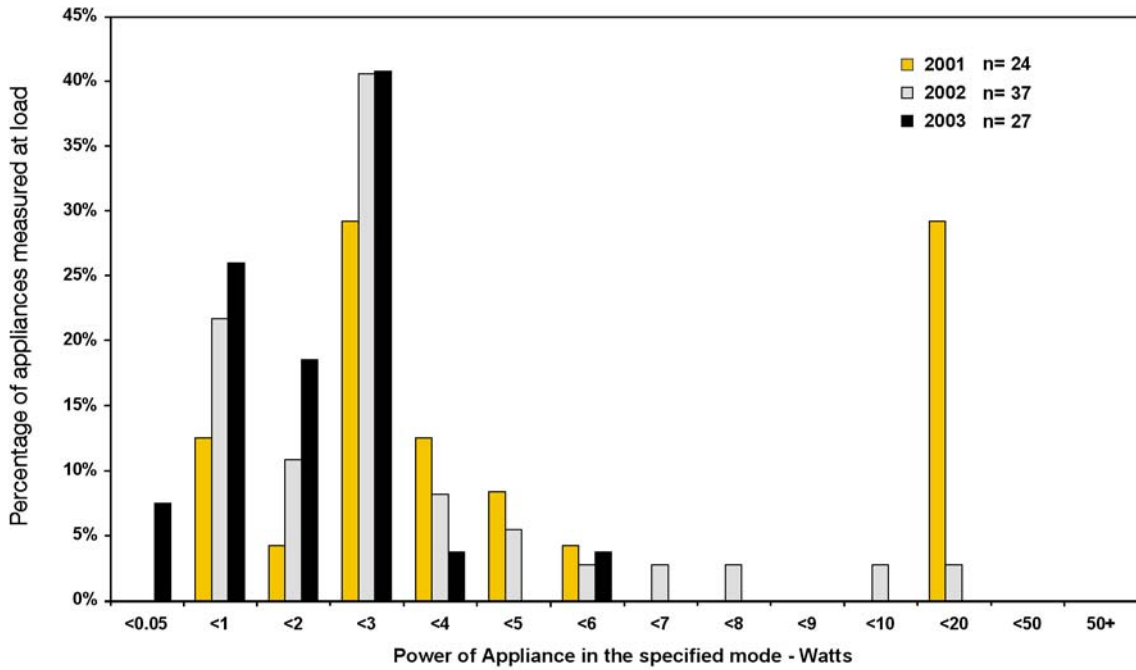
Figure 2 shows how power consumption between 10W and 20W has declined since 2001 and how the distribution has shifted into categories less than 10W.

TABLE 5: SUMMARY OF RESULTS FOR 2001, 2002 AND 2003 NAEEEC STORE SURVEYS

	2001 (n=30)	2002 (n=44)	2003 (n=39)
Average Active Standby	14.9W	13.0W	9.9W
Minimum Active Standby	7.4W	7.2W	6.9W
Maximum Active Standby	44.6W	52.6W	16.6W
Average Passive Standby	5.8W	3.0W	1.7W
Minimum Passive Standby	0.6W	0.3W	0.0W
Maximum Passive Standby	15.3W	15.2W	5.7W
Average Off	0.8W	0.1W	0.1W

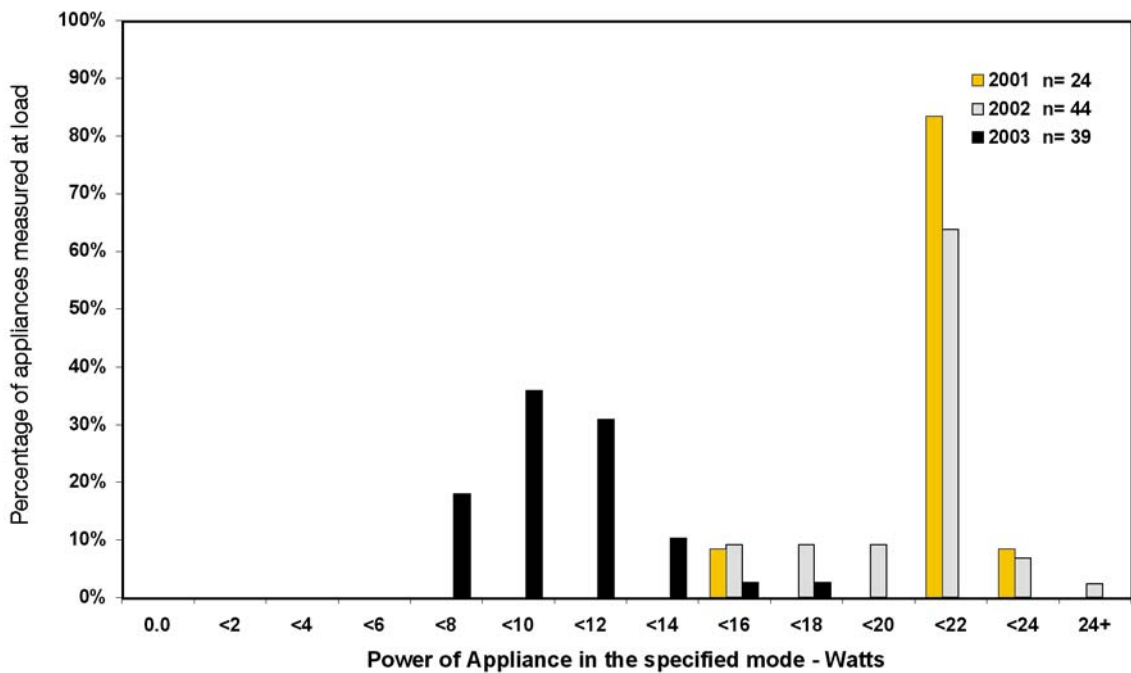
Note: n is total sample size in survey

FIGURE 1: DISTRIBUTION OF PASSIVE STANDBY POWER CONSUMPTION - DVD PLAYERS 2001, 2002 & 2003



Note: n in this figure is the total number of readings in that mode available by year.

FIGURE 2: DISTRIBUTION OF ACTIVE STANDBY POWER CONSUMPTION - DVD PLAYERS 2001, 2002 & 2003



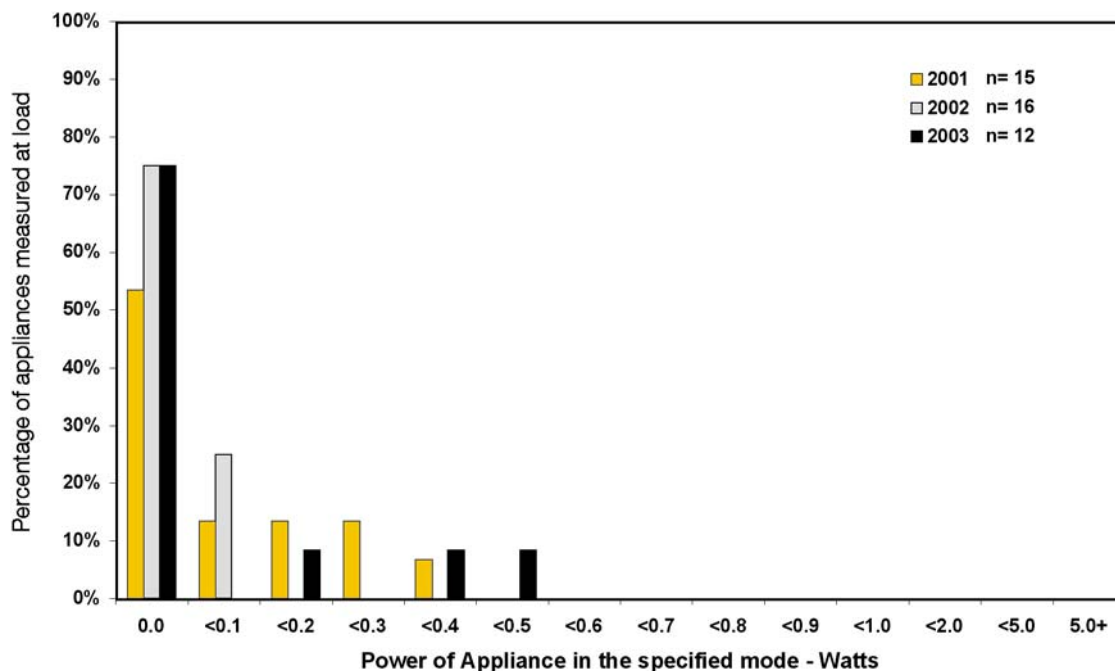
Note: n in this figure is the total number of readings in that mode available by year.

Figure 3 below shows that off mode consumption for DVD players.

In the 2003 store survey one DVD recorder and six DVD/VCRs were measured. The DVD recorder measured 25W in active standby and 9.1W in passive standby. The unit did not have an on/off switch. The

average consumption for the DVD/VCR units was 17.3W in active standby and 4.3W in passive standby. The results were similar across units with the range being 15.5W to 19W in active mode and 3.4W to 4.8 W in passive mode. However, five of the six models tested were the same brand. None of the DVD/VCR players had an on/off switch.

FIGURE 3: DISTRIBUTION OF OFF POWER CONSUMPTION - DVD PLAYERS 2001, 2002 & 2003



Note: n in this figure is the total number of readings in that mode available by year.

KNOWN STANDBY DATA FOR INSTALLED STOCK

As DVD players are relatively new to the Australian market, the level of installed stock at the time the NAEDEC commissioned household standby survey was conducted (November 2000) was low: only 8 units in 64 households were found. All models were purchased less than two years earlier. Half of the DVD players had an off mode with consumption in this mode ranging from 0 to 1.8W. The household survey also recorded passive standby ranging from 3.1W to 13.1W. While the sample numbers are too small to draw conclusions, these results appear to be consistent with the store surveys for new products. No DVD recorders or DVD/VCR players were found.

GREENHOUSE EMISSIONS

For the purposes of estimating greenhouse emissions, it has been assumed that DVDs are used for 100 hours per year and 80% of the remaining time is spent in passive standby mode with 20% of the remaining time spent in off mode (this also takes into account that only a limited number of DVDs have an off mode).

The GHG emissions reductions potential for the proposed standby target of 1 Watt for passive standby and 0.3W for off is in the order of 42 kt CO₂-e pa by 2012 and 51 kt CO₂-e pa by 2020.

To examine the potential for greenhouse savings, one scenario was modelled based on a standby power target of 1W for passive standby mode applying to 80% of the market in 2005 and 0.3 W for off mode applying to 80% of the market in 2005. Figure 4 shows the potential GHG emissions reduction. The projected sales of DVDs are expected to continue to rise rapidly until the mid 2000's, where it is projected that DVD sales will level out at approximately 1.4M units annually.

The projected effect on total energy consumption used annually by these DVDs based on the implementation of these targets in Australia is shown in Figure 5.

FIGURE 4: BAU VS POLICY TARGET GHG EMISSIONS FOR DVDS

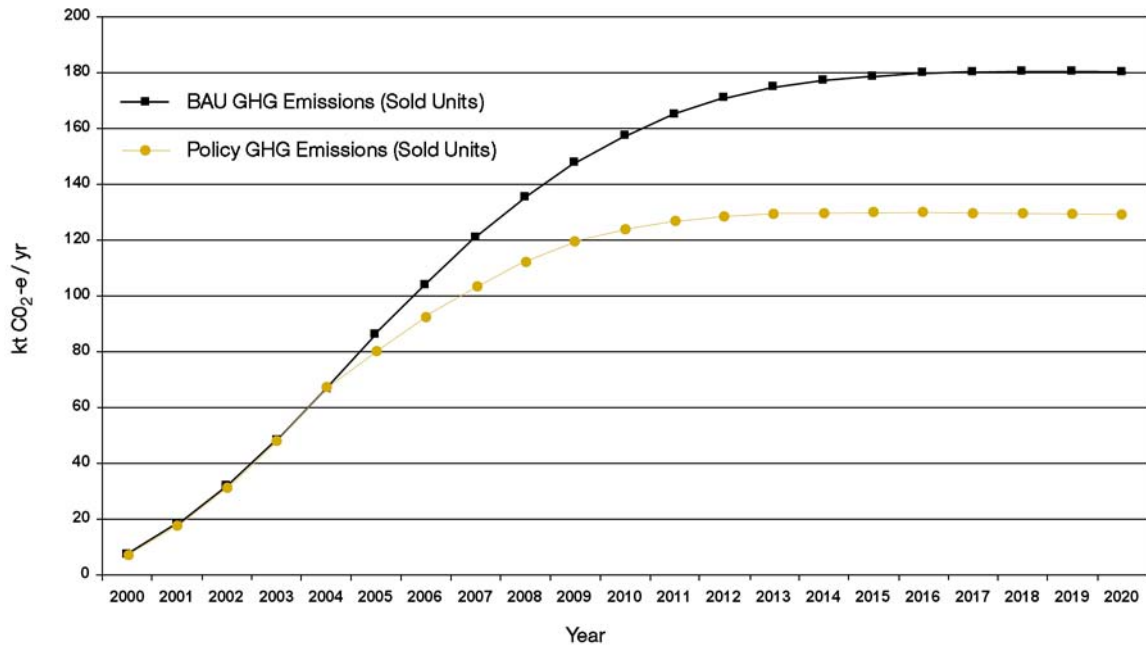
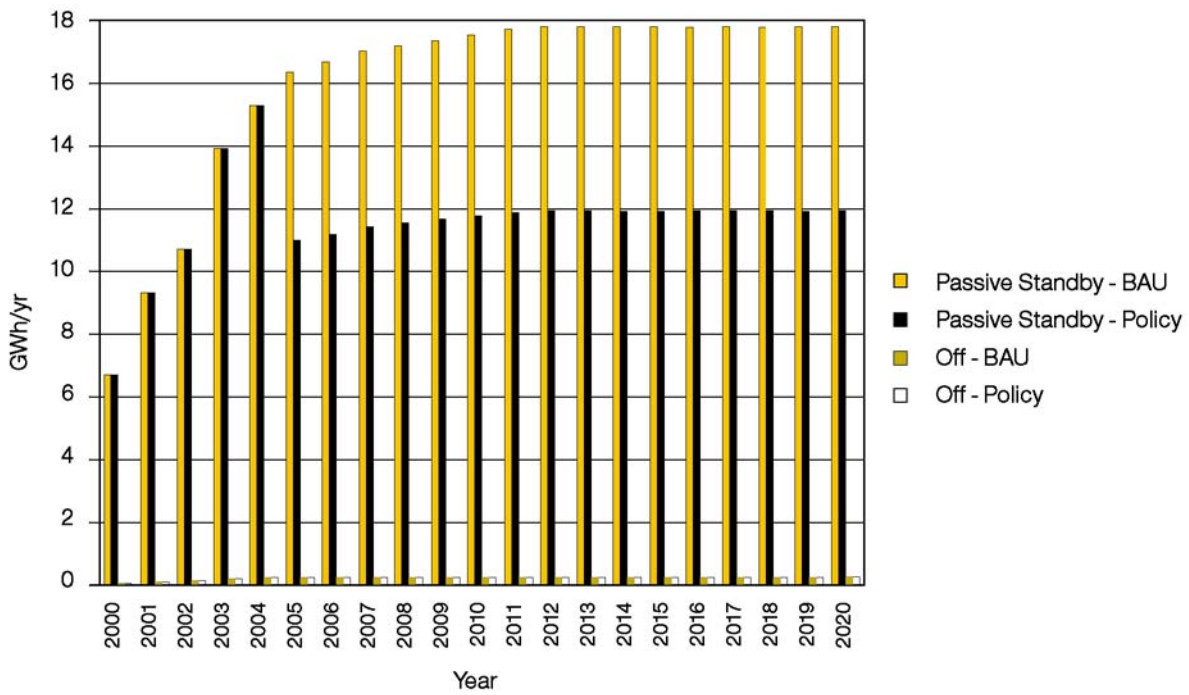


FIGURE 5: BAU VS POLICY TARGETS FOR ENERGY CONSUMPTION OF ALL DVDS SOLD



USA AND INTERNATIONAL

In the US and internationally, the ENERGY STAR Program run by the US Environmental Protection Agency (US EPA) aims to encourage industry best practice by forming partnerships with manufacturers and setting performance targets for appliances. The ENERGY STAR program is a voluntary program and is being implemented in two phases. Phase I concluded on 31 December 2002 while Phase II commenced on 1 January 2003. The Phase II criterion was reduced to be less than or equal to 1W. Specifications for Phase II applies to products that manufacturers begin to ship after 31 December 2002. More details can be found on www.energystar.gov and www.energystar.gov.au.

EUROPE

The Group for Energy Efficient Appliances (GEEA), which is made up of representatives from a number of European national energy agencies and government departments, encourages industry best practice through a voluntary energy labelling scheme which covers a wide range of home electronics products and office equipment. The criteria for each product are generally reviewed (although not necessarily altered) on an annual basis. As at January 2003, to be eligible for a GEEA label DVD players must use no more than 1 Watt in passive standby mode. In addition, it requires that DVD players to have an off mode and to use no more than 0.5W when in off mode. The factory default setting must automatically switch to a low power mode of less than 1W (nominally standby-passive mode) after 30 minutes of inactivity (eg disc ending or empty). Revised criteria are being introduced on 1 January 2004, with the main change being the inclusion of a maximum power of 11W in on mode.

For DVD recorders and DVD/VCR players the 2003 criteria requires units to consume less than 3W in passive standby. From 2004 these appliances will have to consume less than 2.5W in passive standby and less than 15W in on mode to be eligible for a GEEA label. More details can be found on www.gealabel.org/home.htm.

The Nordic Swan program is a voluntary eco label system used across five northern European countries. It launched eligibility criteria for DVD players in 2003. The requirements include a passive standby target of less than 2W and an on mode target less than 15W. For more details see www.svanen.nu.

INTERNATIONAL INITIATIVES

The International Energy Agency (IEA) has been promoting the "One Watt Initiative" energy saving program to cut world-wide electricity losses from appliances in standby. Launched in 1999, this campaign aims to guide government policy-makers and appliance manufacturers towards equipment that consumes no more than 1W when in standby mode. The Australian Government has endorsed the One Watt standby target for appliances sold in Australia. More details can be found in Ministerial Council on Energy standby strategy "Money isn't all you're saving" (MCE 2002). Table 6 provides a summary of the international programs that address standby power for DVD equipment.

TABLE 6: SUMMARY OF PROGRAM REQUIREMENTS FOR DVD EQUIPMENT INTERNATIONALLY

	Mode	Dates	Criteria
DVD Players			
Energy Star	Passive standby	Phase I: until 31/12/2002	≤3W
	Passive standby	Phase II: from 1/01/2003	≤1W
GEEA, Europe	Off (must have off mode)	Until 31/12/2003	≤0.5W
		From 1/01/2004	≤0.5W
	Passive standby	Until 31/12/2003	≤1W
		From 1/01/2004	≤1W
	On	Until 31/12/2003	No requirement
		From 1/01/2004	≤11W
Nordic Swan	Passive standby	From 19/3/2003	2W
	On	From 19/3/2003	15W
DVD Recorders and DVD/VCR Players			
GEEA, Europe	Passive standby	Until 31/12/2003	≤3W
		From 1/01/2004	≤2.5W
	On	Until 31/12/2003	No requirement
		From 1/01/2004	≤15W
Energy Star	Passive standby	Phase I: until 31/12/2002	≤3W
	Passive standby	Phase II: from 1/01/2003	≤1W

Note: GEEA criteria are reviewed annually.

GOVERNMENT TARGET

In accordance with the National Standby Strategy, NAEEEC intends to recommend to the Ministerial Council on Energy an 'interim' target. The purpose of which is to provide governments with confidence that Australian products will meet the ultimate target, of one watt in 2012. If the 'interim' target is not met in the specified year, government will commence dialogue with industry to explore other options, including the possibility of moving to Stage 2 mandatory measures.

1. INTERIM TARGET - 2006

Product	Off mode power ¹⁾	Passive standby mode power ²⁾	Power down time ³⁾
DVD players, DVD recorders and DVD/VCRs	Less than 1 Watt	Less than 4 Watts	30 minutes

Notes:

1. *Lowest power when connected to the mains. Limit is applicable to models which have an off mode*
2. *When switched off using a remote control, where applicable.*
3. *Required to power down to passive standby after a nominated period of inactivity*

This target applies to all DVD players, DVD recorders and DVD/VCRs brought into Australia for sale in that year.

NAEEEC proposes to monitor the sale of DVD players, DVD recorders and DVD/VCRs in that year and to move toward regulation should that target not be met by a significant number of suppliers of products. In addition, all DVD players, DVD recorders and DVD/VCRs will be required to "power down" to passive standby after a period of **thirty** minutes.

2. NATIONAL STANDBY STRATEGY TARGET - 2012

Product	Off mode power ¹⁾	Passive standby mode power ²⁾	Power down time ³⁾
DVD players, DVD recorders and DVD/VCRs	Less than 0.3 Watt	Less than 1.0 Watt	10 minutes

Notes:

1. *Lowest power when connected to the mains. Limit is applicable to models which have an off mode*
2. *When switched off using a remote control, where applicable.*
3. *Required to power down to passive standby after a nominated period of inactivity*

The National Standby Strategy sets out the target of one watt, to be achieved by 2012. This is consistent with international activities, in particular, the IEA "One Watt Initiative" and the current Energy Star requirements. This target should apply to all DVD players, DVD recorders and DVD/VCRs. In addition, all DVD players, DVD recorders and DVD/VCRs will be required to "power down" to passive standby after a period of **ten** minutes.

The above requirements will be inserted into the relevant Australian Standard.

GOVERNMENT PROPOSALS TO ACHIEVE THIS TARGET

Government agencies intend to take the following actions to assist industry meet the standby targets for DVD players, DVD recorders and DVD/VCRs:

Voluntary Tool Available	Use for this Product	Rationale	Date
Energy Star	✓	<ul style="list-style-type: none"> This Program will continue to be supported and communicated to stakeholders, particularly emphasising the value of investing in Energy Star compliant DVDs. 	ongoing
		<ul style="list-style-type: none"> NAEEEC will set voluntary targets for the market share of DVDs that are Energy Star compliant. 	2nd Q - 2004
		<ul style="list-style-type: none"> MCE will consider creating Government Policy of purchasing Energy Star DVDs where available and fit for purpose. This policy will encourage manufacturers to supply Government agencies with DVDs that are Energy Star compliant. 	4th Q - 2003
		<ul style="list-style-type: none"> Publish Energy Star Partner compliant DVD data on www.energystar.gov.au 	1stQ - 2004
Industry Code of Conduct	✗	<ul style="list-style-type: none"> Not considered appropriate at this stage 	NA
Australian Standard	✓	<ul style="list-style-type: none"> To communicate government expectations consistent with Energy Star levels in a new Australian Standard, likely to be a part of AS/NZS 62301 	Initiate 3rd Q - 2003
Annual in-store survey	✓	<ul style="list-style-type: none"> To collect data on all modes for new DVDs and to analyse trends 	ongoing
Publish Statistics	✓	<ul style="list-style-type: none"> NAEEEC will highlight the range of performances of DVDs in the marketplace through publishing data on a website or other means. 	ongoing
		<ul style="list-style-type: none"> NAEEEC will also consider highlighting manufacturers who are not Energy Star partners 	2nd Q - 2004

Government will announce whether this product should be targeted for stage two intervention under the National Standby Power Strategy (involving possible regulatory intervention) or whether the abovementioned actions together with industry intervention have been successful in meeting the target at the NAEEEC Forum in the year:

2007

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