Home entertainment and office equipment

Home entertainment and home office equipment accounts for a substantial and increasing portion of household energy consumption and greenhouse gas emissions. These equipment types include devices that have fundamentally shaped our way of life, and are present in some form in every Australian home. As time goes by, they are converging in design and function, blurring the lines between the lounge room and the study.

Projected average home energy use in 2012 — actual energy use varies from state to state (particularly with climate) and from home to home depending on the equipment in the home and how it is used.

<table>
<thead>
<tr>
<th>Household energy use</th>
<th>%</th>
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<tbody>
<tr>
<td>Heating and cooling</td>
<td>40</td>
</tr>
<tr>
<td>Water heating</td>
<td>21</td>
</tr>
<tr>
<td><strong>Appliances and equipment including refrigeration and cooking</strong></td>
<td><strong>33</strong></td>
</tr>
<tr>
<td>Lighting</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appliances and equipment energy use data</th>
<th>% (of the 33% above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fridge freezer</td>
<td>18</td>
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<tr>
<td>Cooking</td>
<td>15</td>
</tr>
<tr>
<td>TV</td>
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<td>Home entertainment</td>
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<td>Home office</td>
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<td>Pool and spa</td>
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<tr>
<td>Stand-by</td>
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<tr>
<td>Microwave</td>
<td>2</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>2</td>
</tr>
<tr>
<td>Clothes dryer</td>
<td>2</td>
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<tr>
<td>Clothes washer</td>
<td>2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: DEWHA 2008

Decisions you make about the purchase and use of this equipment in the coming years will impact significantly on your overall energy use.

General guidelines

- Don’t buy equipment you don’t really need. ‘Do I really need this?’ — make this the first question you ask when thinking about buying home entertainment or home office equipment.
- If you do need it, choose a device that is the right size for your needs. Make the retailer consider the right sized appliance for your needs.
- Seek advice from consumer groups, such as Choice, which publishes a monthly magazine and website (www.choice.com.au) with information for consumers. Choice conducts field trials on appliances and equipment, and reports on its findings with recommendations on the best products to purchase.
- Choose a device that suits your needs.
Energy Rating Label and Energy Star

Energy Rating Label

The Energy Rating Labelling Scheme is mandatory for many appliances. Currently TVs are the only home entertainment or home office product covered by the scheme. Since 2009, labelling has been mandatory for all TVs sold in Australia, providing consumers with easily understood information about how much energy a unit uses over a year.

Energy rating labels show how efficient a TV is and how much energy it uses in a year.
When considering the purchase of a TV, compare the energy rating of models with the same screen size and technology; for example, the star rating cannot be used to compare a 69cm plasma TV with a 102cm LCD TV. The higher the number of stars on the label, the more efficient the product, and the lower its energy consumption. The label also shows the estimated annual electricity usage in kWh per year – use this number to help choose a TV by considering total energy usage.

**Energy Star**

Energy Star is an international voluntary labelling program designed to identify and promote energy efficient electronic equipment. First created in the US by the Environmental Protection Agency in 1992, it is now used by many countries around the world and is seen on products sold in Australia.

Products marked with the Energy Star logo are among the best in their class. They have met stringent energy standards for a number of their different operating modes (e.g. energy use when on, energy use when in stand-by mode).

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**Stand-by power**

Stand-by is the power used by equipment when it isn’t performing its primary task. A classic example is a TV turned off using a remote, still using power while waiting for the next remote signal.

Studies have found that stand-by energy usage accounts for up to 10% of the annual household electricity bill (Energy Efficient Strategies 2011). Although every type of appliance found in a house can contribute, the two largest areas of stand-by use are in home entertainment and home office equipment. Together they account for over 60% of the total stand-by use of a house (Energy Efficient Strategies 2011) — that could be 6% of your annual electricity bill!

![Stand-by power consumption chart](chart.png)

Source: Energy Efficient Strategies 2011

Comparative contribution to stand-by power use from appliance groups.

Almost all home entertainment and home office equipment products use some stand-by power. Without turning them off at the power outlet (or by using a stand-by power controller (see 'Stand-by power controllers' below), it is almost impossible to reduce this use.

*Almost all home entertainment and home office equipment products use some stand-by power.*
The two tables summarise results from a study into residential stand-by in Australia in 2010, for home entertainment equipment and for home office equipment (www.energyrating.gov.au). The average power drawn in stand-by mode (apart from the set-top box and modem which are given for on mode) is used to estimate the cost in a year, assuming the product is left in the same mode for a whole year, using electricity costing $0.2855/kWh.

### Stand-by power controllers

Stand-by power controllers can easily reduce stand-by power consumption. These powerboards automatically control the power usage of the devices plugged into them. They are becoming more common as their design has become more user friendly, and higher electricity costs and awareness has increased consumer demand. These controllers are a useful tool for householders to limit their stand-by consumption without the physical effort of bending down and turning off power points.

**Stand-by power controllers can easily reduce stand-by power consumption.**

How do they work? The two main styles of controller may also be combined in some models:

- **Master and slave** arrangement (most commonly used for home office equipment) — when the master device (usually desktop computer) is shut down, any device plugged into a slave socket on the board (e.g. printer) automatically has its power supply cut off.

- **Remote control sensor** system (most commonly used for home entertainment equipment) — the stand-by board constantly searches for a signal from your remote controller (usually TV, although it works for any remote signal) and if it doesn’t find any for a period of time, it shuts down all devices plugged into the board (e.g. DVD player).

Stand-by power controllers usually include an ‘always on’ socket, for equipment that householders don’t want to be controlled (e.g. for recording or required programming updates).

### Networking products

Equipment that either ‘makes’ a network or is capable of joining a network — called ‘networking products’ — is becoming more and more common in homes, as connection to the internet increases and more wirelessly operating devices are in use. Generally, networking products are associated with a computer (desktop or laptop), although with tablets, smart phones,
and internet connected home entertainment devices, this is not always true.

Networking products constantly use power, whether the network is being used or not, for product design reasons and for user convenience (the network is always at call).

Networking products in a home office (and used by home entertainment equipment) are usually:

- modems
- routers
- switches
- media hubs
- VOIP (voice over internet protocol) equipment.

These products can be purchased with multiple functions (e.g. a modem and a router in one) and many have some kind of wireless capability.

For householders, the choice comes down to saving electricity by turning the networking appliance off at the power outlet (the devices usually don't have switches) or leaving them on to allow network and wireless network connection and use. If you don't need the convenience of constant network connection, consider turning off the power to these products when not needed.

### Home entertainment equipment

Home entertainment equipment includes devices like TVs, DVD players, games consoles and set-top boxes. It is a rapidly changing appliance sector, which in recent times has seen massive shifts in technologies — VCRs to DVD players and CRT (cathode ray tube) to LCD TVs are key examples.

#### Televisions

Televisions are of particular importance because the average Australian house owns at least two units, and they are central to a range of peripheral devices. How you use your TV also governs how a number of other appliances are used.

Large screen sized TVs use a significant amount of power: some large plasma screen types can consume more electricity over a year than an average sized refrigerator. It pays to choose a unit that gives viewing pleasure and is efficient.

The massive change in TV technology over the past five years has seen the general phasing out of CRT screen types (‘old style’ sets) and the phasing in of LCD and LCD/LED types. This change has brought a corresponding increase in screen size across all technology types. Constant design changes and improvements have had, and will have, a significant and changing impact on power consumption.

In general, for a particular screen type, the larger the screen area, the higher the power consumption, but this rule does not always hold true when the design and age of the TV is considered. Some simple tools can help in your choice of TV, in particular the Energy Rating Label scheme.

### Hints for purchasing and using home entertainment equipment

- Aim to purchase equipment that has an Energy Star logo.
- In general, try to limit the number of individual home entertainment devices you own and use. A single device combining functions (e.g. DVD player/hard disk recorder) helps reduce purchase and ongoing costs, and avoid the power lead tangle.
- Purchase and install a stand-by power controller for your home entertainment equipment, which automatically turns off all connected devices when the TV is turned off. Alternatively, use a remote switch device to turn off the entire entertainment system.
- If you don’t use a stand-by power controller, purchase products with an on/off switch, and make it a habit to use this switch in your daily routine. Some devices do not feature on/off switches.
- If you are not using a device for an extended period of time, save money and power by turning it off at the power outlet.

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Energy
Home entertainment and office equipment

AV receivers/amplifiers
Be sure to turn the amplifier off when not in use or when your favourite program or album has finished.

DVD players

Standard DVD and Blu-ray players have similar stand-by power consumption.

Although there are differences in the picture quality of Blu-ray and normal DVDs, the in-use and stand-by power consumption of players is very similar.

Games consoles
Consider whether you need to have the console connected to the internet, which can draw more power even when not in use, or consider connecting only when required. Make the same consideration for peripheral devices (motion capture, sensor boards), which can cause consoles to use more power if connected, even when not in use.

Portable media player docking stations
Purchase a docking station that meets multiple needs (i.e. alarm clock, radio, speakers). Fewer appliances mean lower power use and a better use of space.

Set-top boxes and recorders
Set-top boxes (especially pay TV types) and hard disk recorders/personal video recorders are high power users. They are also difficult to manage, as they generally need constant power connection to allow recording, program updating or memory retention.

Stereo equipment
The range of devices in this category has the same general rules as set-top boxes and recorders.

Subwoofers (powered)
Powered subwoofers have their own power plug, unlike units powered by an amplifier. Your subwoofer may have an on/off switch, which is usually located somewhere on the back.

Television

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Home office equipment
Home office equipment includes devices like desktop computers, external hard drives, printers and modems. In the rapidly changing appliance market, it is difficult to predict what the next big thing will be. Like home entertainment, this equipment is so core to our way of life, we take many of the functions it allows for granted.

Desktop computer usage
A computer does not need to be running constantly to operate effectively.
Along with a shift in ownership from desktop to laptop computers, is an increasing trend for owners to leave desktop computers running 24/7 — as a home server or network hub, or for ease of use.

The average desktop computer uses around 90W in on mode (some high performance units may use over 200W), which can easily add up to more than $150 a year in running costs.

A computer does not need to be running constantly to operate effectively. Computers and computer monitors are usually ‘power management’ enabled whereby the computer and monitor go into ‘sleep mode’ after a determined period of inactivity. Power management can be customised to suit network and individual user requirements.

**Hints for purchasing and using home office equipment**

- In general, try to limit the number of home office devices you own and use. Combine functions in a single multifunction device to help reduce both purchase and ongoing energy costs.
- Purchase and install a stand-by power controller for home office equipment, which automatically turns off devices when the computer is shut down, and saves the hassle of doing it individually!
- If you don’t use a stand-by power controller, try to purchase products with an on/off switch and make it a habit to use it in your daily routine. Some devices do not have on/off switches.
- If you are not using a device for an extended period of time, save money and energy by turning it off at the power outlet.

**LCD computer monitors**

Purchase a computer monitor with an Energy Star logo. Ensure power management is enabled. The on/off button on the front of a computer monitor (when the computer is shut down) usually just turns off the indicator LED!

Do not use screensavers: they do nothing to save the screen and use power to operate.

**Computer speakers**

Computer speakers are large stand-by power users in the home office. Speaker sets that include a subwoofer component generally use more power than those without. Usually speakers have a significant stand-by power consumption even if turned off with an on/off switch. Switch them off at the power point to save power.

**Desktop computers**

Desktop computers are a key home office appliance, as they are usually central to a range of peripheral devices. This means how you use your desktop computer governs, in some way, how a number of other appliances are used (especially if you have a stand-by power controller).

- Consider replacing your desktop computer with a laptop or nettop/slim-form computer to both increase the ease of use (you can move around with your computer), and reduce power consumption.
- When the computer is not being used, shut it down/turn it off using the on/off switch, turn it off at the power point or unplug it. Better still, use a stand-by power controller.
- Understand that leaving a computer running 24/7 significantly adds to an annual household electricity bill.
- Configure the power management of your computer and monitor to minimise the time it is left inactive using full operating power — an easy way to save on energy use.

**Portable mains powered external hard drives**

Portable mains powered external hard drives normally do not have an on/off switch, so when the hard drive isn’t in use, turn it off at the power outlet or unplug it.

**Laptop computers**

Laptop computers are capable of supporting many peripherals.
improving, and they can be easily moved around. Similar in function, although perhaps different in purpose, tablet computers, e-readers and smart phones are becoming popular and are in some cases replacing traditional laptop and desktop computers. All these devices make use of the energy efficiency that comes with being battery powered — they need to make better use of power otherwise the battery wouldn’t last. Use that to your advantage at home as well.

New battery-powered devices have to be energy efficient or the battery wouldn’t last.

When considering laptop computers:
- try to purchase one with an Energy Star logo
- turn it off at the power point or unplug it when it isn’t in use or charging.

Printers/multifunction devices
The common household printer is being replaced with multifunction devices — look for the Energy Star logo.

A multifunction device is able to perform a number of functions, such as scanning/copying, printing and faxing (becoming unusual). For high volume or frequent multi-page printing a laser printer may be cheaper to operate than a device using costly ink cartridges.

Networking products — media hubs, modems, routers, switches

Networking products are increasingly found in homes, in both home office and home entertainment areas. More devices are now capable of being connected to the internet and each other, and they still normally require devices that allow connections.

Increasingly networks in homes are becoming wireless, saving on all the cord clutter. But the devices allowing these networks need to be on all the time. The convenience of a wireless network comes with a power cost. The best hint for saving power with networking products is to purchase devices with multiple functions (e.g. a wireless modem router) and thus having fewer individual appliances.

Cordless phones
Purchase only the minimum number of handsets needed — the more stations in use, the higher the power consumption.

References and additional reading

Choice. www.choice.com.au


Author
Jack Brown, 2013