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## Get connected with sustainable IT and business devices

Business use of information technology (IT) and electronic devices has helped Australia's economic growth and delivered significant productivity improvements.

SMEs in particular have benefited from these technology improvements. They've made accounting and record keeping easier and helped us to run factories more efficiently. They've smoothed out payroll responsibilities and generally enabled better communication with customers and suppliers.

From the office desk to the shop counter, the factory floor to out on the road, digital technology has become indispensable in virtually every aspect of business.

The gains have of course come at a price – not just the price of the new devices but also the environmental impact of those products, the energy needed to run them and the end-of-life disposal.

But by giving some additional consideration to the use and implementation of their IT, SMEs can actually make environmental improvements and even get more bang for their buck.

## **Making a difference**

Reducing the environmental impact of your IT simply requires a more detailed understanding of the big environmental footprint behind the equipment, followed by an ability to communicate those details to the people who count in your business.

There are four key things to think about:

1. When buying new equipment, consider the environmental impacts of how it is manufactured, its energy requirements and the estimated length of its functioning life.
2. When using equipment, pay attention to energy efficiency by activating power-saving features and turning off machines not in use.
3. Get the most out of your investment in IT by using hardware and software to its fullest potential. This can help to streamline other business processes and operations and help to lower your overall environmental footprint.
4. Dispose of unwanted equipment responsibly by seeking out opportunities for reuse and recycling.

The environmental savings that come from paying attention to these key principles include lower use of raw materials, fewer greenhouse gas emissions, fewer hazardous by-products and less toxic waste. The business savings include:

- lower energy costs including additional savings on air-conditioning and maintenance
- longer lifespan for your equipment, reducing the capital cost of replacements
- increased productivity.

### How to save money with your computer<sup>115</sup>

A computer left on 24 hours a day, 365 days a year will cost your business approximately \$135 per annum.<sup>116</sup>

By switching off your computers at the end of a working day, you can easily reduce that usage to 10 hours per day, five days a week. If you do that then you can reduce the running cost to \$40 per year. That's a saving of \$95 per computer.

The table below gives you an indication of the potential savings for your business:

NUMBER OF COMPUTERS	POTENTIAL SAVINGS PER ANNUM
1	\$95
5	\$475
10	\$950
15	\$1425
20	\$1900

Switching off all your other machines such as photocopiers and printers will result in additional savings.

115 *Eco-efficiency for small business*. See [www.derm.qld.gov.au](http://www.derm.qld.gov.au)

116 Based on an energy tariff of \$0.155/kWh

## Purchasing

Sometimes the most business-friendly and environmentally responsible purchase is not to purchase at all. Always ask yourself whether you really need a new device. It's nice to have the latest but don't be swayed by the flashy marketing; sometimes the advertised improvements in performance don't mean much in reality. Do your research.

Consider good-quality second-hand or just-superseded equipment. Last year's top-of-the-range model from a respected brand might have more life left in it and be more efficient than the latest budget-priced offering that looks better on paper. Cheap PCs, for instance, often scrimp on components like power supplies, whereas higher quality power supplies can be far more efficient in converting incoming electricity for use.

If you're thinking about buying new equipment, consider the following tips first:

1. Explore options for upgrading existing equipment before investing in a new model. For example, getting extra RAM is likely to be cheaper than buying a new computer, so check out that option first.
2. When you do buy new equipment, invest in models that are designed to be upgraded, from manufacturers who also offer extended warranties. You should aim to get five years of service rather than the corporate standard of two or three years.
3. Consider switching over to laptops. Using a laptop computer rather than a desktop PC and monitor can reduce energy consumption by up to 80%. They also have the additional benefit of being portable, so your employees can use them when on the road or working from home.
4. In a bigger office, a network of 'thin clients' (a stripped-down PC that has low power needs) connected to a central server doing most of the processing and storage can be the most economical and efficient option. However, you should always check that the total power consumption of the thin clients combined with the servers and disk drives required to support them is lower than standard PCs.
5. If you are looking at the prospect of multiple servers, blade servers (in which many components are removed, with services such as power provided by the enclosure) will take up less space and use less power than a stack of standalone servers.

6. What goes for purchasing equipment also goes for services. Take responsibility for your environmental impact along the supply chain by choosing service providers who are committed to environmental performance. There are various internet service providers and web hosting companies that now use green energy in their operations.

Energy Star compliance reduces the amount of energy used by a product by either automatically switching it into 'sleep' mode when it's not being used and/or reducing the amount of power used when in 'standby' mode.

### **Donating your old computers to charity**

If you want to donate your old computers to charity or a local school, it's worth checking first whether they have a use for them. For example, if you drop off your computers at a charity drop off zone without checking first, the charity may end up having to pay for the disposal of your computers.

The Our Community organisation has a web page which lists charities that accept old computers for recycling or refurbishment.<sup>117</sup>

Infoxchange Australia's GreenPC initiative enables people on low incomes to access technology and seeks to reduce the environmental impact of outdated technology by prolonging its lifespan and usability. The organisation refurbishes used computers and provides them to low-income communities, individuals and community organisations.<sup>118</sup>

When donating your old computers to charities, make sure you delete sensitive company data or personal data first. Software is available that guarantees the secure deletion of such information.

117 See [www.ourcommunity.com.au](http://www.ourcommunity.com.au)

118 See [www.greenpc.com.au](http://www.greenpc.com.au)

For a comprehensive assessment of desktop computers and notebooks, check out the Electronic Product Environmental Assessment Tool (EPEAT), an international rating standard developed with funding from the US Environmental Protection Agency to help IT purchasers. EPEAT evaluates environmental performance against 23 required criteria and 28 optional criteria, including a category for energy conservation. Go to [www.epeat.net](http://www.epeat.net) for more information.

For electronics equipment other than computers, Greenpeace's Guide to Green Electronics offers an assessment of the overall environmental performance of well known brands. Go to [www.greenpeace.org](http://www.greenpeace.org) to read the guide.

Another useful resource is the Silicon Valley Toxics Coalition website at [www.svtc.org](http://www.svtc.org). It has lots of interesting information on environmental impacts, the performance of computer companies in material use and responsibility for end-of-life management.

### **Download and save**

Depending on the scope of your operations, it is probably worth buying software to measure and manage your computer's energy-saving functions. Ask your IT supplier or service consultant for advice. In the meantime, here are a few handy applications that you can try out.

### **Watch Over Energy**

For Windows 95, 98, ME, 2000, XP and NT systems, this free program manages your computer monitor's stand-by mode and helps to track your energy savings. The developers suggest it can reduce your monitor's energy costs by at least 20 per cent. Go to [www.watchoverenergy.com](http://www.watchoverenergy.com) to download a copy.

### **Shutdown Vaccine**

For PC networks, this shareware software can automate power-related tasks such as shutting down all workstations at a particular time. Go to <http://shutdown-vaccine.smartcode.com/info.html> to download a copy.

## Saving power

1. Switch computers off whenever possible. Left on day and night, every day for a year, as happens in some offices – a big energy inefficient desktop computer can use up to 850 kilowatts of electricity and generate up to 900 kg of carbon emissions.<sup>119</sup> Switching off a computer at the end of the working day can cut its electricity use to less than 250 kilowatts with comparable carbon and cost savings. Another simple way to save money is to encourage your employees to turn off their computers even when they are going to a meeting or to lunch. You can also buy far more energy-efficient computers.
2. What goes for computers goes for screens. There is no need to worry that turning it off and on will shorten its life. Even doing so five times a day will only increase the frequency of faults after 20 years (and it probably won't last that long anyway).

### Greentrac

For Windows and Mac computers, Greentrac enables businesses to automate the power management of all their computers. It can shutdown, hibernate or put computers into standby mode. It also gives real-time energy feedback to employees in a way that encourages them to take personal responsibility for reducing their computer's energy waste. The company behind Greentrac is an Australian SME and they state that users of its software typically reduce PC energy consumption by 50–65 per cent. Go to [www.greentrac.com](http://www.greentrac.com) for more information.

### EZ Wizard

For Windows 2000 and Windows XP systems, this free application provides a simple point and click interface for monitoring power management. Go to [www.energystar.gov](http://www.energystar.gov) to download a copy.

### Sleep Monitor for Mac

This one isn't free, but you can trial it for 30 days. It charts a Mac's power use, showing how long it has been in use, asleep and switched off. Go to [www.dssw.co.uk/sleepmonitor](http://www.dssw.co.uk/sleepmonitor) to download a copy.

119 'Computers' energy costs', *Choice Magazine*, May 2008. Based on NSW energy emissions using Energy Australia's energy calculator

3. Disable all screen savers. Most systems now have the option under power settings to turn the display off automatically after a nominated period of time. Turning off the display delivers significantly greater power savings than a screen saver even though the screen may look the same.
4. Power-saving features, even on Energy Star qualified computers, are not automatically activated. Go into system preferences and set them to put the screen and hard drive to sleep after 10 minutes of inactivity. Sleep mode will reduce energy consumption to as little as 5% of full power and save some screens from phosphor burn-in.
5. Some systems still never go off completely but into standby mode. To ensure they are drawing zero power, turn them off at the power point. This will maximise your financial savings.
6. Place IT equipment in locations that facilitate cost-effective cooling. The electricity used by internal cooling fans can be a significant part of total power consumption, so avoid placing gear like servers in unventilated cupboards or next to other heat-producing machines.
7. Go to the Energy Star website [www.energystar.gov.au](http://www.energystar.gov.au) for more information about standby power and detailed guides on how to enable energy-saving features on Windows, Unix and Mac systems.

### **Getting the most out of your IT systems**

There are very few businesses these days that can afford to ignore the potential gains of information and communications technology – or the potential losses from getting left behind.

Can there be an environmental upside to having to keep up with rapid advances in technology? The answer is yes. Enabling a customer to order and pay online, for instance, avoids them having to travel to your premises. Other strategies your business can start capitalising on include:

1. Virtualise your IT system. Transferring application and storage needs from individual workstations to a centralised server enables the most efficient use of overall storage capacity and processing power.

2. 'Cloud computing' is the term for extending virtualisation beyond your office by using web-based applications and services. It can be as simple as web-based email or more comprehensive, like storing all your data on a remote server. These strategies not only reduce hardware and energy needs, they also make it easy to share information between teams.
3. Virtualise your office. Once you liberate information from individual computers, why not liberate employees from their desks? Telecommuting is seen by governments overseas as a key strategy for reducing traffic congestion and travel-related carbon emissions. It can also help you reduce your need for expensive office space.
4. Although many companies no longer use faxes, those who do can have them sent directly to a PC, saving on printing and making them easier to store and forward as well.
5. Many overseas companies see the uptake of teleconferencing, web-conferencing and video-conferencing as a key strategy for reducing business-related carbon emissions from travel. It also has the benefit of significantly reducing travel costs while improving day-to-day communications with customers and stakeholders.
6. For SMEs, the advantages of video meetings are significant. While it's good to get out of the office, all that time getting to meetings and waiting for others to show up is money down the drain. Check out the federal government's e-strategy guide at [www.e-strategyguide.gov.au](http://www.e-strategyguide.gov.au) for tips on the lowest cost options. Though pitched at not-for-profit organisations, the information is equally useful for SMEs.

One Australian SME has devised software that helps you to measure and offset the carbon emission impact of your computer(s). The Little Green Genie software monitors when your computer is switched on and also takes into account the environmental impact of producing your computer.

Go to [www.zerocarboncomputing.com](http://www.zerocarboncomputing.com) for more information and to download a copy.

## Why should you properly recycle your e-waste?

Making sure your equipment only goes to proper recycling companies is important. It's vital to ensure your equipment does not end up in developing countries where it can be recycled inappropriately. The Silicon Valley Toxics Coalition breaks down the ingredients of e-waste as follows:

**Lead:** used in older monitors as well as in soldering on circuit boards. Exposure can cause brain damage, nerve damage, blood disorders, kidney damage and developmental damage to unborn babies. Acute exposure can cause vomiting, diarrhoea, convulsions, coma or death.

**Mercury:** used in flat-panel displays, LCD screens, switches and printed wiring boards as well as in some batteries. High levels of exposure through ingestion or inhalation can cause central nervous system and kidney damage.

**Polyvinyl chloride (PVC):** used in printed circuit boards and components such as connectors, plastic covers and cables. When burnt it releases highly carcinogenic dioxins. Combinations of plastics that are difficult to separate and recycle are also used in printed circuit boards and in components such as connectors, plastic covers and cables.

**Cadmium:** used in chip resistors, infrared detectors, semiconductors, older cathode ray tubes and some plastics. It concentrates in the body and can cause kidney and bone damage. It's also a known carcinogenic.

**Brominated flame retardants (BFRs):** used in plastic casings and released when electronics are dumped or incinerated. BFRs bio-accumulate in organisms and along the food chain. Minute doses of BFRs can impair attention, learning, memory and behaviour. They are also probable endocrine disruptors.

**Barium:** used in the front panel of CRT monitors to protect users from radiation. Short-term exposure can cause brain swelling, muscle weakness and damage to the heart, liver and spleen.

**Beryllium:** used on motherboards and connectors. Is a known human carcinogen (can cause cancer).

**Hexavalent chromium:** used for corrosion protection of untreated and galvanised steel plates and hardener for steel housing. It can cause DNA damage and asthmatic bronchitis.

## Disposal

Of the more than 3 million computers sold in Australia each year, business purchases account for half of these. The sad fact is that after a few years most of them are likely to end up being dumped in landfill or stockpiled. Use your purchasing power to buy the most environmentally sound option and ensure your business is not contributing to the problem.

1. Select brands from manufacturers that minimise use of toxic materials, enable component recycling and take back equipment at the end-of-life to ensure it is recycled rather than sent to landfill.
2. If you're leasing your equipment, make sure the leasing company will guarantee to take back the equipment for verifiable refurbishment or recycling.
3. If you have old machines not covered by take-back guarantees, check out [www.recyclingnearyou.com.au](http://www.recyclingnearyou.com.au) to for other recycling options in your area. It's worth visiting this site on a regular basis as legislation to bring about national recycling schemes for e-waste is currently in the pipeline.
4. For mobile phones, contact MobileMuster<sup>120</sup> or the Mobile Phone Recycling Program<sup>121</sup> to organise a workplace collection.
5. Recycle printer cartridges through Cartridges 4 Planet Ark<sup>122</sup> or you can have them refilled at locations such as Cartridge World.

## The real cost of IT

In 2008, IBM conducted a global survey of 1100 executives working in companies employing 50 to 500 people (in manufacturing, financial services, retail, health care, hospitality, IT and professional services). About one in three estimated that IT accounted for 10 to 50 per cent of their total energy costs and about one in every four – outside of professional and IT services – had no idea how much IT was adding to their energy costs.

The International Energy Agency warns that our love of electronic equipment is a major stumbling block to curbing greenhouse gas emissions and limiting the effect of global warming. Its research indicates global ICT-related energy consumption will double by about 2020 and triple by 2030 – to 1700 Terawatt hours, equivalent to the total amount of energy now used by the American and Japanese residential sector.

120 See [www.mobilemuster.com.au](http://www.mobilemuster.com.au)

121 See [www.mobilephonerecycling.com.au](http://www.mobilephonerecycling.com.au)

122 See [www.cartridges.planetark.org](http://www.cartridges.planetark.org)

## **Other environmental costs**

But that's only one aspect of the environmental problem. Research by the United Nations University in Tokyo indicates that electronic devices are very resource-intensive to manufacture.

Then there is the problem of waste. Electronic equipment becomes obsolete faster than just about anything else you can buy. Processing power doubles about every two years, and software developers quickly work out how to use that power to create even more sophisticated applications, which then become the standard, leaving older machines looking like museum pieces.

To give you an idea of how far we've come, the first digital computer, completed in 1946, cost US\$500,000, (about AU\$638,000), weighed about 25 tonnes and took up 63 square metres. Today, the equivalent computing power can be delivered in a chip smaller than your fingernail.

What we do with superseded electronic equipment is one of the biggest environmental headaches we face, because electronic equipment can contain materials that pose a hazard if they're not recycled and recovered.

### **Green IT help**

The Australian Information Industry Association has an excellent free Green IT eBook that helps businesses to develop environmentally responsible IT systems and practices. Go to [www.aiia.com.au/greenit](http://www.aiia.com.au/greenit) to download a copy.

## Case study: Queensland Government Chief Procurement Office – smart IT decisions

The Queensland Government Chief Procurement Office manages purchasing arrangements for agencies, state hospitals, state schools, government-owned corporations and statutory authorities.

According to the 2009 Green Purchasing Australia Report, it implemented a whole-of-government arrangement for desktop PCs, portable computers and servers.

As a result, the Queensland Government's fleet of desktop PCs now has lower operating costs due to the improved energy-efficiency of the machines. This delivered significant financial savings and environmental benefits to the Queensland Government.

Compared with normal computers, these energy-efficient machines cost an extra \$30–\$50 each. However, the payback period to recover this cost was only 12 months. Over the estimated three-year life of each machine, the savings from reduced energy consumption will be about \$60 per unit.

The scale of the computer order was such that the Queensland Government will save an estimated \$6 million dollars in reduced energy costs.

Environmentally, this purchase will also result in savings of approximately 2.2 million tonnes of CO<sub>2</sub> emissions per year. In addition to reviewing the energy-efficiency of these computers, the government also took into account hazardous substances, packaging and product take back.

For more information, check out the 2009 Green Purchasing Australia Report. Go to [www.ecobuy.com.au](http://www.ecobuy.com.au) to download a copy.

