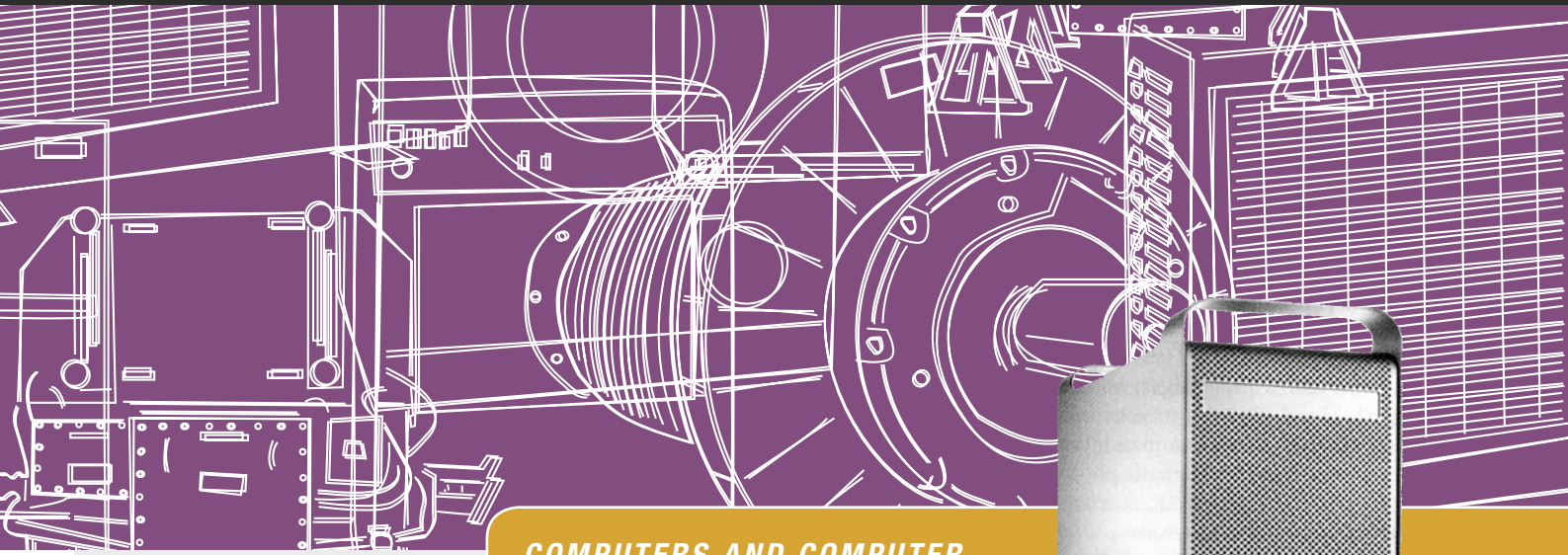
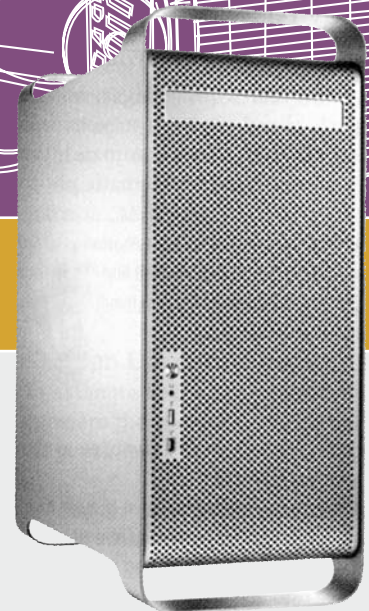


NATIONAL APPLIANCE AND EQUIPMENT ENERGY EFFICIENCY PROGRAM

Minimum Energy Performance Standards



COMPUTERS AND COMPUTER MONITORS



PREPARED FOR

THE AUSTRALIAN GREENHOUSE OFFICE UNDER
THE NATIONAL APPLIANCE & EQUIPMENT ENERGY
EFFICIENCY PROGRAM



Minimum Energy Performance Standards - Computers and Computer Monitors

The global computing industry continues to grow rapidly, developing new technologies and applications at a breathtaking rate. International interest in minimising the negative environmental impacts is substantial, for example through improving recycling and disposal practices, and through reducing energy consumption. While Australia is a small part of the world computer market, the Australian community has an opportunity to benefit from international experience to develop a considered and proactive stance for products supplied to our country.

Experts estimate that in Australia:

- Computer technologies consume approximately 8,200 GWh electricity, causing emissions in excess of 9 Mt CO₂-e in 2003;
- Desktop Personal Computers (PCs) and Cathode Ray Tube (CRT) monitors account for nearly 85% of the total energy used by computer technologies;
- 'Active' mode contributes 82% of the energy consumption of all equipment (with standby 15% and off mode 3%).

Energy efficiency regulatory agencies draw their authority to examine this issue from the National Greenhouse Strategy (NGS 1998), and the "Workplan and Policies 2002 to 2004" document (NAEEEC 2002a), which identified computers and computer peripherals for investigation. In another report outlining the regulators' approach to standby power consumption, computers and monitors are also highlighted as a priority for action (NAEEEC 2002b).

In October 2003, regulators invited key industry stakeholders to review a draft report outlining the key energy issues for computers and monitors and suggesting possible approaches. Since that date NAEEEC has been working with the United States, China and Europe to develop harmonised policies for these products.

This update provides Australian stakeholders with NAEEEC's proposed plan for measures targeted at computers and monitors, which will be more fully explained in a report to be released in 2005.

STAKEHOLDER COMMENT

NAEEEC invites comments from any interested person or organisation on the measures proposed in this study. Comments should be directed to energy.rating@greenhouse.gov.au by 31 December 2004. Information sessions for industry participants can be arranged during the comment period if requested.

Electronic copies of profiles and full reports released for public discussion can be obtained from www.energyrating.gov.au

MARKET ISSUES

The total stock of PCs in Australia is estimated to be nearly 14 million in 2003, and 86% of these are desktop computers. However, sales growth for desktop PCs has slowed (after peaking in the 1990s) and there is an increasing consumer preference for mobile technologies, with laptop sales up by 40% in 2003 from the year before.

The sales growth for monitors has also fallen since the 90s, as is to be expected with sales moving away from desktops with external screens towards mobile computers with inbuilt screens. The estimated total stock of monitors in 2003 is just over 12 million units. While approximately 94% of these stocks are CRT monitors, there is a strong sales trend towards LCD (Liquid Crystal Display) screens. The market share of LCD monitors has increased from under 10% in 2001 to almost 30% in 2003, and it is highly likely that sales of these flat screen monitors will continue to grow.

The speed of such market changes is an important factor for NAEEEC to consider, as is the development of convergent technologies, such as TVs and computer monitors. Although it is difficult to predict future technologies and

markets, NAEEEC does not want to impede technology development, while at the same time still limiting energy consumption and providing a marketing incentive to the best performing products.

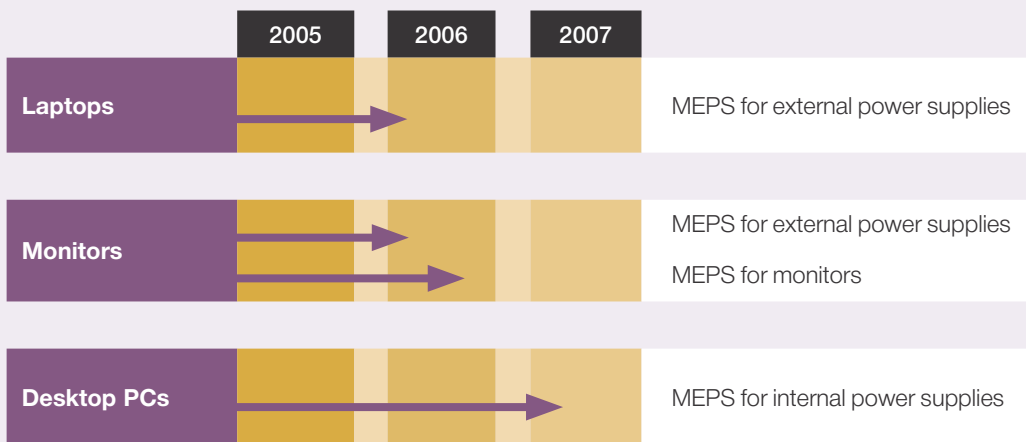
NAEEEC'S APPROACH

The key elements to NAEEEC's approach include:

- a focus on Monitors, Desktop Personal Computers and Laptops, although further measures for Workstations and Servers may be developed at a later stage;
- the use of measures to cover all modes of operation: potentially ranging through off, passive standby, active standby and on;
- a high degree of harmonisation with major trading partners.

A summary of measures proposed is shown in Figure 1.

FIGURE 1: SUMMARY OF NAEEEC PROGRAMS FOR COMPUTERS AND MONITORS



PERSONAL COMPUTERS AND MONITORS WITH EXTERNAL POWER SUPPLIES

By March 2005, NAEEEEC proposes to publish a new joint Australian/New Zealand Standard for External Power Supplies, which establishes minimum energy performance standards (MEPS) and a 'high efficiency' category of products. This will apply to all external power supplies up to 250 watts output sold in Australia, including those for laptops and some monitors.

It is intended that regulations will come into force in April 2006 after consultation with industry and other stakeholders. NAEEEEC has proposed the MEPS levels, shown in Table 1.

These levels are based on tests of over 600 products on the Australian market and have been developed in conjunction with China and the United States. The proposed Australian MEPS levels match the US Energy Star requirements to be introduced in 2004. The Australian 'high efficiency' levels have not been announced yet, however it is proposed that they should match the levels to be mandated by California in 2008.

TABLE 1: MEPS REQUIREMENTS FOR NO-LOAD AND ACTIVE MODE

Mode	Nameplate output power (P_{no})	Power Consumption
No-Load	0 to <10 watts	≤ 0.5 watts
	10 to < 250 watts	≤ 0.75 watts
		Average Efficiency
Active	0 to <1 watts	$\geq 0.49 * P_{no}$
	>1 to ≤ 49 watts	$\geq [0.09 * \ln (P_{no})] + 0.49$
	> 49 watts	≥ 0.84

Where: P_{no} is the nameplate output power of the UUT.

"Ln" refers to the natural logarithm (base e). The algebraic order of operations requires that the natural logarithm calculation be performed first and then multiplied by 0.088, with the resulting output added to 0.44.

MONITORS

The efficiency of some monitors will be improved by the introduction of MEPS on external power supplies. For computer monitors with an internal power supply, NAEEEC intends to follow the lead of the United States' Energy Star program. US EPA has released criteria effective from January 1 2005 covering off, standby and active modes, with a further ramp up after one year.

NAEEEC proposes to create a new Australian/New Zealand Standard based on the Energy Star test method and to introduce MEPS for computer monitors equivalent to Tier 1, with effect from April 2006. The Tier 2 level would be used to define 'high efficiency' models in Australia. At a date to be determined, probably in April 2008, this Tier 2 level will be adopted as the criteria for a revised, more stringent Australian MEPS level. These proposed requirements are shown in Table 2 below.

TABLE 3: ENERGY STAR CRITERIA FOR MONITORS

	April 2006	April 2008
Max active power consumption (Y)	$Y = (38X + 30)$ watts	Where $X < 1$: $Y = 23$ watts
		Where $X > 1$: $Y = 28X$ watts
Sleep Mode	≤ 4 watts	≤ 2 watts
Off Mode	≤ 2 watts	≤ 1 watt

Where: X is the number of megapixels in decimal form (e.g., 1,920,000 pixels = 1.92 megapixels).



PERSONAL COMPUTERS WITH INTERNAL POWER SUPPLIES:

As at October 2004, NAEEEEC is not able to propose MEPS levels for this type of product. In August 2004, the US EPA announced a review of Energy Star criteria for computers. NAEEEEC will continue to work with the EPA to harmonise Australian policies with those in the US and of other international Energy Star Partners.

The EPA has indicated that future criteria for PCs are likely to concentrate on improving the efficiency of internal power supplies. Because of the wide range of hardware and software configurations available in PCs, NAEEEEC has agreed to support this international approach and delay announcing MEPS levels for these products until the international community is ready to develop common standards.

It should be noted that NAEEEEC has already been working with the US and China on a new test method for internal power supplies which is in its final stages of development. NAEEEEC has also undertaken tests of Australian internal computer power supplies to contribute information to the international community.

While NAEEEEC will make a final proposal in 2005 following the conclusion of the Energy Star review, the current position is:

- NAEEEEC will develop a new Australian/ New Zealand Standard based on the test method that has been developed and trialed in several countries;
- Part 2 of this standard will contain MEPS requirements for power consumption at no-load and efficiency in active mode, to be effective at a date to be agreed, probably during 2007;
- The mandatory levels adopted in Australia may be less stringent than the initial Energy Star criteria, however a 'high efficiency' category may be defined which is equivalent to Energy Star;
- The Standard is also likely to require that all PCs are to be shipped with standby enabled (where these features are loaded) and minimum default times set (equivalent to current Energy Star requirements).

IMPACT OF MEPS

It is estimated that the adoption of the proposed measures should reduce annual energy consumption considerably, leading to a consequent reduction in emissions of CO₂e. Total estimated cumulative savings will be published at a later date.

REFERENCES

NAEEEP 2002a, National Appliance & Equipment Energy Efficiency Program. Work plan and policies 2002-2004. Commonwealth of Australia. April 2002

NAEEEP 2002b, Money Isn't All You Are Saving - Australia's Standby Power Strategy 2002-2012. Commonwealth of Australia. November 2002

NAEEEC MEMBERS

The Commonwealth, New Zealand, and all State and Territory governments are part of NAEEEC. Representatives are senior officials from various government agencies and statutory authorities or persons appointed to represent those bodies.

The *Australian Greenhouse Office (AGO)* is the Australian Government agency responsible for monitoring the National Greenhouse Strategy in cooperation with State and Territory Governments and with the support of local government, industry and the community. The AGO chairs NAEEEC and other members provide support for its activities.

The NSW *Ministry of Energy and Utilities* (incorporated within the Department of Energy, Utilities and Sustainability since 1 January 2004) provides policy advice to the NSW Government and operates a regulatory framework aimed at facilitating environmentally responsible appliance and equipment energy use. The Ministry is represented on the Energy Efficiency and Greenhouse Working Group, through which the appliance and equipment related elements of the National Greenhouse Strategy are being progressed.

The NSW *Sustainable Energy Development Authority* was established in February 1996 with a mission to reduce the level of greenhouse emissions in New South Wales by investing in the commercialisation and use of sustainable energy technologies.

The *Office of the Chief Electrical Inspector* is the Victorian technical regulator responsible for electrical safety and equipment efficiency. Its mission is to ensure the safety of electricity supply and use throughout the State. The corporate vision of the Office is to demonstrate national leadership in electrical safety matters and to improve the superior electrical safety record in Victoria. The Office's strategic focus is to ensure a high level of compliance is sustained by industry with equipment efficiency labelling and associated regulations.

The *Sustainable Energy Authority* was established in 2000 by the Victorian Government to provide a focus for sustainable energy in Victoria. The Authority's objective is to accelerate progress towards a sustainable energy future by bringing together the best available knowledge and expertise to stimulate innovation and provide Victorians with greater choice in how they can take action to significantly improve energy sustainability.

The *Electrical Safety Office*, Department of Industrial Relations, is the Queensland technical regulator responsible for electrical safety and appliance and equipment energy efficiency. The office ensures compliance with electrical safety and efficiency regulations throughout Queensland.

The *Department of Energy* is the lead agency with regard to sustainable development within the

Queensland energy sector and is involved in a range of activities that reflect the importance of a sustainable approach. These activities involve developing and evaluating policies and initiatives through flexible and responsible decision making that allows economic, environmental and social outcomes from the energy sector to be maximised.

The Western Australian electricity regulator *Energy Safety* (a Division of the Department of Consumer and Employment Protection) is responsible for the technical and safety regulation of the electrical industry in WA. This includes the safety of consumers' electrical installations and appliances and the auditing of appliances and equipment to check compliance with energy efficiency and prescribed safety requirements.

The Western Australian *Sustainable Energy Development Office* promotes more efficient energy use and increased use of renewable energy to help reduce greenhouse gas emissions and increase jobs in related industries.

The *Office of the Technical Regulator* seeks to ensure the coordinated development and implementation of policies and regulatory responsibilities for the safe, efficient and responsible provision and use of energy for the benefit of the South Australian community.

The Tasmanian Government's interest is managed by the Department of Infrastructure, Energy and Resources' *Office of Energy, Planning and Conservation (OEPC)*. The OEPC provides policy advice on energy related matters including energy efficiency. Its web site is www.dier.tas.gov.au/energy/index.html.

Electricity Standards and Safety is the technical regulator responsible for electrical safety throughout Tasmania. Regulatory responsibilities include electrical licensing, appliance approval and equipment energy efficiency.

The Australian Capital Territory's interest is managed by the *Energy Policy Unit, Economic Management Branch*, Department of Treasury. The primary function of this Unit is to provide the ACT Government with advice on National and Territory energy related matters including energy efficiency.

The *Department of Infrastructure, Planning and Environment* is responsible for the administration of regulations in the Northern Territory regarding various aspects of safety, performance and licensing for goods and services including electrical appliances.

The *Energy Efficiency and Conservation Authority (EECA)* is the principal body responsible for delivering New Zealand's National Energy Efficiency and Conservation Strategy (NEECS). EECA's function is to encourage, promote and support energy efficiency, energy conservation and the use of renewable energy sources.

