

Energy Newsletter

This is the first issue of the *Energy Newsletter*. This newsletter will be produced by Facilities and Services on an "ad hoc" basis (that is, when there is information worth sharing) and its purpose is to keep areas informed about range of issues, including the status of the energy contract and energy conservation initiative being undertaken by this and other Divisions.

The Division's contact for the newsletter, as well as energy contracting matters, is Bart Meehan. Bart is also the officer responsible for coordinating the implementation of the ANU Environmental Management Plan ([ANUgreen](#)), which includes a number of energy conservation objectives. Bart can be contacted on Ext 54148 or (0416) 249 758 or by [email](#).

Energy Contract Update

Facilities and Services has engaged Graham O'Loghlin, an industry consultant to investigate the current energy market and provide advice on any options that may be available to the University. Mr O'Loghlin's report will be available in late June.

The Division is also in contact with several large Canberra based organisations who will be letting their energy contracts in the next two months. This will provide us with a good guide to the likely costs of energy when we relet our contract in September 2001.

Energy Users

A review of the energy consumption for 2000 revealed the following areas as the top five highest users on the Acton campus:

1. Research School of Physical Sciences and Engineering
2. Bruce, Burton and Garran Halls
3. Research School of Biological Studies
4. University Libraries

5. John Curtin School of Medical Research

Combined, these areas use 36% of all electricity consumed on campus.

Energy Efficiency Initiatives in the Ian Ross Building and RSPHysSE

The new Ian Ross Building was designed using ESD principles and with aim of making it as energy efficient as the budget would allow. The building uses passive environmental systems as a means of providing occupant thermal comfort and energy efficiency. These include:

- Solar shading which helps temperatures during the summer months and provides passive heating during winter
- Natural ventilation systems
- Insulation and doubling glazing
- Hydronic slab heating that utilises the mass of the building to provide radiant heating and minimise energy use
- Natural lighting and energy efficient lighting systems
- Solar hot water panels

The Ian Ross Building recently won the Sustainable Architecture Award at the 2001 ACT Architecture Awards. In the citation accompanying the award, the Selection Panel noted that the building was a

"brave and robust demonstration.....that (a) simple and fundamental approach to the basics of ecologically sustainable architecture can still have a significant impact....."

The Division has also redesigned the boilers in RSPHysSE, resulting in greater energy efficiency. Originally the RSPHysSE buildings were heated by three boilers. When the John Carver building came on line twelve years ago an extra boiler was commissioned. The John Carver building needs heating 24 hours a day, 7 days a week, whereas the other buildings do not. Unfortunately the boiler system was designed in a way that meant that when the Carver building demanded heat, all the boilers fired up. This was inefficient, especially in summer time when the other buildings did not require heating. Facilities and Services redesigned the system, removing one boiler (the most inefficient) and installing a water storage tank. The redesigned also ensured that only one boiler (or part thereof) fires up when heating is required by the Carver building.

Energy Initiatives in Toad Hall

Anton Aablers has provided the following information on initiatives established in Toad Hall:

"The refurbishing project in Toad Hall includes steps to minimise the use of electricity. In the lounge rooms used by the residents sensors are used to switch off lights during the day. In the bathrooms time light switches are used and in the kitchens sensors are used again to switch off lights and cook tops if there is nobody in the kitchen. Overall, by the time this project is completed my estimate is that Toad Hall will save approx.48% of electricity used in the accommodation part of the Hall. (Note this is not 48% of the total usage.) We are currently monitoring the use of (power) electricity (not lights) in the bedrooms."

Energy Charges

The electricity charge is made up of a combination of network and supply charges. The network charges, which contribute 70% of the total energy charge, are regulated. These charges are reviewed on a five year cycle by the Independent Regulator for the ACT, who is the only authority authorised to increase these charges. Network charges are subject to increases in line with the CPI.

The energy supply charge, which makes up 30% of the total charge, is subject to market forces. It is this component of the electricity charge that is likely to rise significantly with the new energy contract.

Switch it off Campaign

Over the past four months we have been placing "switch it off stickers" in offices all across the campus as part of the [ANUgreen](#) program. These act as a visual prompt to switch off computers and lights when they are not needed and to close windows before you go home at night. If your area does not have the stickers as yet, please let [Bart Meehan](#) know and he will make arrangements to have them placed in the building

Energy Conservation Tips for the Office

Office energy use is one of the fastest growing energy use sectors in Australia. The commercial power sector now consumes 22% of Australia's total electricity supply. Within this sector up to 35% of total electricity consumption can be attributed to lighting, 20% to heating, cooling and ventilation and 20% to office equipment use. With that in mind, there are opportunities to generate significant savings by simply changing the way individuals within an area manage energy use in their offices. The following tips may help to reduce the amount of waste energy used by your area:

Lighting: In the past it was commonly thought that leaving fluorescent lights on was more cost effective than switching them off. However, in recent years opinion has changed. Modern electronic ballasts are very efficient and have the capacity to endure thousands of on/off cycles. Turning lights off more frequently does reduce their rated lamp life, however by leaving the light on continuously rated lamp life hours will be reached much sooner. By frequently turning lights off the time between lamp changes is increased. The key is to determine the appropriate frequency - the crossover point. This point is where savings in electrical energy begin to outweigh the cost of decreasing lamp life. The Australian Greenhouse Office suggests that the appropriate timeframe is ten minutes. *Therefore we suggest that if you are leaving your office for a period of ten minutes or more you should turn your lights off* (and you should always ensure they are turned off at nights and over weekends). There is a small spike when lights are turned back on but it is of such short duration that consumption is negligible. In relation to incandescent lights, they have a crossover point of almost zero so it makes sense to switch them off whenever they are not required.

For a thorough analysis of lighting operation and maintenance issues see the [Energy Ideas Clearinghouse Energy Solutions Database](#).

Computers: Most modern office equipment is [ENERGY STAR](#) rated. That is, it has been designed with power saving features (standby or power down mode etc) that reduce electricity consumption. However, in relation to PC's this is only useful if the operating system can access these features. Unfortunately, the Windows NT4 software used widely throughout this campus does not have this function. That means that if computers and monitors are left on they are using maximum wattage all of the time. The typical modern PC with a 17" monitor consumes between 120-160 kWh of electricity. If left running continuously, at current energy prices that equates to approximately \$60 per computer per year. A 17" monitor running continuously consumes approximately \$40 per year.

Throughout the campus it is common for computers to be left on continuously, and in many places monitors are also left on all of the time. If your IT manager suggests you leave your computer on, then you should do so. However we do suggest that monitors can be turned off once per day at the end of the day. By doing this the annual cost per computer can be reduced to approximately \$32, and the annual cost per monitor to

approximately \$12 per year. In an area with 200 computers this equates to a saving of approximately \$6000 per year, when extrapolated to the whole university (approximately 6000 computers) the potential savings are huge. Apart from saving energy this will also reduce potential fire hazard, and reduce the cooling requirements in computer areas.

If your computer system is something other than Windows NT4 then we suggest the following:

- Ensure that power management capabilities are enabled (these are often disabled by computer suppliers).
- Even if power management functions are enabled always turn your monitor off, because it will still consume approximately 30kWh - the minimum wattage to be [ENERGY STAR](#) compliant.

For more information on [ENERGY STAR](#) and energy conservation ideas see the following websites:

<http://www.energystar.gov.au>

<http://www.energystar.gov>

<http://www.energyideas.org>

Renewable Energy (Electricity) Regulations

The Federal Parliament has recently passed the *Renewable Energy (Electricity) Act 2000*. This Act places a legal liability on wholesale purchasers of electricity (in the University's case - the company retailing our energy) to proportionately contribute towards the generation of an additional 9500GWH of renewable energy by 2010. (This will be phased in from 2001.) In simple terms, approximately 2% of the total energy produced will have to come from renewable sources. While this is a positive step towards improving the environment, it is important to note that "green energy" is currently more expensive than traditional energy, though this may change as more renewable energy technologies are developed. Therefore, in the medium term this will probably have some impact on the overall price of energy.

The University already purchases *green energy* as part of its overall energy requirement.

Energy Management Option (EMO)

In order to abate the energy consumption of the University's computers the Facilities and Services Division is in the process of trialing Energy Management Option (EMO)

software. This software shuts all computers and monitors down at a particular time each day after back ups have been performed. This software was developed to address the inability of Windows NT4 platforms to access the energy saving functions of computer equipment. It is also compatible with Windows 2000.

When shutting down, EMO saves all open files in temporary files and upon restarting locates those files for the user. It will also display what savings (in dollars, kilowatt-hours and greenhouse gas emissions) have been made as a result of the previous nights shut down. Over time these figures can be aggregated across a network to give a summary of the savings arising from the use of EMO. And the savings will be significant, particularly considering the average computer when left on 24 hours a day, 7 days a week consumes over 1100 kilowatt-hours of electricity per year at a cost of approximately \$60.