

## Housekeeping

Small changes made around the laboratory can provide significant environmental benefits. The ideas provided below are all low or no cost ideas which can provide energy, resource and water savings.

### Dash the sash

Fume hoods are significant energy users in the lab. The sash is the protective barrier between the experiment and the researcher. Air is being constantly drawn through the fume cupboard and discharged through the ducts outside.



An open fume cupboard sash produces the same amount of carbon emissions as three average Australian households.<sup>1</sup>

When the sash is open the pump operates at a higher rate using more energy. It draws more clean air from the lab through the cupboard. This also places a higher load (and uses more energy) on the lab air conditioning system as the fresh air drawn into the lab to replace that discharged through the ducts needs to be either cooled in summer or heated in winter.

The sash should be kept as low as possible during operation and only raised to the highest level during set up of the experiment. In general the sash should be shut. The Fume Cupboards fact sheet has more energy saving ideas.

### Spring Clean

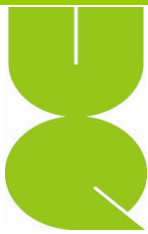
Often chemical requirements change over the life of a project and chemicals may be left on shelves when they are no longer needed or are left behind by researchers when projects are completed. Annual (or more frequent) chemical audits can reduce the chance of chemicals being forgotten or unsafe storage. Consider the use of experiment name tags to allow easy identification of chemicals and experimental equipment. Visit the Chemical Store website to arrange the removal of unwanted chemicals: [chemstore.science.uq.edu.au](http://chemstore.science.uq.edu.au).



Annual audits of labs and clearing out anything no longer needed can reduce risk of environmental spills or incorrect storage and also allow some shelf space to be reclaimed!

Similarly, samples are often left in fridges and freezers when they are no longer needed. This takes up valuable storage space and in some cases can mean additional fridges and/or freezers are operating unnecessarily. Annual (or more frequent) audits of samples in fridges, freezers, walk-in-freezers and on shelves, and correct disposal of out of date samples can free up significant storage space and even allow a freezer to be switched off.

<sup>1</sup> Monash University, "Some facts and stats about fume cupboards", <http://fsd.monash.edu.au/some-facts-stats-about-fume-cupboards>, accessed 7/4/2011.



# The University of Queensland

## Green Labs Program



Permanently switching off a freezer can save approximately 600kWh/year which is the equivalent to permanently switching off 13 compact fluorescent light bulbs.<sup>2</sup>

### Defrost freezers frequently

Ice acts as an insulator. When it builds up in a freezer, the motor uses more energy to maintain the required temperature. Freezers should be defrosted when the ice is greater than 5 mm.<sup>3</sup>

### Size does matter

Significant amounts of resources can be wasted by using appliances which are oversized for the task. For example, autoclaves use the same amount of energy to operate regardless of whether the load is small or large. Similarly, dishwashers use a similar amount of water with a large or small load. With a little bit of preparation it is often possible to schedule equipment to operate with a full load.


Alternatively, if equipment is significantly or frequently oversized consider downsizing. Investigate whether a neighbouring lab has similar equipment needs and could pool resources, or if there are infrequent larger loads, use neighbouring equipment for larger loads and downsize yours.

Similarly, resources such as ice, dry ice and liquid nitrogen use significant amounts of energy to generate, transport and store. Ensure container sizes are the minimum required for the task, so that excessive amounts are not wasted unnecessarily.


### Forward planning

Switching off equipment when not in use will also save energy. For example, most chillers, ovens, autoclaves and incubators reach their operating temperature within 30-45 minutes. Often this type of equipment is left on permanently as researchers do not want to delay their experiment to wait for equipment to reach operating temperatures. This can waste energy (and water).

With a little forward planning this waste can be reduced. Look at the manufacturer's specifications and find the warm-up period. If it is not specified then time the warm-up period yourself. Record the warm up time on the *Warm up time* sticker available from the Sustainability Office and place it on the equipment. Use this as a guide for when to switch equipment on and plan your day's work with this in mind.



The University of Queensland  
Green Labs Program



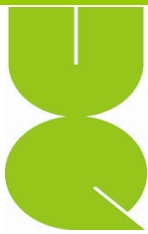
### Warm Up Time

This appliance takes \_\_\_\_\_ hr/min  
to warm up.  
Please only switch it on  
before it is needed.

Warm up time stickers are available from  
the Sustainability Office.

<sup>2</sup> Based on a 500L upright freezer at 620kWh/year and 13W CFL light bulbs (equivalent to a 60W incandescent bulb) operating for 10 hours per day.

<sup>3</sup> Australian Government, Department of Climate Change, 02 February 2009, Saving energy when using refrigerators and freezers, <http://www.energyrating.gov.au/rfuse.html>



# The University of Queensland

## Green Labs Program



For example, often glassware needs to be kept in an oven prior to use to prevent condensation. If it takes half an hour for the oven to reach the operating temperature and the glassware needs to be in the oven for half an hour before use, instead of storing glassware in the oven, turn on the oven an hour before the glassware is needed.

Heat losses from equipment such as ovens increase the load on the air conditioning system. Minimising the time equipment is running will have the added benefit of reducing the load on the air conditioning system.

### Waste collections

When new equipment arrives it is often packed in polystyrene and cardboard and can arrive on wooden pallets. All these items are recyclable and can be picked up by P&F. Collect these items in one spot and when there is sufficient volume accumulated (or no more storage space available!) contact P&F at [recycle@pf.uq.edu.au](mailto:recycle@pf.uq.edu.au) to have them collected.



If you have frequent large loads of cardboard contact P&F to arrange a permanent cardboard skip.

### Switch off and save

Switching off equipment when you leave the lab saves energy. Lights, computers, monitors, printers and appliances should be switched off where possible. *Switch off and save* stickers can be placed near switches to act as a reminder. These are available from the Sustainability Office. Refer to the Lighting fact sheet for more information on energy savings from lights.

### Label your space

Stickers are available from the Sustainability Office to help you to *Label your space*. Using stickers like these or a similar method to show allocation of space can assist lab managers to identify spaces which are not being used effectively. This is particularly useful in areas where there are several different groups working in the one space as often resources such as chemicals and equipment are left behind on completion of a project.

### Appliance efficiency

Check the efficiency of electrical appliances by borrowing the energy monitoring equipment available from the Sustainability Office. Recording the energy consumption (e.g. kWh/yr) and comparing to manufacturer's specifications or with energy use of the same piece of equipment measured again or at a later date can help you monitor its efficiency. Contact the Sustainability Office for access to this equipment at [sustainability@uq.edu.au](mailto:sustainability@uq.edu.au).

### For further information contact:

Sustainability Office

Property and Facilities Division

Ext. 69959 Email: [greenlabs@pf.uq.edu.au](mailto:greenlabs@pf.uq.edu.au) Internet: [www.uq.edu.au/sustainability](http://www.uq.edu.au/sustainability)

