

## Guide to energy-saving in the lab

Use this guide to find out where your lab is already saving energy and how you can improve your energy-saving practices. It is divided into three main sections: temperature regulation, lighting and equipment. Because lighting and equipment produce heat, good control of both improves the ability to regulate the room temperature efficiently.

If you have a student-facing role, your good practices can be instilled in students, producing energy-considerate lab users for the future.

### Temperature regulation

- To ensure good circulation of heat, move furniture away from the heat supply
- Remember that office and lab equipment can produce considerable heat
- Take regular active breaks to maintain circulation and regulate body temperature
- Keep your colleagues informed of good practices
- Dress for the weather
- Retain or reflect heat from the Sun using your blinds
- Understand how sunlight warms your lab space
- To cool a room down, opening windows should be the last resort. First, turn the heat down and distribute the heat more widely (open a door)
- If you open a window, make sure all radiators are off
- Avoid unnecessary lighting – heat is emitted

### Equipment

Our reliance on equipment especially to perform research demands great energy use, but also significant potential to improve our energy-efficiency. Ovens, incubators, mass spectrometers, water baths, controlled environmental chambers, laser microscopes are all examples of equipment that requires energy use across the University. Efficiency of equipment is gradually improving, but it must be used correctly to ensure the potentials for energy saving are met. This guide focuses on some common energy-intensive equipment: fume cupboards and cold storage.

A lot of equipment emits heat *as waste energy*. By having an awareness of this, you can reduce the need for energy-demanding temperature controls. These suggestions will help you to optimise the energy-efficiency of your equipment, prolonging its lifespan.

## Fume cupboards

- CLOSE:** to create a safer working environment, close the sash. Conveniently, this can also reduce energy consumption by 50%.
- UNBLOCK:** fume cupboards will work harder (consume more energy) if there are blockages/obstacles to the air flow. Ensure there are none.
- TURN OFF:** avoid using them as storage space – they're very expensive as cupboards. Turn them off when they're not in use.
- SHARE:** create some space by sharing fume cupboards. By reducing the number, you'll save on costs and reduce the need for temperature regulation in the lab.

An average fume cupboard costs £2000 worth of gas and electricity to run continuously for a year with a fully open sash.

## Cold storage

- Appoint a cold storage monitor to be in charge of maintenance and daily temperature checks.
- Schedule and perform regular defrosts and remove samples not accounted for; this can prolong the facility's lifespan and can free up space.
- The temperatures of cold storage facilities are often unnecessarily low. Ensure yours isn't.
- Make efficient use of space. This has many benefits: fit more in (facility works less hard, reduce facility numbers), find things more easily (keep the door open for less time).
- Allocate racks rather than whole freezers to PIs, thereby reducing fridge numbers.

Some Manchester University labs prevent PhD students leaving old samples in freezers by raising the issue in the completion form they must submit before graduation.

## Energy-saving suggestions

What can I do?	How will that help?
<input type="checkbox"/> Share equipment and facilities	Make this easy by creating an inventory – saves costs and wastage
<input type="checkbox"/> Schedule regular maintenance sessions and report broken equipment	Prolongs lifespan of equipment. Ensures optimal energy-efficiency
<input type="checkbox"/> Encourage staff to adopt energy-efficient behaviours	Develop an equipment policy (a set of guidelines) to standardise behaviours
<input type="checkbox"/> Make efficient use of space to reduce the number of energy-intensive equipment, e.g. water baths	Position the equipment optimally for your (and other users') needs
<input type="checkbox"/> Turn off non-essential equipment at the mains	You can save 60% of equipment running costs by doing so and you might be surprised what isn't turned on the next day!

## Lighting

Lighting offers the potential to save energy, but is also important because it affects work performance. The levels and quality of light has an impact on alertness, motivation and attention to detail. Moreover, some lighting emits significant amounts of heat as waste energy, so a good understanding of it can improve your control over thermal regulation in your lab.

### Did you know?

- Lighting can account for 15% of a lab's electricity
- 1 kWh of electricity from the UK grid emits 600g CO<sub>2</sub>
- Leaving lab lights on overnight uses the same amount of energy as heating a home for almost 5 months

### Lighting suggestions

- Avoid unnecessary lighting, like in an unoccupied room or when there is sufficient sunlight
- Promote LED lighting because not only are they energy-efficient, they can be tuned more easily to specific wavelengths
- Take advantage of natural lighting, which has positive benefits on wellbeing
- Light personal desks/working space rather than whole room where possible
- Make sure lights are switched off at the end of the day

### Your Notes

Remember, you can add additional evidence to your action plan at [www.manchester.ac.uk/10000actions](http://www.manchester.ac.uk/10000actions)