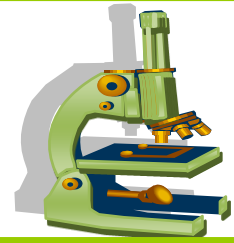


# The University of Queensland Green Labs Program



## Energy Efficient Lighting

Lighting uses a significant amount of energy in a lab area. Whilst lighting is necessary for safety and to carry out duties, often areas are over lit. Lighting infrastructure is installed by Property & Facilities (P&F) and changes to infrastructure means commissioning a new project through P&F Assist. Whilst it is difficult to make significant changes to lighting infrastructure, the operation of the lighting is something you can control.

### Small changes can have a big impact

Some simple actions can be taken to make large energy savings. The following methods can help reduce energy for lighting:

- Switch off lighting during the day if there is sufficient natural light.
- Use task level lighting to direct light to where it is needed rather than lighting large areas. This may be undertaken in conjunction with switching off overhead lights during the day.
- Label light switches so that operators can isolate the switch that will operate their area rather than switching on all the lights.
- When removing fluorescent tubes consider replacing remaining tubes with efficient tri-phosphor tubes that produce 15 per cent more light and last longer than standard tubes.



### To turn off or not to turn off?

Turning on a fluorescent light uses the same amount of energy as running it for 5 seconds.<sup>1</sup> In addition, a fluorescent light can be switched on approximately 6600 times before it will fail to start.<sup>2</sup>

Comparing the cost of replacing the bulb with the cost of electricity, if the light is not going to be used for 10 minutes or more it should be switched off.<sup>3</sup>



### Compact fluorescents

Compact fluorescent bulbs last up to 8 times longer than incandescent bulbs and use 1/5th the energy. Dimmable compact fluorescent bulbs are now available and can save up to 40% of energy consumption.<sup>4</sup> Contact P&F Assist to replace incandescent bulbs at [pffassist@pf.uq.edu.au](mailto:pffassist@pf.uq.edu.au).

### Lighting Audit

Lighting audits can be undertaken of areas to determine if changes in the lighting design or operation would provide a benefit to the area. The OH&S Rep has access to a lux meter, which measures lighting levels. They will know the amount of light necessary for the function of the space.

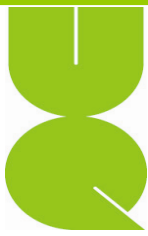
<sup>1</sup> Northwest Energy Efficiency Alliance, Lighting Design Lab, [lightingdesignlab.com/articles/switching/switching\\_fluorescent.htm](http://lightingdesignlab.com/articles/switching/switching_fluorescent.htm)  
USA Department of Energy, 26/01/2005, Newton Ask a Scientist, [www.newton.dep.anl.gov/askasci/eng99/eng99369.htm](http://www.newton.dep.anl.gov/askasci/eng99/eng99369.htm)

<sup>2</sup> Northwest Energy Efficiency Alliance, Lighting Design Lab, [lightingdesignlab.com/articles/switching/switching\\_fluorescent.htm](http://lightingdesignlab.com/articles/switching/switching_fluorescent.htm).

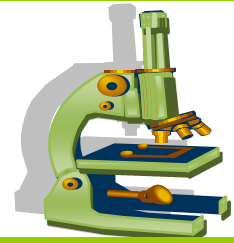
<sup>3</sup> Australian Greenhouse Office, Resource and Training kit / Lighting, 2005.

<sup>4</sup> Origin, 2008, Lighting [www.originenergy.com.au/2678/Lighting](http://www.originenergy.com.au/2678/Lighting).





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Investigate light levels in the area: it is important to remember that some types of lighting lose lumens (or brightness) with age. The investigation should highlight changes that can be made to improve lighting and reduce energy use. To arrange a light audit contact the OH&S Officer.

## Infrastructure changes

P&F are responsible for infrastructure changes (generally funded by your school). If a change in your lab would result in significant energy savings, please let them know.

Examples of small infrastructure changes include:

- Occupancy and movement sensors to automatically turn off lighting in inactive areas such as freezers and storage rooms.
- Light switch segregation to allow lights in areas not in use to be switched off.
- Retrofitting fluorescent light fittings with high frequency eco-controllers increases efficiency and reduce energy use.
- Regular cleaning of light fittings, reflectors and diffusers ensure maximum efficiency. Report dirty light fittings to P&F.
- Auto or step dimmers reduce total energy demand by up to 20-30 per cent. If areas are over lit but switching off the light makes the area too dark consider requesting a dimmer switch.
- Walls and ceilings painted in light colours reduce light requirements. If areas are refurbished request light colours.

### Project help from P&F Assist

If you like the sound of the suggestions listed here, and your group can fund the project, then lodge a works request through P&F Assist. If there is no spare money in your budget, you can lodge a request for the changes to be made out of the P&F Assist fund. This fund has a small budget to undertake improvement works throughout the University. Projects are ranked according to their urgency and resource saving.

## Remove unnecessary lighting

De-lamping is another simple method to reduce energy use. As part of the lighting audit (see above), investigate if it is possible to remove lights in areas where lighting levels are currently higher than necessary. These areas can include:

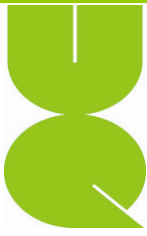
- hallways especially those next to windows.
- office areas with multiple banks of fluorescents.
- where fluorescent tubes are installed in pairs; often one tube is sufficient for the purpose.



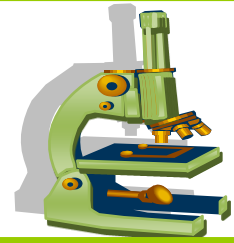
### Lighting reduction

This light has been de-lamped to save energy. If lighting requirements change please contact P&F Assist at [pfassist@pf.uq.edu.au](mailto:pfassist@pf.uq.edu.au)

Inform lab users that de-lamping has occurred by using the de-lamping sticker. This can be obtained from the Sustainability Office.



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If areas have bulbs removed please ensure a tag is attached to the area to let people know that the bulb has been removed on purpose. The tags can be supplied by the Sustainability Office.

To calculate annual energy savings from 'de-lamping' use the following equation.

$$\text{Energy saving (kW)} = N \times (P_{\text{new}} - P_{\text{old}}) \times H / 1000$$

N = number of lamps removed

$P_{\text{new}}$  = power rating of the new lamp (W)

$P_{\text{old}}$  = power rating of the old lamp (W)

H = usage per year (h/year)

#### 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)