



Energy and Environmental Management in the Laboratory

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Conclusive Evidence!

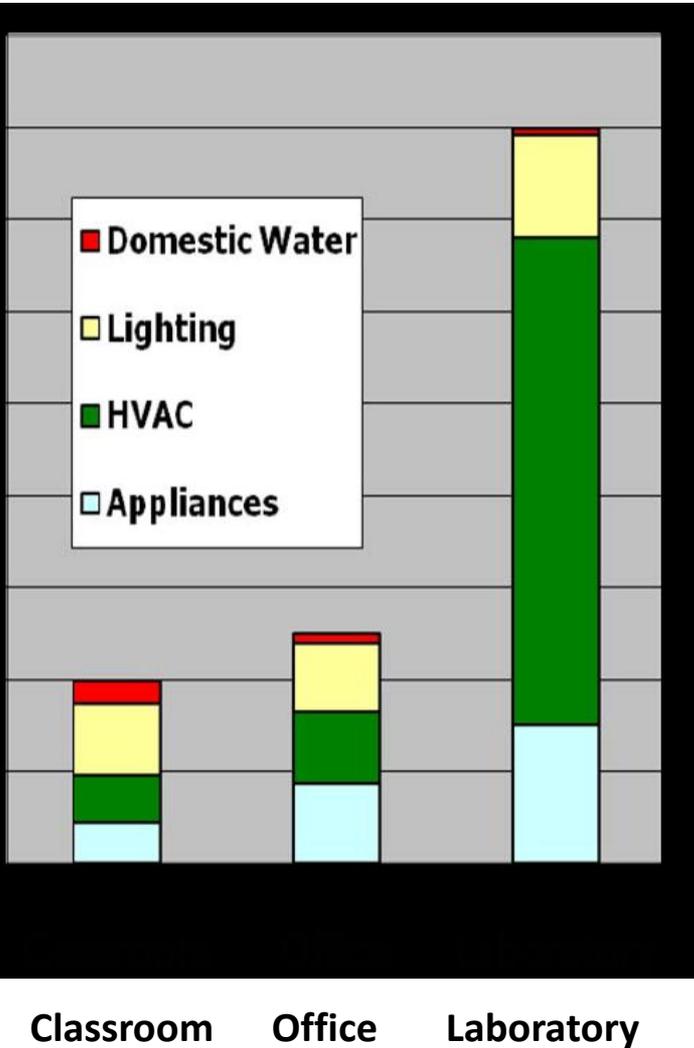




“Labs embody the spirit, culture, and economy of our age...what the cathedral was to the 14th century and the office building was to the 20th century, the laboratory is to the 21st century”

– Dan Prowler, U.S. Architect

Laboratory Focus



- Labs use 3-8 times as much
 - › Energy
 - › Electric/electronic equipment
 - › Chemicals
 - › Wateras an office

And generate 3-8 times the waste too!

ENERGY PROFILE – OLD v NEW LAB



OPPORTUNITIES TO SAVE

- **Health and safety – sensible risk assessment**
- **Better controls, e.g. airflow in fume hoods - use as required, then turn off**
- **Class instruments - switch on when needed; switch off after use**
- **Turn down oven temperature overnight**



OPPORTUNITIES TO SAVE

- **Energy-efficient instruments**
- **New technologies, e.g. automatic timed power-down software**
- **Choose suitable computer settings - Standby, Hibernate, Sleep**
- **Blank screensavers**
- **Are your lab-based computers set up efficiently?**



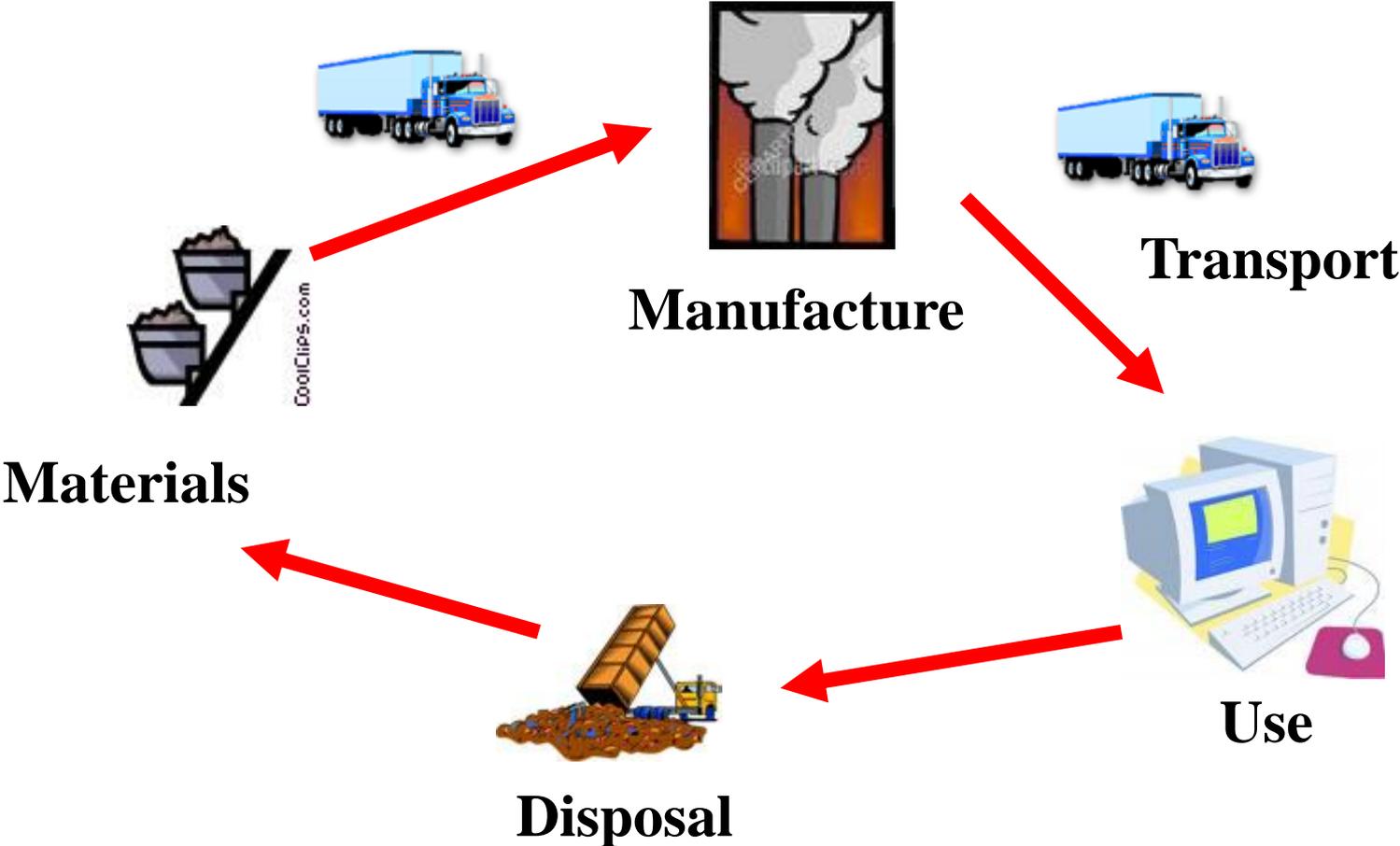
THINK!



EQUIPMENT

- **Regular maintenance and repair**
- **Borrow or share?**
 - › **Fridges/Freezers (including -80's)**
 - › **Autoclaves/ Ovens**
 - › **Centrifuges**
- **Simple model/easily controlled**
- **Automatic timed power-down**
 - › **Fume cupboards**
 - › **Safety cabinets**

Do you really need new equipment?



LIFE CYCLE IMPACTS

CHEMICAL MATTERS

- **Eliminate toxic chemicals – substitute safer alternatives**
- **Replace mercury thermometers**
- **Down-size experiments to micro level – flask → test tube → microsize tube → microwell plate**
- **Mini vials for radioactivity = 75% savings on cocktail and disposal**
- **Surplus chemicals database - share**

WATER

- **Monitor water use – 3 rinse/dump cycles better than 10minutes continuous overflow**
- **Purchase low-use devices**
- **Closed-loop cooling, not continuous flow**
- **Water controls - timers**
- **Replace water aspirators with vacuum pumps**
- **Use purified water sparingly and appropriately from RO systems**

PAPER, PRINTERS, PHOTOCOPIERS

- **Power down printers/photocopiers outside office hours**
- **Encourage paper-efficient printing/copying**
 - **draft mode – “Good on one side” paper**
 - **double sided mode**
- **“No page left blank”**
- **Paper recycling box**



WASTE

- **Large quantities, some hazardous**
- **Monitor chemical stocks, reduce wastage**
- **Separate wastes – general, hazardous, recyclable**
- **‘Freecycle’ day for surplus equipment/consumables**



GREEN INITIATIVES

Anachem/Cruinn

- **Biodegradable racking and packaging**
- **Eco Friendly Merchandise**
 - › **Rulers from recycled polystyrene**
 - › **Mugs from recycled plastic**
 - › **Pencils from recycled newspaper**
 - › **Desk tidies shaped as recycle bins**



AWARENESS AND COMMUNICATION

- Responsibility of ALL staff and students
- Communicate and share – equipment notices, diaries, equipment database
- Little by little – no easy solutions
- Annual environmental report
- Environment promotion campaigns, e.g. energy week
- Rewards for savings



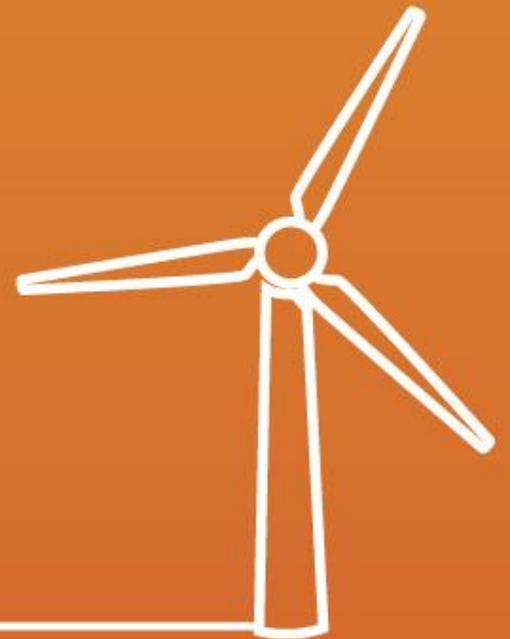
Be Energy Aware

Energy Fact:

One -80°C Freezer costs at least €600 a year for electricity alone

Energy Saving Tip:

Manage your samples – know exactly where they are located.



Eddie says:



Having the fan running in a fume cupboard with the sash open....

....uses as much energy as a whole house!



Close sash; only run fan when needed

TRAINING

- **Whose responsibility?**
- **Environmental awareness as part of induction**
- **Student lab classes – include environmental impact assessment**
- **SOPs – consider and include environment**
- **Nowadays – buy and replace mentality**
- **‘Not done at home – why in the lab?’**

Energy Monitor

The Classic

The first and most popular Current Cost product, this display allows users to monitor the electricity consumption of their home.

Seeing the instant effect of switching on and off appliances on your bill to help change habits.



Thank You

- and don't forget to
POWER DOWN/SWITCH OFF

