



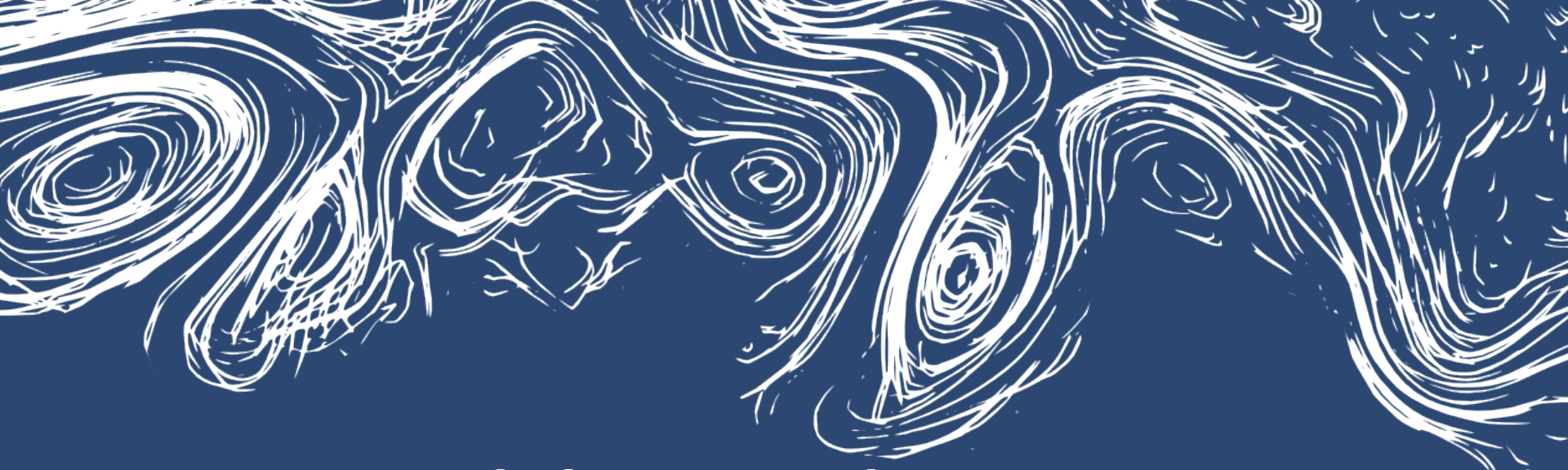
Sustainability in Laboratories – Under looked but overtly necessary

25 June 2014, 12:00-13:00

Speaker:

Martin Farley, Programme Facilitator, Laboratories,
University of Edinburgh

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Sustainability in Laboratories – Under looked but overtly necessary

Martin Farley – Programme Facilitator, Laboratories

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25/6/14 EAUC Webinar



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Social Responsibility
and Sustainability

Today's Webinar

1. Quick background
2. The Issues
3. How to address them



Background

- Worked as a lab technician (US)
- Researched cardiac differentiation of stem cells (NL)
- Both were in ‘wealthy’ labs, yet were laden with inefficiencies



UoEdinburgh

- Position created through combination of:



- Currently 'Laboratories Facilitator' under SRS (Social responsibility and sustainability) department



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Social Responsibility
and Sustainability

'Programmes facilitator – Laboratories'

- Run Edinburgh Sustainability Awards – labs
- Work closely with S-Lab
- Share good practice examples
- Technical advice
- Identify problematic areas, possible solutions, and hopefully implement

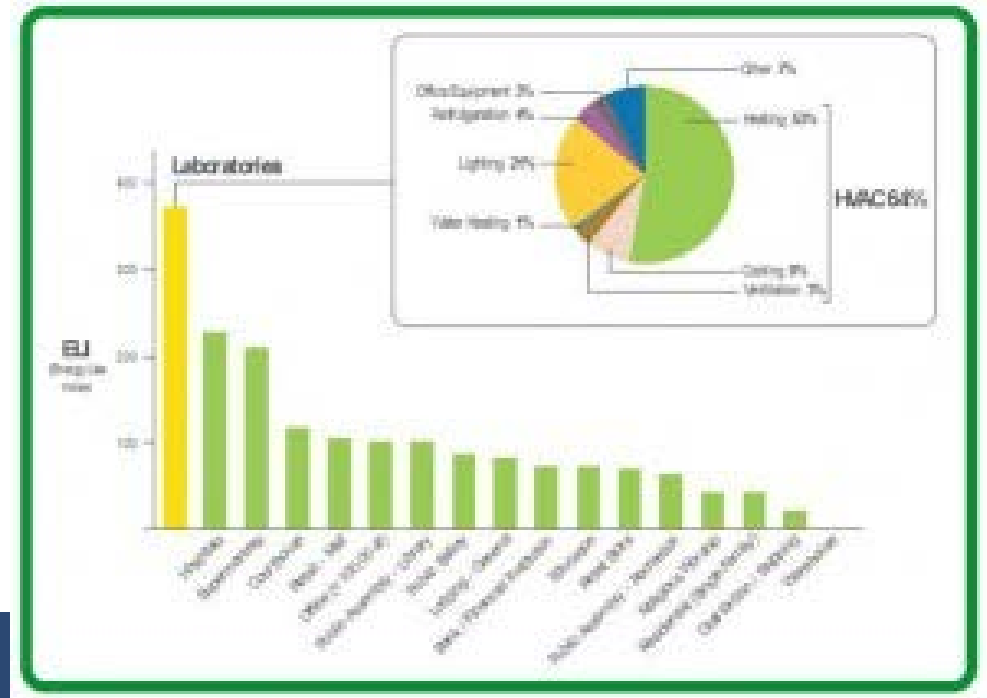
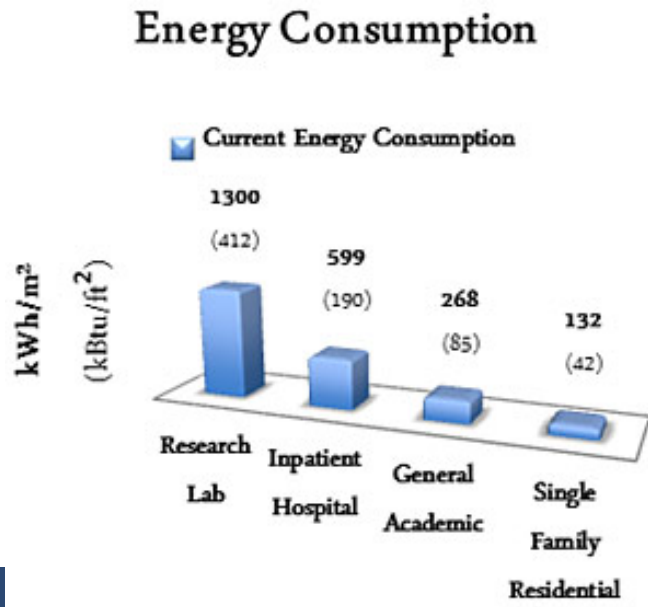




Source: TES, Green League, CAP Data

Sustainability in Laboratories

- Laboratories consume 3-6 times more energy per meter squared in most institutions
- UoEdinburgh - ~65% of electricity is for laboratory infrastructure



Topics: Fume Cupboards

- Identify low flow hoods at purchasing
- Ventilation Survey – Push for retrofitting
- Shut off where possible!
- Shut the sash
 - Waste of ~£1,200/open sash/year



Scientific Equipment

- Currently I act as a resource – Looking to provide procurement with purchasing guide
- UoEdinburgh ‘switch and save campaign’
- Share/Maintain/Reuse/Resale/Disposal



Unplug



Place on a Timer



Turn Off



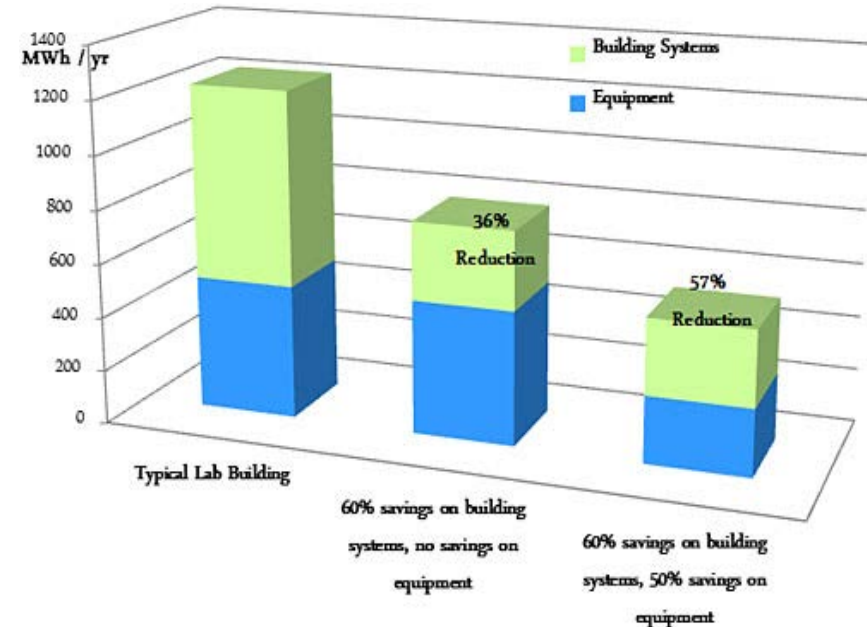
Chemical Management

- Procurement/Management
 - SciQuest chem manager – UoEdinburgh
 - Quartzy – UCL
 - Requires consolidated approach
- Green Chemistry
 - MIT <https://ehs.mit.edu/site/content/green-chemistry>
 - Subsport.eu
- Disposal (eth. Br., sharing possibilities)



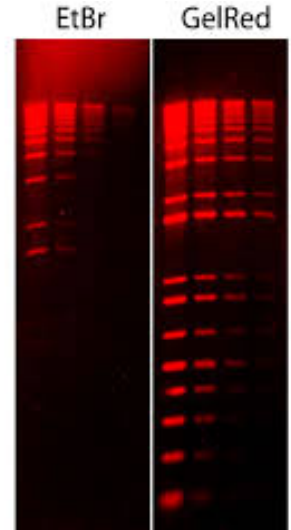
Building Level

- LED/efficient lighting
- Air change rates/hour (ACH) – CIBSE standard?
- Cold Storage management – Passive ventilation
- Building level change – Ideal for good practice implementation



Various Opportunities

- LED exchange for microscopes
- Phasing out ethidium bromide
- Equipment sharing - WARPit
- Helium Management: Looming crisis
 - In house recycling
 - BOC opportunity



Laboratory Management/Training

- Inductions
- Exit Policy
- Raising awareness for all – including students
 - Speaking at health and safety talks
 - Laboratory Demonstrator guide



Why sustainability matters in the lab

Lab work has a significant impact on our planet, ranging from energy and resource consumption to chemical and equipment use and disposal.

Most researchers aren't aware where the bulk of energy is consumed or how to curb usage. Sharing how and where energy is consumed can empower you to optimise methods while reducing wastage and inefficiencies wherever possible - saving money for more science.

This document is intended to be an introduction to how to achieve this in ways that can even improve the science.

Labs often use 3-5x more energy than other academic buildings, and yet we rarely address how that energy is consumed



Peter James, Director, S-Labs

Questions?

Contact our Laboratories Facilitator
Martin.Farley@ed.ac.uk

First steps to a safer, more sustainable lab

- 1 **Close your fume hood sash** when not in use.
- 2 **Manage your chemicals**
Use/order appropriate quantities, and check if:
 - there is already the same chemical available
 - they are disposed of correctly
- 3 **Manage your freezers**
Ensure your freezers are running well, defrosted, and samples are managed. Don't leave the freezer door open longer than necessary, and consider running at -70C.
- 4 **Purchase energy efficient equipment**
- 5 **Power down wherever possible**, particularly on weekends and at night.
- 6 **Be conscious of what you use and why**
Plan experiments to avoid repeats, use appropriate amounts, and avoid unnecessarily using sterile plastics.
- 7 **Recycle wherever possible**. This can be through sharing, appropriate disposal, and even resale.

Key principles

Chemicals and materials Are they being stored safely and used efficiently?

Waste and recycling Is hazardous or special waste being minimised? Are materials and equipment being reused or recycled efficiently?

Management and training Does the lab have a responsibility structure for environmental improvement? Are users aware of the importance of energy and environmental issues?

Cold storage Is your freezer full of non-essential or unlabelled samples? Has your freezer been defrosted and is it running well?

Scientific equipment Is it being used efficiently? Are students being made aware of why equipment is energy intensive and how it can cost a lab?

Lighting Is the lighting appropriate to user requirements and always turned off when not required?

Fume cupboards Are the fumehood sashes kept closed whenever possible? Are they turned off at the end of the day (whenever possible)? Often they're the largest consumers of energy!

Water Is it being used efficiently and recirculated wherever possible? Purified water should be used appropriately, while a running tap should be used sparingly for stainings and glassware is cleaned by soaking (which is most effective).

Cold storage - I

- Savawatt – for -80Cs (12,500 investment, 2-3 year payback)
- Freezer energy consumption studies
 - -80C vs -70C, -40C vs -20C for DNA storage
- SOP standardisation
 - Defrosts, maintenance, alarms, risk, sample management
- Freezer exchange fund and sample consolidation



Cold Storage - II

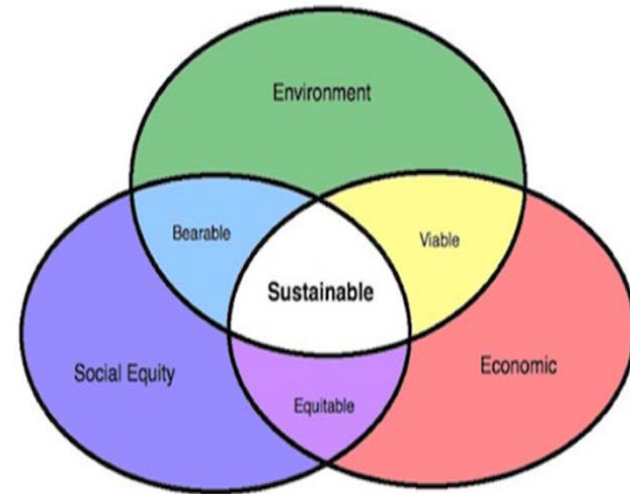
- Long term cold storage study

- Why -80C? Industry driven
- 25-30% energy saving for -70C
- Short term experiments
- Long-term sample viability – providing the evidence
- Survey:
<https://www.survey.ed.ac.uk/longtermcoldstorage/>



Implementation

- Tone/Approach
 - Efficiency => Sustainability
 - Good practice => Good science
 - **More money for research**
 - Research remains the focus
 - Safety is paramount
 - Technical understanding is fundamental to improvement



UoEdinburgh SRS Awards

- Similar to Green Impact awards
- Utilize S-Lab framework
- Our own online evidence platform
- In-house audits by myself and peer-auditors
- Provides access to labs to identify issues



Lab Awards – Evolving Process

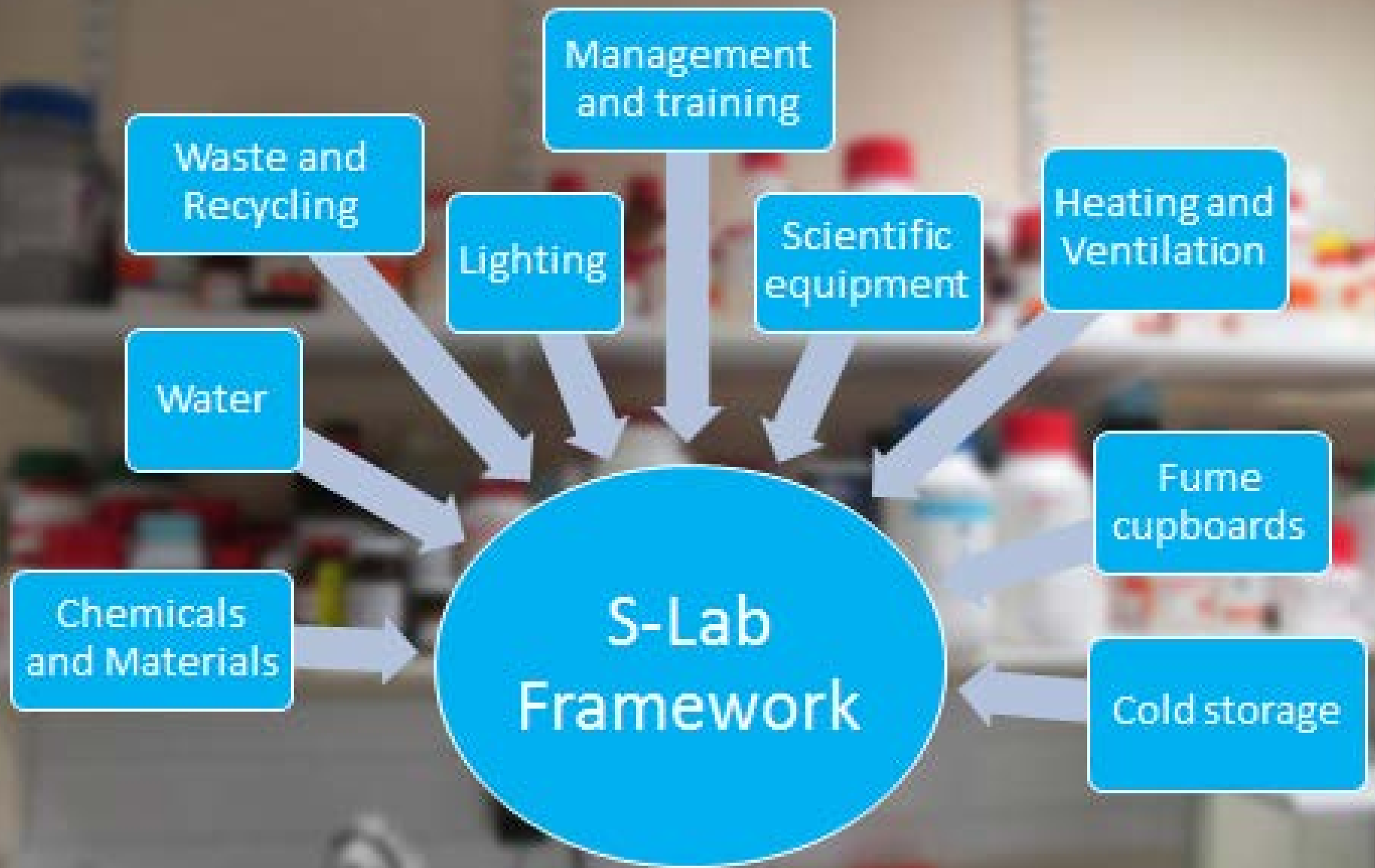
- Laboratories Category
 - Biyearly audits
 - Submitted evidence
 - Continual support
 - Final ceremony



Growing Laboratory Interest

- 7 entries this year representing ~2,500 researchers, staff, students
- Projected for 10-12 next year, up from 4 the previous year (all repeated)
- Increased S-Lab submissions (national awards vs local UoE awards)





Targeted Projects

- Easy wins may be rare, target win-wins
- Gather academic/estates support
- Discuss openly with colleagues
- Evidence based approach
- Funding often key . . .



Funding?

- Initial outside funding can lead continued investment
- Make case based on potential incurred savings



Review

- Laboratories are key areas to target – despite complications, large victories possible
- Multitude of areas to improve in
- Approach may be wide (awards program), or narrow (targeted projects)
- Please spread our cold storage survey!



Contact



- Martin Farley: martin.farley@ed.ac.uk
- <http://www.ed.ac.uk/about/sustainability/be/laboratories>
- S-Lab mailing list: S-LAB@jiscmail.ac.uk
- S-Lab conference in London, 2nd and 3rd of September: <http://www.goodcampus.org/s-lab/>

