



# Supporting World Class Science

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# Lab energy, environmental impacts

- Many are evident and can be tackled directly
  - air quality, chemicals, freezer good practice, fume hood sashes, local equipment sharing, recycling & waste, transport, water etc.
- Many key ones are indirect and not obvious to users:
  - Provision and use of space
  - The ventilation systems behind the fume hood
  - Strategic provision and overall use of equipment
  - Staff productivity and lab procedures/workflows





# UK Science Funding

- Direct state support for universities/specialist institutes
  - core based on students & research/teaching ranking
  - specific, generally for science buildings & infrastructure
  - Higher Education Funding Council for England (HEFCE)
- Tuition/postgrad fees (with some extra public support)
- Research Councils – ‘hands off’ competitive bidding
- Foundations, especially Wellcome as a funder/operator
- Targeted public funding – environment, health etc.
- Contract research



# UK Drivers for Lab Resource Efficiency

- Funding pressures: more from less
  - 2010 Wakeham Review of Research Councils – [URL](#)
  - 2011 & 2015 Diamond Reviews of HE – [URL](#) and [URL](#)
- Carbon/energy demands
  - Demanding energy and other requirements
  - Collective HE target of 43% CO2 cut 2005-2020 [URL](#)
- High and rising costs
  - electricity 20c per kWh or more
  - land \$600,000 per acre (over 2x NYC, 7x Denver)





# Mechanisms (All Non Environmental)

- Research Councils [URL](#)
  - 2011-15 target of c \$600m savings (3-5% pa)
  - Linking overhead cost recovery to efficiency levels
  - Part funding equipment to encourage sharing
  - Other measures (guidance, procurement etc.)
- HEFCE: Transparent Approach to Costing (TRAC) [URL](#)
  - Full economic costing of all research projects
  - Avoidance of cross subsidy
  - Random audits



# Research Councils – Efficiency Rating

- All research organisations placed in 5 Efficiency Groups, based on:
  - absolute level of indirect costs
  - improvement over the previous year
- A varying 'penalty' deduction from indirect cost figures
  - 0-6% in year 1 to 0-18% in year 3+
- Initially only applied to non facilities element of indirect costs
- [URL](#)





# Research Councils – Equipment Costs

- Full economic costing: Example [URL](#)
- Only part funding of most equipment
  - under \$15,000 treated as direct costs, typically an automatic RC contribution of c 80%
  - \$15,000 to \$170,000 standard justification, up to 50%
  - over \$170,000 science/business case, up to 100%
- Encouraging equipment sharing HE consortia
  - standard inventories





# Research Councils – Next Steps?

- More benchmarking
  - equipment performance and use, space utilization
- More focus on facilities efficiency as well as equipment
- Lab/dept efficiency assessment
  - LabRats type Green Lab assessments as a foundation?
- Internal sharing of smaller equipment items & chemicals
- Common standards for more data exchange
- Recommended norms and guidance
- Procurement agreements and bulk purchasing







## Some Other Points

- Salix Finance provides perpetual loans for 'revolving green funds' as per Harvard model [URL](#)
- University of Cambridge has a proxy energy devolution scheme with annual consumption targets for Schools and rewards/fines for good/bad performance [URL](#)
- National Union of Students has incorporated the S-Lab Environmental Assessment Framework into its popular 'Green Impact' audit scheme [URL](#)



# Conclusions

- Much 'hidden' environmental improvement potential
  - best addressed without too much of a 'green' hat?
- Align with good science + organizational agendas
  - 'Win win' actions, Good Laboratory Practice
- Capture 'hidden' knowledge e.g. maintenance, technical
- Align carrots and sticks with control and motivation
- Think holistically about equipment: not just databases
- Target big change as well as routine processes