



Laboratory Environmental Improvement

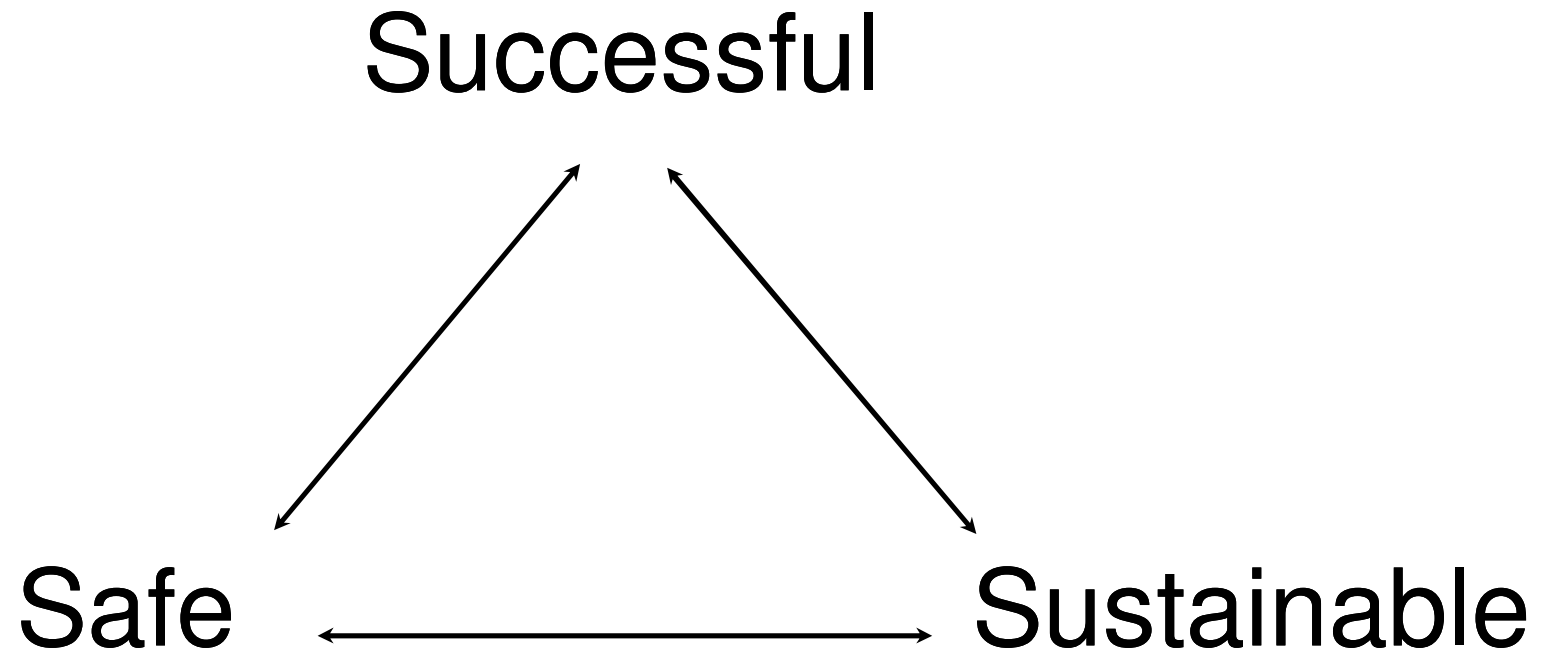


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University of Bradford**

**University of Edinburgh Workshop
23rd April 2010**



The S-Lab

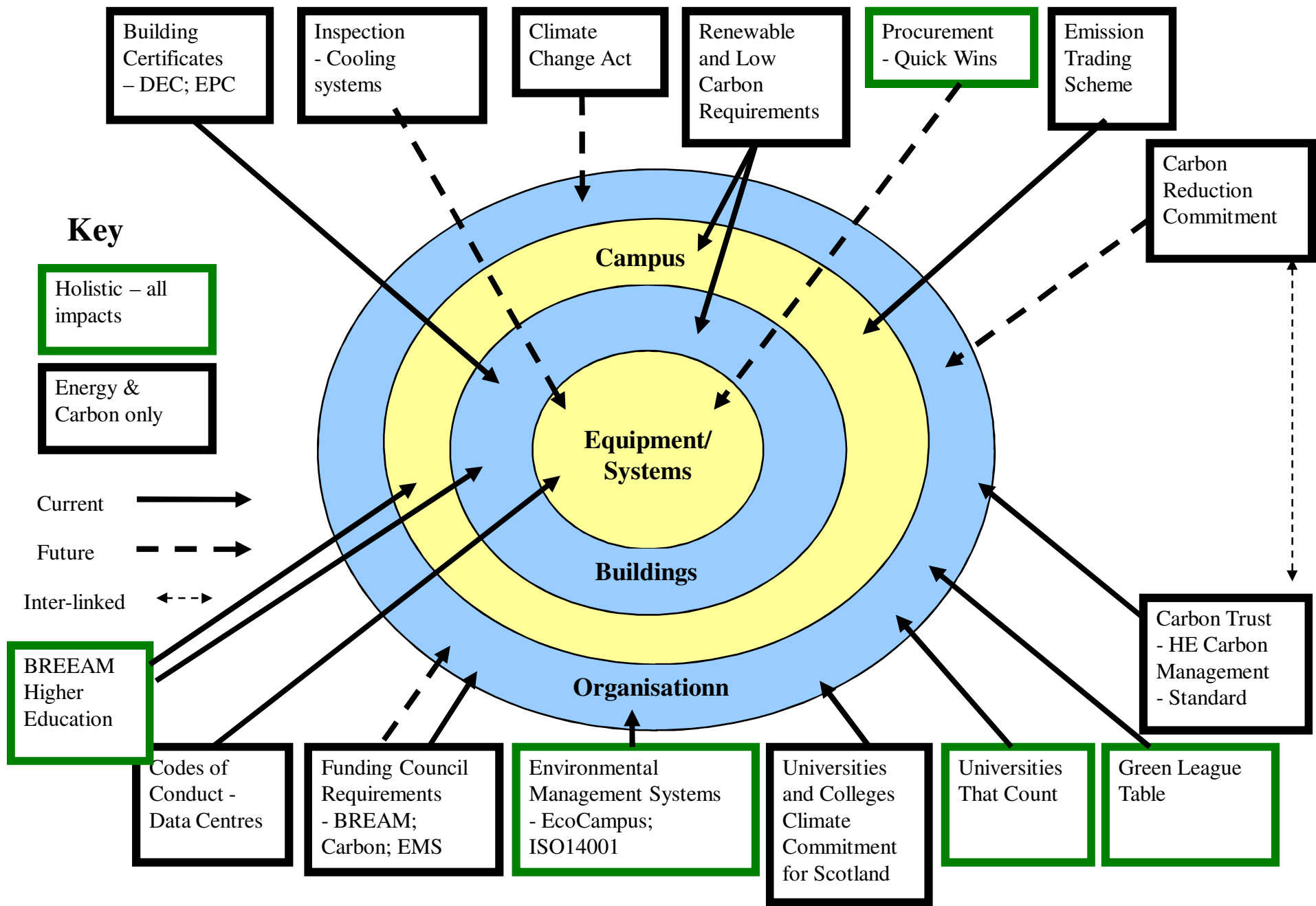


Why Environment?

- ❖ **Regulation**
 - **Carbon Reduction Commitment**
 - **REACH**
- ❖ **Stakeholders**
 - **HEFCE 80% carbon reduction**
 - **2050 compared to 1990**
- ❖ **Cost**
- ❖ **Consistency**

Labs 21 Philosophy

- ❖ **Design integration**
 - understanding the system
 - right sizing
- ❖ **Total cost assessment**
- ❖ **Smooth load following**
- ❖ **Low pressure drop ventilation**
- ❖ **Flexibility**
- ❖ **User/stakeholder involvement**



Lab Impacts

- ❖ **Energy**
- ❖ **HVAC**
- ❖ **Equipment**
- ❖ **Water**
- ❖ **Chemicals/materials**
- ❖ **Waste – much hazardous**
- ❖ **Space**

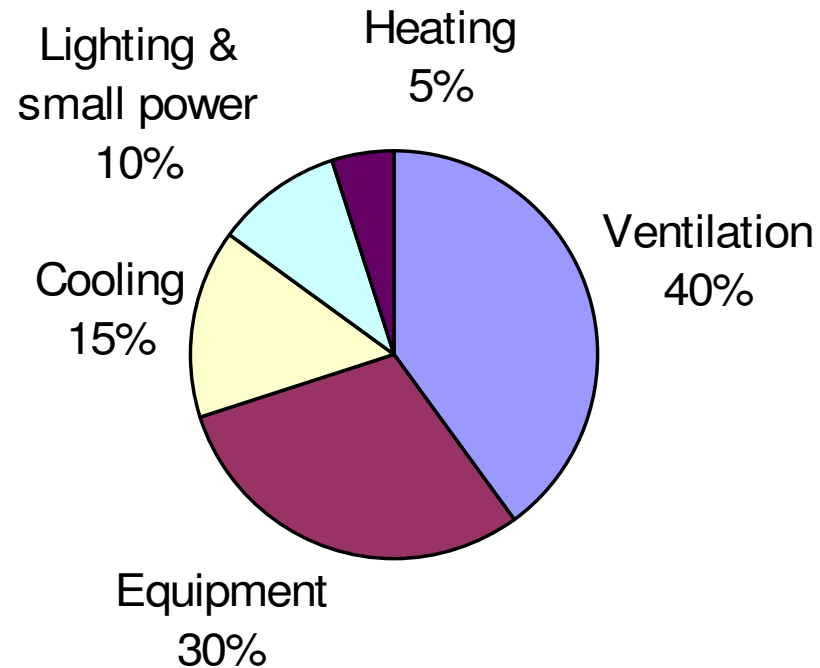


Laboratory Energy Auditing and Footprinting (LEAF)



- ❖ Provide info on pattern of energy use in different labs
- ❖ Identify and stimulate improvement actions
- ❖ Biosciences
 - Edinburgh, Liverpool, York
- ❖ Chemistry
 - Cambridge, Manchester
- ❖ Final results Autumn 2010

LEAF Initial Findings - Bioscience



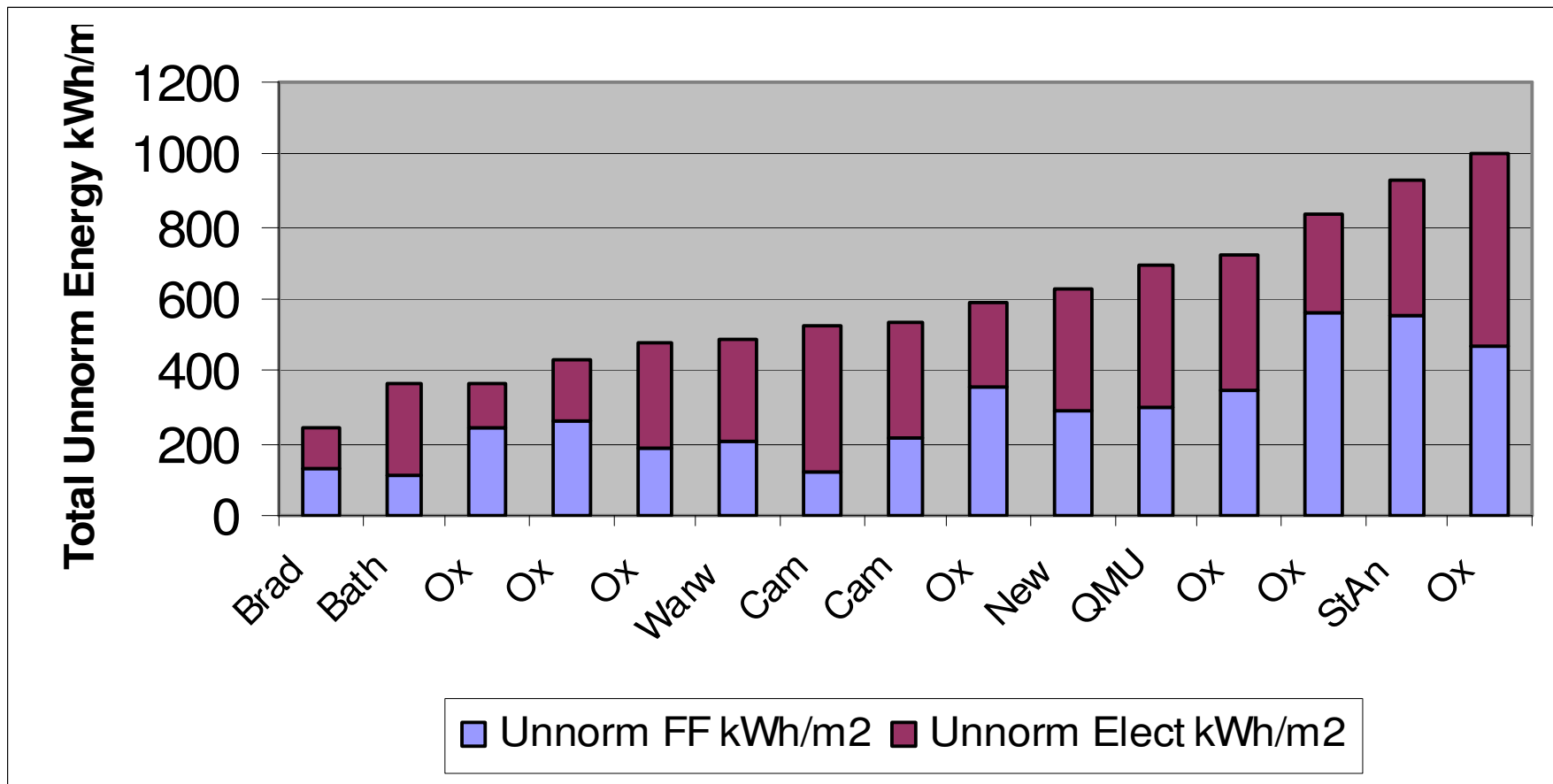


Lab Energy Efficiency (kwh/m²)



	Typical		Good		Best	
	FF	Elec	FF	Elec	FF	Elec
All Labs	296	312	135	227	79	143
Medical/Bio (Secure)	397	362	198	227	100	245
Chemical	353	367	244	333	177	327

Bioscience Energy Use



HVAC Energy Costs

- **‘Millionaire’ laboratories**
 - **Oxford Chemistry lab £1.2 million pa**
- **Typical Constant Volume Fume Cupboard running 24/7 uses ~2-3kW**
- **Equals 1-2 typical houses or >£2,000/y**