Green Gown Awards 2016
Finalist's case study
Dissemination supported by: hefce Higher Education Funding Council for England

University of Reading

Facilities and Services

Extracting Carbon Savings from our science labs

University of Reading

Profile

- Higher Education
- 17,000 students
- 4000 staff
- Suburban
- Top 1% of Universities worldwide

About the project

Summary

A £1.025 million estate-wide review and upgrade of science laboratory ventilation, covering 252 fume cupboards to deliver annual savings of 1,037 tCO2 and £315,641

Project partners

Internal
Heads of Schools
Technical Services
Estates and Facilities
Health and Safety
Building Users

External
Salix and HEFCE
Contractors

The results

The problem

Fume cupboards were identified as large energy consumers and were impacting on our ability to meet our 35% carbon reduction target. A solution was required to ensure the cupboards were still available for students and researchers but that also used less energy.

The approach

Following a successful pilot scheme in 2014 to upgrade the ventilation to 44 fume cupboards, the Dean of Science oversaw an estate-wide review of the University's remaining 208 fume cupboard facilities, leading to approval for a further £1m investment in energy efficiency improvements

Following detailed surveys and design, the final project (including the pilot) delivered:

- Re-balancing of face velocities across the 252 fume cupboards on campus, which were running on average 19% above the University's minimum standard
- The upgrade from fixed to variable air volume (VAV) ventilation for 145 fume cupboards across 22 labs in 3 buildings
- The associated installation of 145 new controllers
- The replacement of 98 extract fans with high efficiency equivalents; delivering an average 32% energy saving over the previous models, including for 20 fume cupboards where VAV ventilation was not feasible

- Re-ducted ventilation to 49 chemical storage cupboards to reduce ventilation speeds and enable the attached fume cupboards to be switched off when not in use
- Installation of a central switch for ventilation to 4 fume cupboards which are seldom used but run on the same fan and could not previously be isolated
- The removal of 2 fume cupboards completely (and making good). The remaining fume cupboards are either sparsely used, or are in facilities which are due to be replaced in the next 3 years.

Our goals

The main objective of the project was to reduce carbon emissions associated with the operation of the cupboards. It was recognized however at an early stage there would also be additional benefits such as an increase in safety and a reduction in the heat demand of the buildings where work was being conducted.

Performance and results

- £315,641 and 1,037 tCO_2 annual savings
- Quieter labs, due to more efficient extract fans
- Warmer labs, due to significantly less heat being extracted from them
- Safer labs, due to less turbulent air – air changes in the teaching labs were measured as reducing from 36 to 10 air changes per hour

The future

Lessons learned

- Continuously running fume cupboards can cost as much as £3,000/year each; with electricity and heating accounting for approx. 50% each
- Technical improvements can achieve good savings; but engaging users to establish good practice remains an essential part of this project's potential
- Unexpected knock-on benefit of much warmer laboratories has been a great engagement benefit with staff and students; finding messages relevant to staff is particularly important

Sharing your project

The project has been well-communicated both internally and externally. This includes:

- Numerous industry publication articles, for example in Labmate, University Business and Laboratory News
- Developing our fume cupboard energy calculator which is now the adopted tool published by Salix Finance for fume cupboard energy saving calcuations
- Articles on our Blog pages and social media coverage
- Presentations at Salix Finance and S-Lab events on the project
- Publically available video explaining the project and numerous informal conversations/email exchanges with other universities regarding this work

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What has it meant to your institution to be a Green Gown Award finalist?

"We are delighted to be nominated for a Green Gown Award for the third year running. This demonstrates the commitment of the University to sustainability as well as our ability to deliver all that we have promised."
Vice Chancellor, Sir David Bell

Further information

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