



Green Gown Awards 2014

Finalist's case study



Dissemination supported by:



University of Reading Carbon Reduction

Sustainable delivery of science lab safety and comfort

Section 1 About the project

Summary

The University has achieved major energy savings in our Chemistry labs, hand-in-hand with delivering a safe and comfortable laboratory environment. Upgrades to fume cupboard ventilation and control systems are saving £90,000 and 343 tCO₂ annually, with a payback of just 2.8 years!

Project partners

The installation was undertaken by CSW, with controls designed and supplied by TEL. Additional contractors included Scion.

Section 2 The results

The problem

44 fume cupboards, each costing around £3,000/year to run, extracted constant volumes of air from the teaching labs, 24 hours/day, 365 days/year. The labs were often particularly cold in winter, due to the volume of air extracted, and the laboratory users had no ability to save energy.

The approach

Re-design of the ventilation and associated control systems, both to the fume cupboards, and the ventilated storage underneath.

Our goals

To design a more efficient solution, which would both save energy and provide a warmer, safer working environment for staff and students. The project aimed to act as an exemplar for similar work across the whole estate.



Profile

- 17,000 students
- 3,500 staff
- Inter-disciplinary research strengths in climate science, health & food security



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Obstacles and solutions

Obstacle	Solution
Constant volume ventilation	Variable air volume control system
Storage ventilated through fume cupboards	Re-duct ventilation so that storage vented just through end cupboards; enabling rest to be switched off
Sash position made no difference to energy consumption	Variable air volume control system, adjusting ventilation speed to constant 0.5 ms^{-1}
Fume cupboards running 24/7	Re-ducting storage ventilation, installed VAV system, and providing new cupboard controls enables switch off out of hours
Savings rely on user intervention	Interactive visual display, designed by competition winner, installed in both laboratories to provide instant visualization of energy use Also installed PIRs to remind users to close sash if away from cupboards
High air turbulence in labs	VAV system has reduced air changes per hour from 36 to 10; meaning less air turbulence
Cold labs in winter	VAV system has reduced air changes per hour from 36 to 10; meaning less heat is extracted

Performance and results

- Electrical savings (including CRC) of £40,208 and 165 tCO₂ annually
- Gas savings of £50,793 (including CRC) and 208 tCO₂ annually
- Significantly warmer laboratories; comfortably reaching 19°C - 20°C, where 16°C was previously a struggle
- Less air turbulence, making for a safer working environment
- Striking, visual display of energy consumption, designed by competition winner, giving immediate indication of energy use

Section 3 The future

Lessons learned

- A fume cupboard running 24/7 costs around £3,000/year to run
- Consultation and collaboration is essential for strong project delivery
- Installing sub-metering prior to work commencing has proved incredibly useful to measure the impact of the project and make the case for estate-wide rollout

Sharing our project

- Internal newsletters, as well as our website and social media
- Coverage in numerous trade publications (at least 7 publications at the latest count)
- Working with Salix Finance to produce knowledge-sharing slides, for use in their regional workshops around the country
- Creation of a dissemination video for the Green Gown shortlisting



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

Being shortlisted in the carbon reduction category of the Green Gown Awards is a great boost both internally and externally in our efforts to continue our carbon reduction journey. With a 23% cut in carbon emissions over the last 4 years, this shortlisting provides a great springboard for our ongoing efforts to hit our 35% carbon reduction target in 2016.

Further information

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