

Green Impact Project Case Study

All that Glitters – Is the Diamond Energy Efficient?

Background

Institution: University of Sheffield

Team Name: Department of Multidisciplinary Engineering Education

No. of years participating in Green Impact: 1st year

Highlights

Please include 2-3 bullet points (of approx. 10 words each) which summarises your case study:

- We have shown laboratory equipment is not our biggest energy wastage.
- AV systems waste a lot of energy 24/7.
- Our building infrastructure systems could be better optimized.

Description

We aimed to identify areas of the Diamond that may be using energy unnecessarily, as the rooms do not have energy metering. Three types of room, a lecture theatre, a computer room and a laboratory were investigated by GIPS.

The survey consisted of an on-line form capturing objective and subjective views of the surveyors, and images from heat sensitive FLIR cameras to show where heat was produced by equipment. We found that laboratory equipment was not wasteful.

Occupancy of rooms outside of timetabled teaching tends to be very low, but incurs the same lighting costs, e.g. two students in a room consumes as much energy as a full class. Similarly, some areas where sensors are supposed to mix natural and artificial light levels appear to be too bright most of the time, and some of the lighting controllers appear to be malfunctioning.

AV equipment is always on, even when it is not being used. MEE approached CiCS to see if AV podiums can be turned off when not in use, as the heat generated is significant. AV staff concluded that damage to the AV equipment is likely if the podiums are turned off inappropriately.

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Photographs – the bright colours show where electrical energy is wasted as heat.

FLIR Image of AV Projectors



FLIR image of AV podium



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FLIR image of Fluids Lab when not in operation: note that the lab equipment at the bottom of the image is "cool", demonstrating that MEE lab equipment is only operated during classes. Our lab technicians ensure labs are shut down between sessions. The "hotspot" at the top of the image is an AV projector.



Self Assessment

Team engagement: 2 points. MEE is a timetable driven department, and staff have little spare time during semester. We have learnt from this that we need to schedule development time during Christmas, Easter and the Summer breaks.

Reach: 5 points. MEE has involved EFM, CiCS, AV, staff and students, but has not yet had time to disseminate the findings and implement follow on actions. Next year we will build these elements into the project plan more fully.

Creativity: 3 points. Using the FLIR cameras and a subjective assessment of heating and lighting has given us new insights into energy usage in the building. There are several follow-on projects underway to address these issues, including a £25,000 SMART building project with EFM to improve our Building Management System (BMS) to provide metering information as a baseline for future projects.

Impact and Measurability: 6 points. The team set out to find where we can target our action to reduce energy consumption, and we have demonstrated that the assumption that MEE laboratory equipment is wasteful and poorly managed is incorrect. We have instigated new projects to implement night time set back of building services, reduce

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fume cupboard use, optimise lighting controls, and reduce the AV energy use.

Proportionality: 2 points. The team has yet to capitalise on the communication of the project findings.

Replication: 5 points. The team has produced on-line survey tools and used equipment that means the study can be replicated and enlarged with ease.

Legacy: 5 points. Although the team is yet to fully disseminate the results, the follow on projects and future funding obtained are significant.

Outcome: 3 points. Due to lack of availability of metering data we were unable to quantify the Diamond energy footprint, but we have excellent and clear focus for our efforts this Summer and for next year's Green Impact.

*Total: **31 points***