

Report Summary: Assessing plug-in laboratory equipment in the University of Cambridge

Laura Briggs, 8 weeks, 13th July – 4th September 2015

Overview: The quantity, nature and energy consumption of plug-in laboratory equipment (any equipment that plugs directly into a building's electricity supply except for IT equipment) was explored using data from many sources for selected study buildings in the University of Cambridge. Recommendations were also made for reducing energy consumption of plug-in equipment drawn from best-practice examples. This work is designed to help reduce the energy use and carbon emissions associated with the use of lab equipment.

Aims:

- Compile a list of equipment held in each scientific research building selected
- Obtain a high level estimate of the energy consumed by equipment
- Research examples of best practice in laboratory management (in Cambridge and other institutions)
- Make recommendations to the departments selected for the study.

Process/methodology: Asset registers from departments and procurement services, PAT test records and energy audit reports from previous consultancy work were compared for a selection of buildings. The energy consumption of the most energy intensive items informed a high-level estimation of the energy consumed by lab equipment. Recommendations were made to reduce the energy consumption of this lab equipment, drawing on examples of best practice from Cambridge and other institutions.

Results: The different records of lab equipment that were examined varied widely in terms of the number and types of equipment that they reported, making it impossible to develop a definitive list of the equipment held in any one department. Where reliable data was available (in only four buildings), a detailed analysis of the energy consumption per type of plug in lab equipment was carried out. The energy consumed by plug-in lab equipment within each building was compared to the building's overall annual energy consumption.

Recommendations:

- Keeping an up-to-date, detailed and accurate department asset register should be encouraged. This could be via Green Impact criteria; a PAT test template should be sent out to assist with this.
- An annual audit could be made of the top energy consuming types of equipment. This could be performed by students.
- The monitoring and maintenance of cold storage units by departments should be encouraged. Environment and Energy could achieve this by loaning socket loggers, providing clear maintenance advice or putting on a training session for freezer maintenance.
- A Freezer Management Policy should be provided as a template for all departments to use, and ask new researchers to sign, to combat samples being left in freezers after researchers have left.

- Central Procurement should be supported in providing departments with advice on purchasing new equipment to ensure it is as energy efficient as possible.
- A feasibility study should be carried out on retrofitting LED's into incubators in other departments, based on the success of Plant Sciences. This should initially focus on departments with a large quantity of incubators.

Conclusions: This study highlighted many discrepancies between data sets for plug-in lab equipment in different departments, as well as missing, inaccurate or out of date data. This shows the need for more accurate and consistent record-keeping of lab equipment in use across the estate. Due to these data constraints, it is not possible to accurately estimate the level of energy consumption associated with the University's use of lab equipment. Nevertheless, there are numerous steps that can be taken to reduce the energy consumption of lab equipment, and some examples of best practice are evident within the University of Cambridge.

Further Information: Please contact [Sally Pidgeon](#) for the full report.