

University of Oxford Carbon Reduction

Oxford University Bodleian Libraries team read between the lines looking for £100,000

Section 1 About the project

Summary

The Bodleian Libraries aimed to reduce its annual utility costs by £100k; £303k was invested in projects giving annual savings of £168k. Over the course of the project, the Libraries saw 22% reduction in their energy consumption with the saving reducing the University's overall carbon emissions by 1.2% per annum.

The project required partnership work and covered a mix of seven complex and challenging buildings including listed buildings. This is now a flagship project for the University's work on carbon reduction.

Project partners

University of Oxford Bodleian Libraries and Estates Services

Section 2 The results

The problem:

Prior to the implementation of the project (Aug 2012), the Libraries department energy consumption was directly responsible for 5.5% of overall University energy use and 6.1% of CO₂ emissions.

The Bodleian Libraries approached the Environmental Sustainability team with their challenge to shave £100k off their utility bills. Together they made a plan to ensure that the project was focused on saving carbon, energy and reducing costs.

The approach:

It was clear that the solution would be achieved through a mixture of interventions, including technical fixes and cultural shifts. The project started with a full survey of all seven buildings involved. This involved detailed energy consumption and infrastructure surveys, energy modelling, space usage surveys, occupancy time measurement, staffing levels and staff expectations. The resulting data was used to produce an extensive opportunities list. This was then prioritised and approved by the Libraries team and Estates Services.



Profile

- University of Oxford
- 22,985 students (includes full and part time students)
- 10,767 staff
- City Centre location
- 20% of buildings listed

Category supported by



Finalist's case study

The fifty opportunities identified covered building insulation, building management system modifications, inverter drives, LED lighting installation, TRV valve installation, heat metering and behaviour change programmes involving all libraries' team members. The opportunities identified were delivered over eighteen months at a cost of £303k.

Our goals

The project's aim was to reduce energy costs and CO₂ emissions and was the first whole department engagement undertaken by Estates Services. The Bodleian Libraries aimed to reduce its annual utility costs by £100k.

Obstacles and solutions

Listed Buildings including Grade 1 listings.	<p>The Bodleian Libraries is made up of a mix of buildings including the Old Bodleian Library building and the Radcliffe Camera. Both of these buildings are Grade I listed so any changes to their internal services presented a considerable challenge.</p> <p>The University has a dedicated Conservation & Buildings team who were heavily involved at each stage of any works. This process ensured that the installation of 21st Century technology did not have a detrimental effect on the listed buildings dating from the 17th Century.</p>
Control of conditioned spaces for conservation.	<p>The Bodleian Library houses some of the rarest and valuable books, manuscripts and maps from all over the World. The conservation of these articles is the responsibility of the specialist conservators within the Libraries department. The conservation of all materials in the Libraries is completed under the guidance of BS5454:2000. This exacting requirement demands the maintenance of precise temperature and humidity control. The maintenance of these standards at the same time as reducing energy demand called for high levels of consultation that resulted in greater understanding by all parties. This level of understanding was key in making progress.</p>
Poor reading space for readers including poorly lit and heated.	<p>As a non-lending library the availability of high quality reading room space is key to the high levels of service supplied by the Bodleian Libraries. Due to the very varied nature of each of the Libraries' buildings it was challenging to maintain high standards and still reduce energy consumption.</p> <p>The introduction of modern heating controls, lighting systems and automated blinds has not only reduced the reading spaces energy demands it has also substantially improved the readers' experience.</p>
Staff knowledge and behavior.	<p>The involvement of all the Libraries team and appointment of EcoReps has resulted in an overall ownership of energy usage within the Libraries' buildings. The whole process has resulted in a greater level of knowledge and understanding from within the Libraries team and Estates Services.</p>
A department geographically dispersed across Oxford.	<p>The Libraries team is dispersed over a large estate with unique buildings delivering individual services. Comprehensive presentations were given to all members of the team from senior management to the shop floor staff. This ensured that all team members fully understood the reason why the work was being undertaken and their individual inputs. This whole department approach enhanced the ownership effect and enabled all team members to communicate effectively.</p>

Finalist's case study

Performance and results

The opportunities completed have delivered:

1. Annual savings of £168,294.
2. Carbon savings to date of 925 tonnes of CO₂.
3. The project being expected to pay back within 2 years.
4. Improved comfort for the visitors and staff from better control of heating, ventilation, air conditioning and lighting
5. Improved experience for students and researchers. Previously, the Libraries reading rooms were regularly overheated by poorly performing heating systems or solar gain. The rationalisation of building management systems, the fitting of solar film on windows, automated blinds, LED lighting and occupancy sensing has greatly improved this situation.
6. Improved storage conditions for books, manuscripts and maps. The greatly improved control of conditioned spaces ensures the materials are kept at optimum storage conditions.
7. The appointment of EcoReps who have taken ownership of the energy issues within the Libraries.

Over the course of the project, the Libraries have seen a 22% reduction in their energy consumption which has dropped from an annual consumption of 11,570,000 kWh to 9,094,000 kWh (1,340,883 kWh electricity and 1,221,622 kWh gas), equating to a saving of 925 tonnes CO₂¹. This represents a 22% reduction in the Libraries' absolute energy consumption, a 20% reduction in their CO₂ emissions, and an associated 20.5% (£168,294) reduction in energy costs.

The savings have reduced the University's overall carbon emissions by 1.2% per annum and also saved a further £14,800 in avoided CRC costs.

The biggest carbon saving achieved is within the Bodleian Book Storage Facility at Swindon where post occupancy commissioning and technical modifications were completed. This has resulted in a carbon emissions reduction of 410 tCO₂ per year.

Another positive outcome has been the continued feedback and involvement of the EcoReps at the Libraries. Their inclusion from the beginning was key to the project's success, especially the further opportunities they identified that have since been funded by the University.

¹ All carbon figures calculated using DEFRA carbon factors from relevant year

Section 3 The future

Lessons learned

1. For a project of this manner to succeed all members of the team have to be involved from the beginning. The ownership of the project must be experienced by all members even if their input is minimal.
2. Full consultation with the specialist conservators was essential for them to be part of the project. They have a heavy responsibility and have to be reassured that any changes will make improvements to the way the artifacts are maintained.

Finalist's case study

- 3 Expect the unexpected. Working in very old buildings takes longer and demands an open minded approach to help find the right solution.

Don't be surprised to find the scope expands as you learn more about the problem. We are still working on the project now and making further improvements.

Sharing our project

The project has put energy issues well and truly on the agenda for the Libraries. A presentation was made to members of the Council of Management about how they could demonstrate leadership on energy consumption. EcoReps were trained with the necessary skills and tools to ensure they are able to highlight issues. The story of the Libraries' success has given rise to a much higher level of interest in the University's Carbon Management Strategy.

The success of the project has been disseminated to a wide audience, both internally and externally. Information is available on both the Libraries' and Estates Service's website, through social media and the AUDE network. Meetings were also held with the Senior Departmental Administrator and Bodley's Librarian, as Head of Department.

A comprehensive presentation to the Libraries Council of Management ensured that all senior managers were aware of the projects. The project will also be included in exhibitions at internal conferences and the Libraries are utilising the national networks to promote the success of the project. A case study on the re-commissioning of the Book Storage Facility is also being produced for the Soft Landings User Group.

Additionally, Libraries intend to utilise the Chartered Institute of Library and Information Professionals network to disseminate details of the project.

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

Being a finalist has meant that the hard work of many is being celebrated and the success will encourage continued work in the area. It has also increased interest from other departments and helped us to promote what is now seen as a Flagship project across the University. It has also given the opportunity for the Libraries and Estates Services to share their experience with others in their respective sectors and networks.

Further information

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