



BEDFORD
BOROUGH COUNCIL

Best IT/E-commerce Project: **Evaporative Cooling Project, Borough Hall**



Introduction

Bedford Borough Council is committed to working with its communities and partners to improve the local quality of life. Working with the Bedford Borough Partnership, we are determined to make the Borough a better place to live, work and visit.

As part of this commitment, we are constantly looking at ways that we can work in a more efficient and sustainable way, with an aspiration to achieve a 40% reduction in our carbon emissions by March 2015.

It is this aspiration that has been influential in shaping our Carbon Management Plan and our recent Evaporative Cooling Project at the Council's headquarters at Borough Hall, which is the focus of this submission.



The Evaporative Cooling Project in progress

Project Details and Cost Effectiveness

Over the last financial year, we have been able to reduce the energy consumption at Borough Hall. However, the Data Centre, which houses the Council's servers, associated communications and storage systems, was a key area where energy savings still needed to be made.

The Data Centre at Borough Hall was being cooled 24 -7 for 365 days a year, using traditional DX air conditioning units which were consuming a vast amount of power - approximately 43,000kWh of power each month.

This meant that the Data Centre's average monthly air conditioning electricity costs were £3,000 (approximately £36k per year) and the Power Usage Efficiency (PUE - Industry standard measurement of Data Centre energy efficiency) was 1.76 (the 2011 average for UK Data Centres was 1.8).

It was agreed that this was one area where our efforts should be focussed to drive down both cost and carbon emissions.

Several solutions were investigated such as replacement DX Chillers, Cold Aisle Containment and air conditioning motor inverter controls. Feasibility, ease of installation and payback were all factors taken into consideration before selection.

Before the decision to install Evaporative Cooling in Borough Hall was agreed, officers from the Council visited the Department of Engineering, University of Cambridge, who had undertaken a similar project, for advice and information about their installation. This proved to be a great opportunity for both organisations to share best practice.

The project team wanted to see an Evaporative Cooling which was retro fitted into an existing Data Centre. Experience coping with warm weather and how air flows were managed were important issues discussed at reference site visit.

The Council's Design Services team were commissioned to design and plan the mechanical and engineering specifications. Evaporative Cooling is relatively new technology for Data Centre cooling and Council engineers were initially unfamiliar with the Evaporative Cooling system. Council engineers worked closely with Evaporative Cooling supplier Eco Cooling to prepare and finalise the installation proposals and plans.

Innovation and Product Selection/Diversity

Suppliers were invited to tender for this project in February of this year.

Following the contract being awarded to Celcius Design Ltd in March, work to install four evaporative cooling units at Borough Hall began in May, with the intention of meeting three specific aims: to cool the server room, to make cost savings and to reduce the amount of energy being consumed.

Evaporative cooling works by bringing water into the cooler from the mains water supply and pumping it up to the top of the unit using a circulation pump. The water is then dispersed over evaporative pads using a water distribution system, which allows the water to continually flow over the pads so that the pads become saturated. Air is then drawn through and the water evaporates – cooling the air as it does so. The cool air is then ducted into the Data Centre by means of powerful fans.

Custom-made ducting, coloured to blend into the building was produced. Council engineers wanted to ensure the substantial new structure was not an eye sore and fitted into the surrounding installation area. Ducting panels were painted to a carefully selected colour. The four evaporative cooling were positioned so as not to be overtly visible from a distance (please see photos below).



The system was commissioned in mid-June for periods of intensive testing during office hours only and has been fully operational since 1st August.

This project was installed at minimal cost to the Council on the proviso that it would save the Council a significant amount of money over a short payback period of just 24 months.

As previously stated, traditional DX air conditioning was using approximately 43,000kWh of power per month and the Data Centre's average monthly air conditioning electricity costs were £3,000 (approximately £36k per year) and the Power Usage Efficiency (PUE) was 1.76.

By installing the system, and allowing for it to be operational 90% of the time (traditional air conditioning is still being used during periods of warm weather and for testing), the Data Centre's average monthly air conditioning electricity costs will be reduced to £600, establishing a saving of £32,400 per year, and a reduction in the Power Usage Efficiency (PUE) to 1.1.

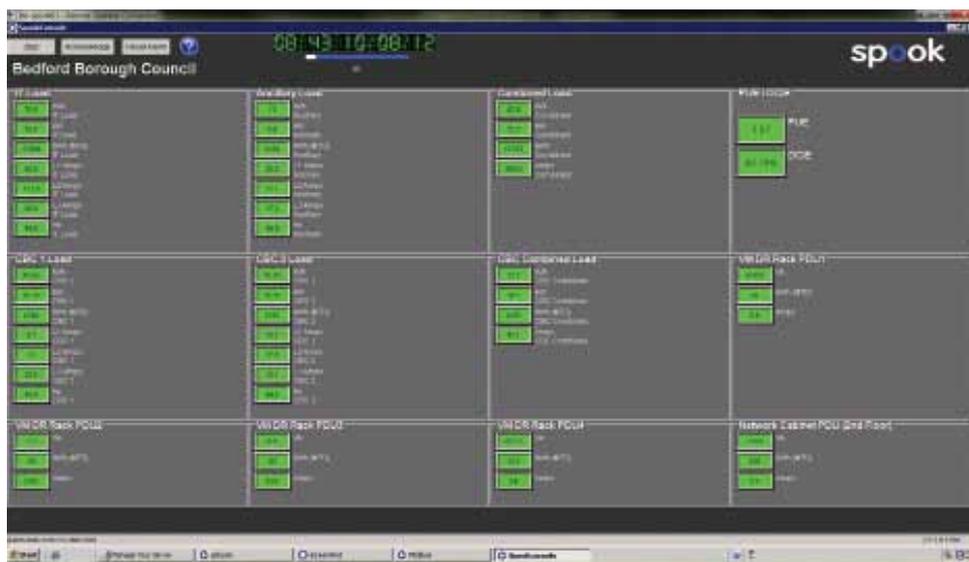
Partnerships

Developing and maintaining partnerships with key stakeholders has been key to implementing this project and to ensure that it will deliver in real terms.

The Council worked closely with both Eco Cooling and Celsius Design Ltd, for purchase and fitting respectively - and colleagues are currently working on a case study for local partners and businesses.

Strong links were required between the Council officers and partners involved in the project to enable effective liaison and co-ordinated decision making.

Our officers have also worked with a company called Spook Ltd to set up a power and environmental monitoring system in the Data Centre, which allows for the real time measurement and monitoring of consumption performance.



Spook Ltd - Monitoring energy consumption within the Council's Data Centre

Carbon Reduction Commitment

The Evaporative Cooling Project is expected to save 274 tonnes CO₂ per year. During the testing period, the project resulted in a 6 tCO₂ saving at Borough Hall.

These savings will contribute to the Council's carbon reduction target and will also help the Council to save significant amounts of money on its electricity bills.

Communication

Bedford Borough Council recognises the importance of making our energy consumption visible within the organisation, and of celebrating our achievements.

Our Carbon Management Plan is one of the most influential campaigns at the Council and the Evaporative Cooling project is key to driving down energy usage across the Council. Now the system is up and running, the evaporative cooling project will be promoted accordingly.

Prolonged communication with staff, stakeholders and the general public will now take place in order to show that;

- The Council is leading by example and demonstrating best practice.
- The Council takes environmental matters seriously and financial savings are being achieved.
- The Council is on track with the delivery of the Carbon Management Plan, celebrating its successes and providing feedback on performance.

Over the coming months;

- A press release is planned, including a case study report which will be uploaded onto the Council's website.
- References and articles will be included in staff newsletters and via the Council's existing Energy Champions, who are tasked with cascading information to their departments/teams.
- Regular updates will be provided to the Carbon Management Group and Carbon Management Programme Board. These groups are responsible for implementing and overseeing the successful delivery of the Council's Carbon Management Plan.

Conclusion

Bedford Borough Council is confident that we now have a system in place that meets our operational needs and contributes to our task of reducing our carbon footprint.

We are committed to working with our communities and partners to improve local quality of life and make the Borough a better place to live, work and visit. The Evaporative Cooling Project is just one project where we can evidence that we have become more sustainable and, as a result, one step closer to meeting our aspirational target to reduce our carbon emissions.



Before the project's installation



The completed installation