

# TREND CASE STUDY

## Trend Controls optimises energy savings for the Brunei Gallery at SOAS, University of London

First published: March 2013

When SOAS, University of London resolved to lower carbon emissions and save money on its prestigious Brunei Gallery, it commissioned Trend Controls to carry out an energy audit and put measures in place to optimise its existing Building Energy Management System (BEMS).



Image by Glenn Ratcliffe

Located on London's Russell Square, in what is now referred to as Museum Mile, the Brunei Gallery at SOAS hosts a programme of changing contemporary and historical exhibitions from Asia, Africa and the Middle East. Its aim is to present and promote cultures from these regions and as well as the gallery itself, the building comprises a series of lecture theatres, classrooms and conference facilities.

Built in 1995, the Brunei Gallery is an integral part of SOAS, the world's leading institution for the study of Asia, Africa and the Middle East. SOAS teaches more than 5,000 students from 133 countries at its vibrant campus in the heart of London. Another 3,600 students around the world are taking our distance learning programmes.

[www.soas.ac.uk](http://www.soas.ac.uk)

There is growing pressure on all educational establishments to improve their energy efficiency, reduce their carbon emissions and save

money through the implementation of systems and procedures that help achieve these objectives. The Higher Education Funding Council for England (HEFCE) has mandated all universities to develop a carbon management plan in order to meet the government's CO<sub>2</sub> reduction targets. When compared to 2005 levels this equates to a reduction of at least 43 per cent by 2020 and figures have to be presented annually through The Estate Management Statistics Record (EMS), which is administered via the Higher Education Statistics Agency (HESA). SOAS has set a challenging target of a 48 per cent reduction as part of their carbon management plan.

Having been awarded a Display Energy Certificate (DEC) operational rating of G (the lowest!) in 2009, the Brunei Gallery presented a substantial challenge for the incoming head of energy management for SOAS, Stephen McKinnell, who was tasked

with improving its performance. He explains, 'For a building that was built relatively recently, its DEC rating was extremely poor. After making some preliminary investigations I discovered that although a Trend Controls Building Energy Management System (BEMS) was already installed, it had been ignored for many years and wasn't playing an active part in controlling energy use.'

With his previous experience of using a Trend Controls BEMS, Stephen was well aware of the potential benefits a fully optimised system could offer. With a clearly defined set of objectives in mind he contacted Trend Controls and commissioned an energy audit. James Dauncey, the company's senior engineer, and Stuart Kuy, its field service engineer, subsequently visited the site to review how the building was being used and identify ways to make improvements.



Image by Glenn Ratcliffe

'When a BEMS is first commissioned it is configured around an existing building layout and occupancy patterns,' comments James. 'These can change over time and incorrectly configured time clocks and setpoints, new layouts, repartitioning, and the addition or relocation of equipment can have a detrimental effect on energy consumption. This was part of the problem at The Brunei Gallery, so we knew that making adjustments to the operation of the BEMS during the audit visit itself would deliver immediate savings.'

After the initial visit a full report was produced that contained an executive summary of the team's findings alongside detailed financial information about the recommended remedial work. It also included an overview of operational issues that had already been rectified and their impact, the effect of the recommendations in relation to environmental information and legislation, and a prioritised summary and schedule of activities that would realise greater energy savings.

On the technology front, the audit discovered a number of issues, including setpoints that were incorrectly configured and were in fact operating the heating system when the building was closed. After assessing plant such as boilers, air conditioning and pumps, the two chillers were identified as an immediate cause for concern, as they were highly inefficient and not operating correctly. It was decided that the best course of action would be to replace them with a single more efficient model.

There were also a number of failed motorised valves that had to be replaced, and the air handling plant was made more efficient by installing variable speed drives on the fans. The outstation controllers were also

upgraded from Trend Controls' IQ1 to its IQ3 devices, which offered expandability to enable the use of remote I/O modules for up to 128 points.

A Trend Controls 963 Supervisor is the brains behind the system and provides a real-time user interface for The Brunei Gallery's BEMS. Dauncey says, 'This Supervisor enables Stephen to monitor the building's plant and building services and make changes to the controls from any PC via an IP address. It even learns the structure of the system, allowing the 963 Supervisor's Device Viewer facility to provide system information without the need for additional programming or engineering.'

By working closely together, Stephen and the team from Trend Controls employed a number of other energy saving innovations to increase overall energy efficiency, such as the installation of passive infrared (PIR) sensors in the lecture theatres so that building services are only fully activated when they are being used. State-of-the-art humidity sensors were also specified, as galleries must have the correct environmental controls in place in order to meet their insurance obligations.

Maintaining adequate comfort conditions throughout the building had been a massive problem, with some areas either too hot or too cold. Stephen comments, 'Being a commercial conference venue the poor climate control often resulted in complaints from organisers and delegates, as well as being an issue for staff, students and visitors. To address this we have introduced zoning of the building to improve comfort and reduce energy consumption by taking into account solar gain, free cooling and occupancy patterns.'



Visit of HRH The Prince of Wales to the Barefoot Photographers of Tilonia Exhibition at the Brunei Gallery 2006

Much of the funding for these projects was provided through Salix Finance, which aims to accelerate investment by public sector bodies in energy efficiency technologies through invest to save schemes. Funded by The Department for Energy and Climate Change (DECC), The Welsh Assembly Government and The Scottish Government via The Carbon Trust, it provides funding for proven technologies that are cost effective in saving CO<sub>2</sub> and that can maximise the potential of any further energy saving technologies.

The Brunei Gallery's fully optimised BEMS has played a pivotal role in helping it become more energy efficient. The building now uses less than half the gas and 20% less electricity than it did previously, its DEC operational rating has gone from G to C and it is helping SOAS to reach its challenging CO<sub>2</sub> reduction targets.

For Stephen McKinnell the completed projects are just the beginning and summarising his experience with Trend Controls, he concludes, 'This was a truly collaborative effort and my knowledge of the building combined with the technical expertise and exceptional customer service provided by James and Stuart has provided the Brunei Gallery with the best possible solution – one that puts us in an excellent position to achieve even greater energy and cost savings.'

For further information please contact Trend Marketing on 01403 211888 or [marketing@trendcontrols.com](mailto:marketing@trendcontrols.com)

## Trend Control Systems

Albery House, Springfield Road, Horsham, West Sussex, RH12 2PQ, UK.  
Tel: +44 (0)1403 211888 [www.trendcontrols.com](http://www.trendcontrols.com)