

# Energy Efficiency

**Winner: University of Glasgow** - Lighting Control to Improve Comfort and Minimise Energy

## Key Points

- The lighting system has been shaped by user demands for natural lighting - and is delivering better comfort and reduced energy bills as a result
- Overall costs have been reduced by using one system to control lighting in three buildings
- The system has a payback period of 8-12 years on single building use, much less when all three are considered

The University of Glasgow's integrated control system currently manages lighting in the new 24/7 Wolfson Medical School and will do the same for the Cardiovascular and Biomedical Research Centres and the CRUK Beatson Cancer Research Facility buildings when they are completed in 2005 and 2006 respectively.

Initial consultation on the design for the Wolfson Medical School highlighted a strong user desire for natural lighting. This was achieved through a glass roofed triangular atrium at the centre of three accommodation blocks, and a sensitive control system to augment daylight with electric light when necessary. This is achieved through daylight controlled dimming, scene setting, blinds control or central time control. The system also controls the motorised solar blinds to regularly change their position during daylight hours. This reduces glare and unwanted solar gain, thereby reducing energy consumption for cooling.

Lighting use is also minimised through microwave presence detectors - initially installed in circulation corridors, stairs and toilets, and retrofitted in seminar rooms. They operate using a sensitive range, capable of responding to all movements no matter how small. On the detection of presence within the building by any of the microwave detectors a time delay of 20 minutes will start. If none of the detectors detect movement after this time within the area, the lighting will begin to dim and switch off.

Alterations and maintenance of the system is carried out via a site based PC, which allows University maintenance engineers to view the system on a room by room or floor by floor basis, with simple graphics informing of system condition. Manufacturers maintenance or system alterations are carried out via a dedicated high-speed modem link, therefore maintenance and re-programming alterations are carried out simultaneously and in a cost effective manner.

The University estimates that the system has reduced the annual School's electricity consumption by 166,093kWh, and electricity costs by £7,000, compared to a more conventional lighting scheme. The avoided carbon emissions of 18.8 tonnes per annum are also a potential credit in the EU Emissions Trading Scheme. In the future, the system should save 141,710kWh annually in the Cardiovascular and Biomedical Research Centres building, and 39,936kWh in the new CRUK Beatson Cancer Research Facility.

The total cost of design, installation and commissioning of the lighting control and management system was £85,000. This was higher than needed to control just the Wolfson school, but much less than the costs of three separate systems. Even so, the system has - just on its Wolfson use - a payback period of 12 years at the university's 2003 electricity prices, and 8 years or less at the prices it will be paying in future.

**Albert Young, Energy Conservation Officer, University of Glasgow**

*"We got user inputs at every stage - conception, design, construction and commissioning - so that we could deliver better functionality as well as reduced energy consumption."*

