

De Montfort University learns important lessons from aIM4SME project

The Institute of Energy and Sustainable Development has shown the importance of intelligent metering in identify energy savings and is applying findings to its own estate. Intelligent metering (meters that are automatically read every half hour) allows you to “see” your consumption at night and at weekends and measure the affect of any changes you make to reduce energy consumption.

DMU, Leicester City Council and nine European partners from five countries are involved in the aIM 4 SME's (Automatic Intelligent Metering for Small and Medium-sized Businesses) two-year project. The scheme has helped a number of the city's businesses shrink their energy and water costs because of the new found knowledge of when consumption typically peaks. New gas, water and electricity meter reading equipment trialled in 32 small and medium enterprises showed as much as a 30 to 50 per cent reduction in consumption, simply by taking data every half hour and making small changes on the back of findings. Widespread use of the intelligent metering system would not only cut costs and usage, but reduce the environmental impact of harmful greenhouse gas emissions.

The benefits of such intelligent metering were so clear to the University, that two years ago it installed half hourly metering in all its buildings. After thorough analysis this data is now being used as part of its sustainable development work to reduce the University's energy consumption and carbon footprint. Recent analysis, for example, of DMU's Queens Building showed a particularly high constant 'baseload' consumption of electricity (see figure 1 in 'notes to editors'). As a result of this analysis DMU has been awarded a £70,000 research grant from JISC to explore how to reduce this high electricity consumption through engaging the users of Queens . The project will employ innovative public engagement methods to 'connect' building users to their electrical consumption. Significantly, the web-based tool for building users will be designed with the building users themselves to help them reduce their consumption.

ENDS

Notes to editors:

For further information or to request an interview with Professor Paul Fleming, please contact De Montfort University's Press Office on 0116 257 7674 or email news@dmu.ac.uk.

To find out more about aIM4SME's European partners, visit <http://aim4smes.com/en/Home>.

Statistics and technical information:

- 32 small and medium enterprises (SMEs) from different economic sectors participated in this project:
 - 8 manufacturing companies
 - 5 business units
 - 4 service-related businesses
 - 3 temples or workshop centres
 - 3 University premises
 - 2 charities (voluntary sector)
 - 2 public houses (pubs)

- 1 hotel
- 1 bakery
- 1 leisure centre
- 1 medical centre
- 1 car retailer
- Since October 2008, 31 data collection systems to record half-hourly data of gas, electricity or water consumption were installed in the SMEs and 1 portable electricity monitoring device for 1 SME.
 - Monitoring systems are connected to one of two central databases hosted by Leicester City Council (Self- Databird) and De Montfort University (DMU-Databird) via a low powered radio network. Other systems are temporary, stand-alone installations (OCR – based)¹ which require data to be manually downloaded from data loggers on site.
- 31 feedback visits and training sessions were conducted between October 2008 and November 2009.
 - During these training sessions, the main features of gas, electricity and/or water consumption were discussed with the SME. The aim was to examine with the SMEs the operational schedules of their major equipment and the patterns exposed by the data analysis. In addition, key items of equipment were identified and general observations were explained. This process provided the SMEs with significant insights into the values of consumption data and helped them to identify the magnitude of energy/water wastage in their consumption profiles. These sessions also provided advice on energy management practices and a set of recommendations according to the observed consumption patterns with operational details.
- 5 SMEs were examined in detail (case studies). Analysis of these SMEs showed that reductions in gas and electricity consumption between 30 and 50% can be achieved through simple interventions that can take place in a short period at a low cost, such as:
 - Continuous monitoring of half-hourly consumption data to identify energy waste or water leaks
 - Analysis and understanding of the energy consumption profiles to identify how energy consumption patterns can be adjusted to match building occupancy patterns
 - Changes in energy management practices, for example, switching off lighting and heating systems over the weekends and out of working hours (e.g. overnight)
 - Installation of temperature controls in heating systems (equipment that measures the outdoor temperature and adjusts the heating system to match the difference between outdoor and indoor temperatures for an internal comfort environment)
 - Adjustment of existing timer controls of heating and/or lighting systems
 - Adjustment of poorly commissioned equipment, such as air handling systems
- JISC inspires UK colleges and universities in the innovative use of digital technologies, helping to maintain the UK's position as a global leader in education. Funding was awarded in Dec 2009 as part of their 'Greening ICT ' research programme – DMU were one of institutions awarded funding exploratory research in this area.
- The Living Lab is a 3-year project to transform the Queens Building into a 'Living Lab'- a visible representation of DMUs passion for sustainability in the real world., it will be led by the IESD and the estates department and steered through the Sustainable Development

¹ OCR is the acronym of Optical Character Recognition

Task Force. Research and grant proposals are currently being developed. We are looking for leading individuals, business, and organisations to support this project and partner with us in its development from inception, research and development to the full-scale retrofit upgrade of the Queens Building.

- The Queen's Building was an award winning building in the 1990s. Its sustainable design in terms of natural ventilation and natural lighting featured in many architectural books. Today it is a shadow of its former self. The energy rating for the building is only a D (on a scale of A-G). All this is even more ironic given that the building houses the IESD (Institute of Energy and Sustainable Development) and the Faculty of Technology. Our vision is to transform the Queens Building to be an iconic, inspirational example [to individuals, government, and business] of a sustainable building achieved through applied research, building user engagement and innovative business partnerships.
- Figure 1 shows one week of electricity consumption from the Queens Building. The chart shows five peaks corresponding to five occupied days. The weekend appears on the left. It is clear that electricity consumption never falls below 50% of the peak consumption. There is a very large constant load which is maintained even overnight on weekends. One of the main benefits of sub-metering will be to make it absolutely clear where this load is coming from within the building.

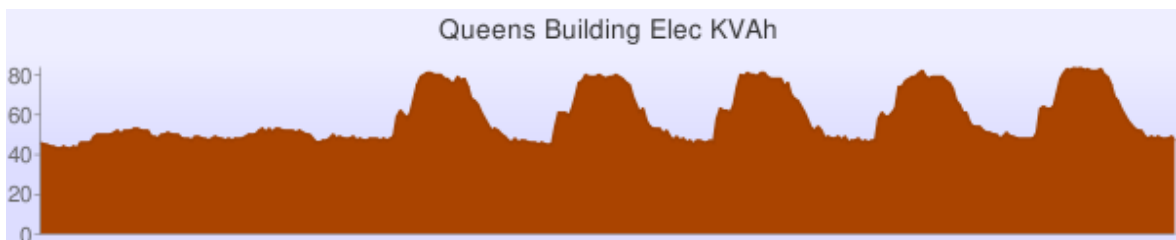


Figure 1: One week of half hourly electricity data from the Queens building



AIM 4 SMEs

aim 4 SMEs – Automatic Intelligent Metering for Small and Medium Sized Enterprises

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AIM 4 SMEs is a Europe-wide project to demonstrate the potential for energy savings from automatic intelligent metering in small/medium-sized enterprises.

The project involves nine partners from five countries (Austria, Hungary, Poland, Portugal and the UK), including businesses, local/regional energy agencies, an association of municipalities, universities and a utility company. www.aim4smes.com

Intelligent Energy  **Europe**

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