



K²n help to chop Cardiff University's leaks

Cardiff is a leading UK research university and a member of the Russell Group of Universities. It has an estate of 313,000 sq metres and its income in 2004/5, following its merger with the University of Wales College of Medicine, was over £300 Million. It currently has 22,000 students and 5,000 staff.

As part of its ongoing responsibilities; not only to make good use of the public funding it receives, but also to ensure it sets a good example in minimising its environmental impact, Cardiff University is committed to continuously improving the efficiency with which it uses finite energy and water resources. It also sources 100% of its electricity usage from low carbon or renewable sources.

Cardiff University uses two main tools to control the energy and water use on its Estate. These are the K²n Energy & Water Management system (which is the significantly enhanced, web based, successor to Cardiff's successful Monitoring and Targeting system) and the Building Energy Management System (BEMS).

Building Energy Management System

As a result of the initial reports from the Monitoring and Targeting (M&T) system in 1992 the University committed to using and upgrading their Building Management System to ensure that they had much closer and clearer control over the energy consumption. This system has been the main instrument through which the Estates department have been able to control the large amount of energy consuming equipment around the distributed University Campus. The system gives almost full control over gas consumption. The control over electricity and water consumption is more limited as usage is end user driven.

Reducing Energy and Water Use in Cardiff University

The Monitoring and Targeting (M&T) system, on which the K²n Energy & Water Management system is based, has continuously provided a monthly report on gas and water use to the Cardiff University Estates department since September 1992. The recent National Audit Office report into Energy Management in the Welsh Higher Education sector identified that, as a result of the issues raised by the M&T system, savings of £200,000 to £300,000 per annum were being achieved through the use of the BEMS system at Cardiff University.

For Water, the consumption has only been monitored since 1995 but knowledge of the consumption has enabled substantial gains to be achieved since then, including identifying a major water leak which had existed prior to the M&T system. Current consumption per m² shows an annual reduction of 31% from the peak in this period. At 2006 prices the savings achieved in Water use alone are worth around £75,000 per annum.

Using these figures the M&T and more recently the K²n Energy & Water Management system provide an annual return on investment of greater than 1000%. In reality the savings are likely to be higher as the University has increased its hours of usage and the intensity of its use dramatically since 1992.

An overview of the M&T system and its impact was first published in the CIBSE journal in 1995 following which the system was the subject of Good Practice Case Study 336 in 1996 under the UK's Energy Efficiency Best Practice programme, demonstrating annual savings of £63,000 per annum against a running cost of £7,200 at that time.

Ian Lomer, now Deputy Director of Estates for Cardiff University, commented in this Case Study:

“The M&T system has proved invaluable in identifying which buildings to target for energy efficiency improvements and modifications to their control systems. Building performance indicators have highlighted where to concentrate manpower and budgets to give the best returns, and regular monitoring has helped ensure that energy costs are kept down. It is also important for us to see that benefits are being achieved and maintained. Without this feedback, we could not properly manage our energy costs”

Since then, despite increasing costs for running the system (as the number of meters read and reported on has increased from around 300 to just under 1,000); dramatically decreased energy tariffs for a long period; and increased energy use across the Estate, the M&T system has continued to return more money to the University than it costs to run on an annual basis. As energy tariffs return back to and exceed the levels that prevailed in the early 90's then the annual savings will again increase providing stronger returns on the annual investment in the M&T system.

K²n Energy & Water Management

In 2005 Cardiff University started the migration of the Monitoring and Targeting (M&T) system onto the K²n Energy & Water Management system. This move was prompted by a number of drivers, including:

- * The need to gain control over electricity consumption by giving users the ability to analyse usage, trends and exceptions without specialist knowledge
- * The ability to undertake the same analysis on gas, oil and water
- * A desire to be able to benchmark the University's performance, by activity, against other comparable Institutions and Governmental benchmarks
- * A desire to enable the M&T information to be disseminated to a wider audience within the University, including the staff and students
- * To enable the university to handle the increasing numbers of meters being installed in the University whilst also meeting current and impending legislation requirements
- * Impending UK and European legislation that not only requires this specific information for building energy use appraisal, but also for appraising the performance of building energy consuming sub-systems such as Air-Conditioning
- * Dramatic increases in forecast Utility costs.

Cardiff has been in the forefront of utility monitoring and targeting in the Higher Education sector for many years, and has identified that the migration of the current M&T to the enhanced K²n Energy & Water Management System offers it the best opportunity of improving the efficiency with which its utilities are used, due to its proven ability to deal with the issues highlighted above.



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