

Nominee: Comtec Power

Nomination title: **Schneider Electric DCIM Halves Leading University's Data Centre Energy Bill, Reduces PUE**

An upgrade to the cooling infrastructure at Cardiff University's data centre has greatly improved the capacity of the University to accommodate prestigious computationally intensive research and has simultaneously improved the overall power efficiency. The level of insight provided by DCIM software has dramatically reduced the payback period from 10 to 5 years.

Cardiff University's data centre supplies the general IT needs of the university but also houses a high-performance computing (HPC) cluster which supports computationally intensive research projects. To position the University as a centre for high-profile research it needed to increase the data centres processing capacity, which in turn created a requirement to upgrade its cooling infrastructure.

The team at Cardiff University calculated that if it could improve energy efficiency (increased by PUE reduction from 1.7 to 1.4) the resulting cost savings would ensure a complete ROI for the cooling upgrade.

The project undertaken by Comtec entailed consolidating nine racks of existing IT equipment into five, to make space for new high-performance computing elements; replacing old chillers which were becoming less efficient, reflected in an increasing PUE; replacing a single twin-head pump with two larger more efficient models to increase resilience and installation of an Energy Efficiency module to the data-centre's existing StruxureWare for Data Centers™ DCIM software from Schneider Electric.

The updated DCIM module improved monitoring of the cooling systems to make tighter management of all cooling elements in response to changing computing and climactic conditions. A further condition of the project was that certain critical services had to be maintained throughout the works by the provision of temporary cooling in the computer room.

The replacement of older 120kW chillers with new 300kW systems improved efficiency immediately but the more precise monitoring and management provided by the new DCIM software module also pointed out the need for a secondary cooling circuit. The software also indicated that the extra piping and pumps would not impact negatively on the overall efficiency of the system.

The Energy Efficiency Module yielded other insights which helped improve efficiency: The chiller water temperatures could be raised to 10.5C from 9C. and the chiller could be shut off while the pumps were in standby mode. Also, changes to the chiller configurations allowed compressor fan speeds to operate in variable speed mode for more of the operating range allowing fan speeds to match power loads in adjacent racks.

The combined effect of all the improvements in efficiency has exceeded the anticipated PUE of 1.4. The calculated facility PUE reached as low as 1.17, and the 9-month average, calculated between January and September 2015 was 1.21.

Hugh Beedie, Chief Technology Officer for Cardiff University said, “To put the DCIM upgrade into context, it costs around £250,000 of electricity per year to run the data centre. By having a good PUE changing from 1.7 to 1.2 I’m saving approximately £125,000 worth of electricity every year.”

Furthermore, the data is constantly being monitored and reviewed to reveal the effects of further minor changes in operational modes. The collection of such detailed information allows cooling resource to be more accurately matched to equipment load as the operators gain a better understanding of the influence of key components of the system.

The project is also currently on track to deliver the expected return on investment in as little as five years, or half the payback time of ten years originally estimated.

Why nominee should win

- Cardiff University’s data centre includes a high-performance computing resource which is essential to attracting world-class research projects to the university.
- The DCIM Upgrade has halved the data centres electricity bill, a saving of £125,000 per year.
- The efficiency of the data centre, in terms of PUE, was improved to a level of 1.17 at peak efficiency with a nine-month average rating, between January and September 2015, of 1.21.
- To maintain such high-performance computing with the necessary reliability and resilience the cooling infrastructure must meet the highest standards of efficiency and resilience.
- The combined effect of all efficiency gains has reduced payback time by half, from 10 to 5 years