

Case Study

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Private Secondary School Energy Consumption Management

The Challenge

The client, a private secondary school in South East England, required support to manage their energy consumption across their main school buildings, sports centre, swimming pool, boarding houses and other facilities on their site.

The Solution

A detailed electrical survey of the school was undertaken to identify opportunities for voltage optimisation, variable speed drives and other electrical systems to produce savings. The school's main electricity supply was logged for two weeks – one week of term time and one week of half-term holiday. Data logged included: power consumption, voltage, current, power factor and harmonic distortion for all three phases.

The average line voltage was around 238-240V but fluctuated by 8-10V between night and day (with the higher voltage occurring at night time). There was less fluctuation during the half-term holiday as would be expected with lower loads. A detailed loads assessment was carried out including load type, function, electrical rating, duty cycle and effective power. This activity provided the basis of being able to estimate the likely savings from voltage optimisation equipment being installed. A 500kVA rated voltage optimiser was recommended with a predicted 6.5 year simple payback and saving over 30 tonnes CO₂ per annum. Additional recommendations included a variable speed drive for the main pool circulation pumps and LED lighting in key areas. Both of these measures had a strong business case and less than five year payback.

The school's sports centre and swimming pool complex was originally designed to utilise a gas combined heat and power system. However, due to budgetary constraints, this was not installed at the time of construction. Detailed plans and proposals for a natural gas internal combustion engine combined heat and power already existed, therefore, and the proposals were reviewed, identifying key project criteria and comparing different procurement options.

A number of support activities were provided to pupils including an evening lecture on the schools, various energy saving projects and a lunchtime lecture on general sustainability issues. Pupils were also given the opportunity to attend and contribute during energy walk-around surveys and meter reading activities with our consultants and the school's facilities manager.

The Outcome

The school was found to have multiple suitable roofs for solar photovoltaic systems. With the Feed-in Tariff at a high level, it was initially proposed to install an 80 panel system (20kWp) on the roof of the school's Art and Technology Building. The initial feasibility and performance modelling was undertaken and planning permission for the system was obtained. A competitive tender process to appoint a contractor and installer was managed and support was provided to the school in the feed-in-tariff registration. The solar photovoltaic system is now operational and working well.



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