Case Study

|T| +44 (0) 870 710 7560 |W| www.catalyst-commercial.co.uk/

Private Secondary School Voltage Optimisation

The Challenge

The client, a private secondary school in South East England required a detailed electrical survey of their sites to identify opportunities for voltage optimisation, variable speed drives and other electrical systems to produce savings for the school.

The Solution

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 for all three phases, power consumption, voltage, current, power factor and harmonic distortion.

As well as monitoring the electrical incomer for the two weeks, a detailed loads assessment was carried out. All main electricity uses were noted including their type, function, electrical rating, duty cycle and effective power. This activity provides the basis of being able to estimate the likely savings from voltage optimisation equipment being installed.

The Outcome

The main results and findings from the survey included:

- Average voltage at the site was around 238V with an approximately +/-4V range of 234-242V
- Power and voltage across the three phases seemed to be well balanced
- Line 1 lost power three times during the monitoring period and this should be investigated
- Estimated savings achievable through voltage reduction lie in the region of 5% (but conservatively 3%)
- With the 4V drop during times of peak load, the installation should be set to a target voltage of 224V rather than 220V (though some systems can self-compensate to deliver 220V constantly regardless of the load or the incoming voltage)

The energy, carbon and financial aspects of the project are summarised in the table below:

Annual electricity saving	54,000 kWh
Annual carbon saving	30.6 tonnes CO_2
Annual bill saving	£4,590
Capital cost of installation	£30,465
Simple payback	6.6 years