CHAUVIN ARNOUX

Measure, Monitor and Save

Even before energy prices started their recent almost exponential climb, businesses could cut their energy bills dramatically simply by analysing their energy usage and identifying opportunities for improvement. Following this approach, a major processor of fresh fruit cut its energy bills in half, as **Julian Grant** of **Chauvin Arnoux** explains.

Though unaware of any specific issues relating to energy usage, the fruit processor felt that it would be good practice to identify the major users of energy in its factory, and to investigate opportunities for energy savings and efficiency improvements. The first step was to engage Smart Energy Solutions NI, an expert in energy efficiency, to inspect the production processes and, where possible, take manual readings from panel meters to provide an indication of energy usage. Discussions were also held with the factory operations manager to determine which items of equipment were likely to be the biggest energy users.

The information gathered was used to develop a real-time cloud-based solution for continuously monitoring critical circuits, so that efforts to reduce energy usage could be accurately targeted on those areas where savings were most likely to be significant. Continuous monitoring would also allow the effect of energy efficiency measures to be assessed quickly and reliably, as well as making it possible to confirm the ongoing performance of those measures' months and even years after they had been implemented.

As a preliminary part of this exercise, Chauvin Arnoux PEL103 power and energy loggers were fitted to the plant's main power users and, almost immediately, these produced an interesting and concerning result: the refrigeration system on the main cold store was running continuously and was consuming energy costing £650 per week at the prices then prevailing. The cold store service provider was asked to check the installation and found that it was switched to manual override, possibly as a result of some earlier problem with the control system.

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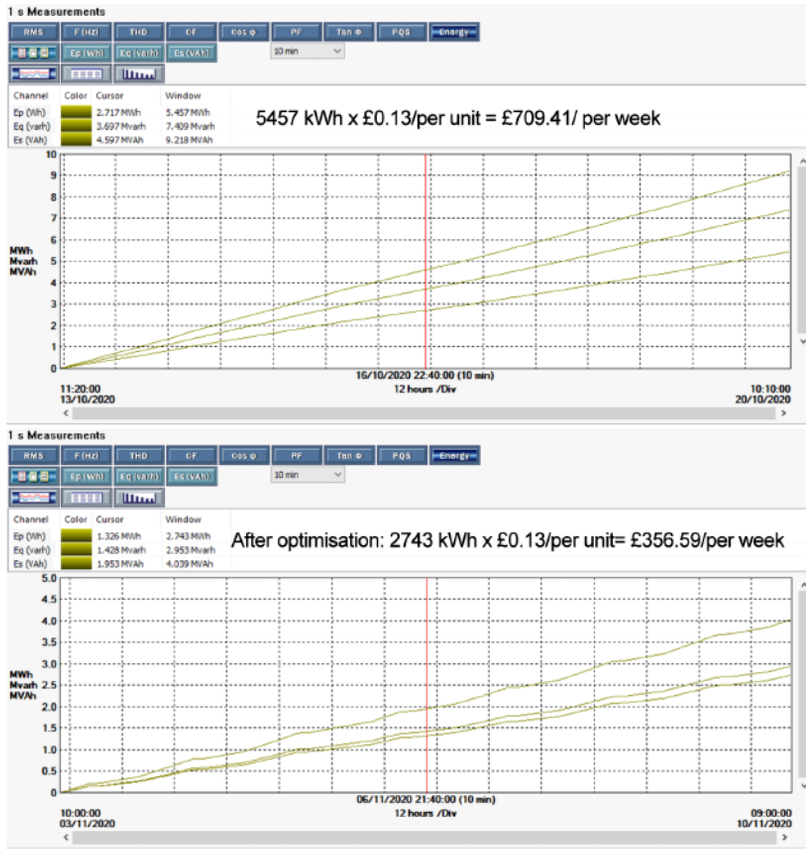
A new control system for the cold store, including an energy-efficient variable speed drive for the compressor, was installed, after which the energy performance was closely monitored for a period. This revealed that energy usage has dropped by more than half, to just £300 per week.

Installation of a full energy monitoring system subsequently went ahead, covering the incoming main supply, two cold stores, a deep chill store, three production lines and two compressors. The work, which was carried out by Smart Energy Solutions, involved network cabling, IT configuration, cabling to mains cable chamber, hard-wired current transformer connection, and the provision of a three-phase reference supply.

Tariffs were set up on a dashboard, and the fruit processor's staff were given training and support to establish baseline data. They were also shown how to identify opportunities for energy saving by looking at historic data, and how to evaluate the effectiveness of energy saving measures by looking at before and after results.

One of the energy saving options that was investigated was voltage optimisation. For this, accurate measurements were again made with a Chauvin Arnoux PEL103 power and energy logger, which revealed line-to-neutral voltages of 239.5, 235 and 244 V. Maximum import capacity was 204 kVA, and a comprehensive load analysis was conducted to determine which loads would deliver the biggest savings with voltage optimisation.

This work led to the installation of a 288 kVA voltage optimisation system, which was sized specifically to allow headroom for future expansion of the plant. Savings from this measure alone are predicted to be around 6% of the energy bill which means that, even before the recent large increases in energy prices, the voltage optimisation system would recover its costs in under three years.



Annual Saving: £18,346.64 Reduction in CO2e: 30.0 Tonnes

Overall, with all of the energy savings taken together, including those delivered by the installation of a new control system for the main cold store, the end user expects to make savings equivalent to 50% of its former energy bills, which means that the payback period for the entire project is less than one year. Could other companies make similar savings? Almost certainly, but without accurate and reliable energy monitoring, they will never know! So, consider carefully, might it be worth your while to invest a little in analysing your energy usage, with the very real prospect of saving a lot?

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