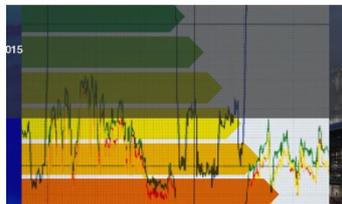




Energy management from A to Z

The utilities used in a company, be they electricity, water, gas, heating or cooling energy, or even compressed air, are invariably metered for invoicing purposes, yet rarely evaluated critically. Utilities represent an enormous cost factor that is often underestimated. It is therefore definitely worthwhile taking a closer look at these costs. The crucial question is, "Where does each consumption figure originate, and is this justified?" Only by posing this question can a company control its consumption of utilities and where necessary take corrective action; in other words, apply effective management. And only in this way can a business reduce its utilities consumption and cut costs, the whole raison d'être of any energy management system. Another benefit: the more detailed the measurements are, the more accurately can utility costs be allocated to cost centres. And anyone aiming to carry out audits—and take advantage of the available incentives to conserve resources—needs an energy management system to provide the supporting evidence required.



Initial Status

Monitoring of utility flows is possible in companies of any size in every industry. This is particularly beneficial in manufacturing companies or in other operations where major consumers of utilities are installed, i.e. everywhere where the potential to achieve significant savings is conceivable. Utilities consumption that is too high can be due to inefficient machinery and plant, but can also be caused by excessive reactive power and uncontrolled peak demand, leakages or processes that consume disproportionate amounts of heating or cooling energy. However, it is not apparent whether things are getting out of hand until consumption figures have been compiled, compared and analysed over a long period.

Measurement, evaluation and optimization of utility flows

At FRAKO, focused energy management means not only installing a data collector but also offering a portfolio of practical monitoring and optimization options based on a modular concept. The heart of this system is a PQM 1588 Power Quality Manager, a DIN rail mounted instrument for data acquisition from its network of measuring and metering devices for all manner of utilities. EMVIS 3000, FRAKO's evaluation and visualization software, is used to process the wealth of data collected. Apart from recording utility consumption figures and managing the alarm procedures when measurement readings stray outside set limits, the system also focuses on certain specific parameters: with the electrical supply, for example, power quality is monitored, maximum demand optimized and power factor controlled. With other utilities, losses due to problems such as leakage or inadequate insulation are identified.

A great advantage of the FRAKO system is that companies can integrate their existing metering and alarm units, monitoring instruments or switching modules with the aid of gateways. The customer is thus free to determine the extent of the energy management system and its extension phases. FRAKO offers a multitude of options, from the initial consultations, project planning and execution right through to evaluation and maintenance.



Concealed water leak identified



MTU Maintenance Hannover, Germany, is responsible for the maintenance of medium-size and large aircraft engines and is owned by Germany's leading manufacturer of aero engine modules and components. The company is a role model in energy management and network analysis, and for years has monitored the utilities consumption of its

various departments in detail under its own management. FRAKO hardware and software are installed there, and are serviced regularly under a maintenance contract.

Despite this, a water leak occurred that would never have been detected from the monthly readings of the water meter. However, thanks to the energy management system, which provides evaluation data directly to the department manager responsible, a greatly increased consumption of water was identified in an area where no one was working. "The intelligent data analysis by FRAKO's EMVIS 3000 software was crucial to our pinpointing this problem," says Rüdiger Grote of MTU, praising the efficiency of the system.

(image source: MTU Maintenance Hannover GmbH)



Example: sankey diagram showing water consumption (yellow). Marked red, you can clearly see the additional consumption (for example, caused by leakage in the line)

Power supplier billing error exposed

The National Metrology Institute of Germany, generally known by its German acronym PTB, is that country's supreme authority in all matters of correct measurement. At its Braunschweig headquarters and other locations, 1900 employees in some 60 different buildings are engaged in research in diverse aspects of physics. PTB has five FRAKO PQM 1588 Power Quality Manager instruments in operation, linked to numerous data acquisition devices monitoring the flows of electrical energy and water. These instruments record and evaluate the consumption figures. At the institute, however, the primary concern is not so much to conserve energy as to ensure a constant and reliable supply of utilities to the many scientific experiments in progress.

In the course of this internal monitoring program, a serious mistake in the invoicing by the electricity supply company became apparent. The difference between the consumption measured by the instrumentation and that charged by the supplier was such that a sum of 50,000 euros was refunded. As Heiko Seifert, the senior electrical technician responsible for the engineering infrastructure at PTB, testifies, "Using FRAKO measurement and analysis instruments we have recorded and monitored our utilities consumption for decades, and can also quickly identify system load limits. This is vitally important for the stability of our experiments. In this particular case we could recover major costs from the power company."



(image source:Physikalisch-Technische Bundesanstalt)

Summing up

Energy management only offers added value for a company if the technical management are immediately informed of any weak points that are detected. In addition to automated data evaluation, effective alarm management at all levels is therefore a must. As examples, if significant electrical parameters reach critical limits, the site electrician should be alerted by a text message, and the accounts department should receive regular key figure reports for all utilities.

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