Sandvik improves energy efficiency with Metrum products

Sandvik Materials Technology, SMT, has invested in Metrum's measurement system to reduce energy consumption. Awareness of power quality and reactive power, as well as a wider interest in energy efficiency activities, are all positive side effects.

Photo: Lars Bryngelsson, Nordfilm

"We wanted better knowledge of how the energy is used and which losses occur in the process handling," says Lars Lindelöf, Service Manager at SMT. "It's not just a matter of visualizing energy consumption, we also have to understand how it can be reduced."

The department that Lars Lindelöf belongs to works with electrical distribution for all Sandvik companies in Sandviken HQ – Materials Technology, Tooling, Venture and Mining. Similar to an internal electrical power company, they handle all energy measurement and distribute costs based on consumption.

Chose Metrum's products

SMT initially looked at devices that only measure energy but interest soon shifted to Metrum's products that enable measurement of various quantities. Besides power quality, the equipment also measures reactive power, which puts unnecessary loads on electrical lines and transformers.

"Now we also have to pay the grid owner for reactive power, therefore we wanted to be able to charge for this internally," says Lars Lindelöf. "It also creates incentives for reducing reactive power, by for example, investing in suitable equipment."

The Sandviken site has acquired more than 500 measurement instruments from Metrum, most of them Metrum SC instruments but also Metrum PQR. The instruments have been delivered over the past two years and are now installed in the production area shared by all Sandvik companies in Sandviken.

"We now have better awareness of energy usage and can distribute the costs in a way that corresponds to actual consumption," says Lars Lindelöf. "Moreover we no longer have to go around from place to place with portable instruments to measure power quality."

The Customer

Sandvik is an industrial engineering group in tooling, materials technology, mining and construction. Operations are conducted in 130 countries with total annual sales of more than EUR 11 billion (SEK 96 billion).

Read more: **www.sandvik.com »**

Results

- **Increased knowledge** of how electrical energy is used and how consumption can be reduced
- **Capability to identify causes** of costly energy losses
- **Internal distribution** of energy costs
- **Better information** when making decisions about plant modifications and new installations
- **Reduced penalties** from grid owners regarding reactive power
- **Less production down time** due to electrical faults
- **Better equipped** for future energy efficiency activities

System Delivered

Metrum SC

Metrum PQR

Metrum SC/PQ Controller

With measurement instruments from Metrum and a logging system supplied by Affectus, internal energy consumption is constantly monitored. The costs are distributed among the various production units and the system automatically generates internal invoices, forecasts and reports on consumption and power quality.

Major potential for efficiency gains

For the most part, SMT use recycled materials in its metal production. Scrap metal is melted down, mixed and processed to attain the right properties. The products include stainless steel bands and pipes, which are supplied to customers in various industry sectors for further processing. Operations are energy intensive and the combined production facilities in Sandviken consume 600–700 GWh per year.

Over the last few years, SMT has focused on energy efficiency with the objective of reducing energy consumption by 10 percent. Since 2009, they have identified actions that can reduce energy consumption by approximately 52 GWh per year, a savings corresponding to around 3,5 million Euro (SEK 30 million). Several of the actions have been implemented and the annual energy consumption has already been reduced by 20 GWh.

Sandvik's program for energy efficiency

- Current energy consumption: 600–700 GWh per year
- Goal for reduction: 10 percent
- Identified energy-saving actions: 52 GWh
- Implemented actions to date: 20 GWh

With the Metrum SC instruments installed at all high/low voltage switch gear and fuse boxes down to machine level – about 500 measuring points – Lars and his colleagues have information for improving efficiency and following up the implemented actions. Energy consumption at the various units can also be monitored in real-time via a web-based application. According to Lars, the visualization of consumption has resulted in growing interest in energy efficiency. Work with energy conservation continues and a good example of this is idle consumption, in other words energy consumption when production is not in operation.

"Here there is major potential for savings," says Lars Lindelöf. "We have to be better at turning off unused fans, pumps and lighting. Idle consumption for us is an excellent starting point for work with energy savings."

As an example, Lars mentions that the steel plant is not in use, idle, every other Thursday and every other weekend, as well as during the four weeks of the summer vacation period.

"The electrical energy consumed during these periods corresponds to approximately 10 percent of the energy consumed during production. It is entirely feasible to reduce this consumption by half, which would entail substantial savings."

Awareness and monitoring of power quality

Poor power quality in the form of voltage dips and harmonics, causes for example major problems and production down time in the industry. With the help of power quality measuring, problems can be detected and prevented through compensation in the form of filters or capacitor banks.

"Prior to modifications to a plant or installation of new machinery, we know the power quality we have before the change," says Lars Lindelöf. "We can then discuss the new equipment with the supplier and ensure that power quality will not be reduced.

"Increasing numbers of industrial companies are realising the benefits of working with power quality. This entails a little extra investment for including the functionality in the measurement equipment but this is soon recovered through direct savings and increased opportunities for energy efficiency. Based on the successful results in Sandviken, discussions are now underway to continue with more installations at the other company's plants in Sweden.

"For us, power quality measurement has already been very beneficial and with Metrum's system in place, we are better equipped for new goals and initiatives in energy efficiency," says Lars Lindelöf.