

Speed-controlled fan reduces electricity costs by 25,000 euros annually

A case study from Emotron





INEOS saves 25,000 euros per year by controlling the speed of just one fan.

"Drive motor efficiency increased by more than 25 % when the Emotron variable speed drive was installed," explain systems operator Martin Gustafsson and project engineer Ingemar Leckborn.

The process industry INEOS (formerly Hydro Polymers) saves 25,000 euros each year by controlling the speed of one of its fans. The company uses Emotron variable speed drives in several of its electric motor drives, including pumps, fans, mixers, mills and centrifuges. The major benefits are lower energy consumption and a reduction in wear.

Sweden's only PVC production facility

INEOS' facility for the production of the plastic material polyvinyl chloride (PVC) is the only one of its kind in Sweden. It produces 210,000 tonnes of PVC every year. The company has 360 employees and an annual turnover of 200 million euros. PVC is used mainly within the health-care sector for, among other things, gloves, tubes and blood bags, and in the construction industry for pipes, cables, window frames and flooring, for example.

Production involves a chemical process consisting of several stages that ultimately produces a white powder. Pumps, fans, blowers, mixers, mills and centrifuges, controlled by Emotron variable speed drives and softstarters, are all used as part of the process.

Streamlining an energy-intensive industry

INEOS is an energy-intensive industry that can make extraordinary gains by streamlining its production process.

"We consume as much energy as a medium-sized Swedish town. For us, energy is a raw material," says project engineer Ingemar Leckborn.

Areas that could yield potential savings include the numerous electric motor drives. Here, electrical energy can be saved by controlling the speed. The company currently uses a small number of makes of variable speed drives as standard. This ensures a high level of safety, as personnel are more familiar with the equipment. Emotron is primarily used for higher motor powers.

"The main benefits associated with Emotron products are excellent operational reliability and user-friendliness," says Ingemar Leckborn, who is responsible for purchasing and installing control equipment. "The control panel makes it easy for operators to monitor and adjust operating parameters."

A single fan saves 25,000 euros per year

One of the big fans used for drying the PVC powder demonstrates clearly the excellent savings potential that results from streamlining electric motor drives. By replacing mechanical control with speed control, INEOS saves 25,000 euros per year in reduced electricity costs for this one fan alone. The efficiency of the drive motor increased by more than 25 % when an Emotron variable speed drive of 400 kW was installed for control purposes. Previously, the drive motor required 85-90 % of the rated output; today, it uses 60-70 % with the same results, which means an airflow of approximately



Emotron products are used to control items such as pumps, fans, mixers, mills and centrifuges used during the manufacturing process.

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119,000 m³/hour. The difference is due to the energy that was lost when the airflow was controlled using dampers.

PFE spurs industry on to save energy

INEOS was one of the first companies to sign up to the Swedish Energy Agency's programme for improving energy efficiency in energy-intensive industries (PFE). Participants are companies involved in the Swedish manufacturing industry, who are working systematically to streamline their manufacturing processes. Requirements include companies introducing a standardised energy management system, carrying out an energy audit and compiling a list of measures that are then implemented and reported. For any reduction in electricity consumption that can be demonstrated through these measures, the company is granted relief from the tax on electricity of 0.05 cents/kWh. The 100 or so companies who have joined the programme since January 2005 have achieved energy savings of almost 1 TWh. That is more than Sweden's entire electricity consumption for two average days.

Systematic energy work pays off

As part of its efficiency drive, INEOS is looking at both electrical energy and heat. Their energy management system was certified in 2006 and has been implemented throughout the company's general business system, which also covers health, the environment and safety.

Kent Olsson is the electrical manager and also the person responsible for the company's PFE project. He regards it as a positive development for the Swedish government to be giving industry an incentive for energy savings through the PFE programme.

"Tax relief is a carrot for us, but the biggest potential is in the savings we make by reducing our electricity consumption. As an energy-intensive industry, we would have taken measures in any case, but PFE was an important reason for us starting more systematic work," explains Kent Olsson.

Involves operators and designers

The energy audit gives an idea of the flow within the company and indicates potential savings. When it comes to controlling the speed of electric motors, the company has specified a payback period of a maximum of three years for switching from throttle control – the same limit that applies for PFE.

"The trend at INEOS is towards ever larger motor drives and thus more and more systems are benefiting from being speed-controlled," says Kent Olsson.

According to Kent, good results can only be achieved by involving personnel in the project.

"The systems operators must be involved, as it is their day-to-day work that produces the greatest effect. It is equally important for designers and project engineers to consider energy consumption when designing systems."

Dedicated drive

Emotron develops products for starting, protecting, controlling and stopping machines and processes driven by electric motors. Our drive is to create measurable benefits for our customers through reliable, cost-efficient and user-friendly solutions. By focusing on selected applications, such as pumps, cranes and lifts, we can offer functionality optimized for specific needs.

Since 1975 we have established a solid position as an innovative and pioneering company. Research and development takes place at our head office in Sweden and at our subsidiaries in Germany and the Netherlands. Germany is also the location for the Emotron technical centres for lift and crane solutions. We have sales offices in Sweden, Germany, the Netherlands, China and Latin America, as well as a worldwide network of authorized service partners.



Products for your specific needs



Our complete product portfolio offers optimum solutions for your specific needs. The products are all based on the same technology platform and can easily be integrated in complete solutions. Wide power range, high protection class and compliance with global standards mean they fulfil the highest demands.

- *Shaft power monitors* – protect your process from damage and unplanned downtime.
- *Softstarters* – ensure smooth starts and safe stops.
- *Variable speed drives* – minimize energy consumption and wear.



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