

# OPTIMAL USAGE



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The production of stainless steel is energy intensive, yet the consumption of individual plants is difficult to forecast. In order to avoid unforeseen peaks, RWE Supply & Trading GmbH (RWE) has set up a new type of power generation, including a storage facility, at Outokumpu, one of the world's largest producers of stainless steel. Sufficient energy reserves must be available 24 hours a day and deployed without delay. This challenge led RWE to Bachmann.

Energy prices and network charges are major cost drivers in stainless steel production. When roll stands are operating at high capacity, the plant's electricity demand is particularly high, and the grid operator must be able to provide energy at short notice. With the share of electricity supply from renewables increasing, this poses a considerable challenge because the volatility of renewable energy leads to variation in available power in the grid. Furthermore, electricity must be purchased during relatively expensive peak times.

## Intelligent energy management

The innovative power generation and storage system consists of a 3.3-megawatt battery storage system coupled to three 1-megawatt gas-powered generators. During peak times, it supplies electricity – “optimized for the energy market,” says Viet-Dung Pham, Battery Development Project Manager at RWE Supply & Trading GmbH. “If there is too much or too little renewable energy available on the electricity market, additional power can be fed in or production adjusted accordingly.”

## Power demand management on site

Many of the Krefeld-based stainless steel producer's plants run very steadily and therefore have predictable energy requirements. However, for the cold rolling of flat stainless steel products, four large rolling stands are put into operation sporadically, with a startup power alone of 15 to 20 MW. In order to maintain grid-delivered energy below a defined

threshold value around the clock, a sophisticated algorithm is required that continuously forecasts the production plant's consumption, looks for ways to compensate, and reacts accordingly by providing electricity from available sources.

Short-term high energy demand can be met by the battery, and longer lasting demand by the gas generators. If neither of these is sufficient, the power supplier can intervene in the production process at clearly defined points via the controller system, explains Viet-Dung Pham: “Since the energy consumption is essentially proportional to the rolling speed, the feed rate and with it the energy requirement can be throttled if necessary.” Although this extends production times for the output quantity, it is unproblematic for the rolling process. Finally, the plant operator is informed by a message on their control panel that the rollers are being throttled.

## Absolute availability

The top priority was ‘absolute availability’, because the algorithm had to be able to switch energy sources immediately and without delay, explains the project manager. In its search for a controller solution with the corresponding functionality, RWE found what it was looking for at Bachmann. Two MC220 processors operating in hot standby as masters serve 12 further redundantly-coupled gateway processors to control the individual gensets. Real-time communication at RWE takes place via the bluecom



protocol. "This is the ideal topology for us. Parallel CPU operation also makes it possible to update the computing cores securely," says Viet-Dung Pham. "We can adjust the software on one CPU while the second maintains operation. In the event of an error, it is always possible to revert to the previous version."

#### Efficient web visualization

RWE implemented the monitoring user interface with Bachmann's atvise® scada. "I was really impressed," Pham confirms. "The engineering was very simple, because the entire catalogue of Bachmann devices is already fully mapped in the supplied libraries, so you can build a functional solution very quickly."

The plant has been running autonomously and unmanned since the beginning of 2022. Operations monitoring is carried out from the control center of a power plant belonging to the RWE Group. Since then, 'MALIBU (Motor Assisted Lithium Ion Battery Unit)', the plant's internal project name, has been reliably preventing peak loads from entering the grid – saving money for the electricity customer.

#### RWE SUPPLY & TRADING GMBH

- RWE Supply & Trading is the Interface between RWE and energy markets around the world
- Around 1,600 employees from over 50 different countries trade in (renewable) electricity, (green) gas, raw materials and CO2 emission certificates
- The trading company also ensures commercial optimization in the use of RWE power plants and markets renewable electricity.

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