

Forecasting system as a predictive tool to keep energy costs at bay at Arcelor Eisenhüttenstadt



Integrated metallurgical works of Arcelor Eisenhüttenstadt GmbH.



ArcelorMittal

Arcelor Eisenhüttenstadt GmbH is a member of the Arcelor group which is among the world's largest steelmaking groups. Within the scope of Arcelor's global corporate strategy, Arcelor Eisenhüttenstadt is the interface with emerging markets in eastern Europe. The company employs a workforce of 3,000 and as an integrated metallurgical works offers quality products and services from pig iron production to the processing of steel flats.

Energy costs account for a significant share of production costs of steelmakers like Arcelor Eisenhüttenstadt GmbH. As a precondition for serving customers on schedule and at the agreed cost, energy must be supplied at the lowest rates possible and as required for production. Arcelor Eisenhüttenstadt GmbH generates electrical power internally and buys external electricity too. The energy-relevant parts of the company are its power station, the pig iron works, the converter steelworks as well as the hot and cold rolling mills where most of the energy is consumed.

Tasks and aims

The internal power generation demand is currently calculated on the basis of scheduled operations at the power station. This capacity is not enough

to cover total energy demand during full-scale production. This means that additional electrical energy must be bought from the utility.

A forecasting system is to correlate the consumption of electrical energy of the individual plant units of Arcelor Eisenhüttenstadt GmbH with actual production and to use this as a basis for developing energy forecasts for the future on the basis of the production schedule.

The solution

With PSI*metals* EMS (Energy Management System), PSI Metals GmbH provides Arcelor Eisenhüttenstadt GmbH with a forecasting system which considers the consumption of electrical energy. The system pinpoints potential influences

on the amount of power generation and on the amount of externally sourced energy through improved energy forecasts.

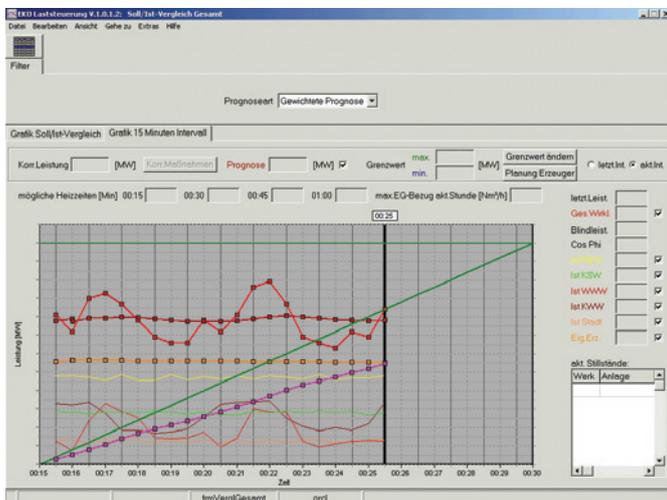
Energy forecasts are calculated for three different time horizons.

Load pattern recognition is used for *short-time forecasts* according to the 15-minute billing cycle. The forecast is to continuously monitor actual energy demand. When the forecast shows that the agreed external supply volume is likely to be exceeded, load reduction measures can be taken, for example, by

PSI*metals* EMS receives its evaluation data from systems which are already in use at Arcelor Eisenhüttenstadt GmbH:

- The telecontrol system supplies the current energy consumption value which is compared to the forecast and adjusted. Changes in time schedule, production changes at short notice and problems are hence included in the forecast.
- The production planning and management (PPS) system which is also implemented by PSI Metals GmbH supplies production-relevant data for a long-term energy consumption forecast.
- The metering system for accounting with the utility determines the actual power consumption values at the end of an accounting period.

In the long term, the system is to enable the most economical acquisition of externally generated energy with minimum intervention in production as a comprehensive, self-learning and self-



Load management: graphic rendering of the total target-to-actual comparison.

switching the ladle furnace off.

The *medium-term forecast* is calculated for a period of two hours. During this period, internal production can be increased or reduced by altering the operating regime of the power station. In this way, load-reducing measures can be prevented well in advance.

The *long-term forecast* covers a period of 36 hours and is calculated from average energy demand values, taking scheduled downtimes into consideration. This forecast can then be used as a basis for a timetable of the expected energy demand to be submitted to the utility the next day.

The benefits

The energy forecasts supplied by PSI*metals* EMS enables a significant reduction in the degree of utilization of the quota of contractually agreed supplies from external sources at short notice. This reduces intervention in production.

The medium-term forecasts serve as decision-making aids for controlling the operation of the power station in order to adapt internal power generation to the production conditions too.

The energy forecasts for the long-term range open up negotiating possibilities, so that full use can be made of liberalized electricity markets.

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