

Industrial demand-side energy management in Mayr-Melnhof Karton



Mayr-Melnhof Karton (MMK) is the world's largest producer of coated recycled cartonboard. As with most industrial sites, energy costs have a significant impact on operations. By using an ABB solution that helps shift energy-intensive process steps to times when electricity costs are low, MMK, Frohnleiten in Austria is realizing important savings.

— Mayr-Melnhof Karton is the world's largest producer of coated recycled cartonboard with an important position in the production of recycled liner and virgin fibre cartonboard.

Every industrial company is aware of the impact of electricity costs. For companies like Mayr-Melnhof Karton (MMK), the world's largest producer of coated recycled cartonboard, these costs play a significant role. Their mill in Frohnleiten, Austria, has a refined mechanical pulp (RMP) line that supplies pulp to two board machines that requires up to 10 MW of electrical power. At 520,000 t/year, the Frohnleiten mill has the highest production capacity in the European cartonboard industry.

The electricity spot price in Austria is highly volatile, so if electricity use can be dynamically scheduled to low-price periods, significant cost savings can be achieved. The required solution needs to adjust to the electricity price, and take all relevant process restrictions and production targets into account. ABB had already supplied Mayr-Melnhof Karton with a cpmPlus History energy monitoring and reporting system (EES) in 2001, so selecting an ABB solution for their energy optimization needs was a next natural step for MMK.

Mr. Panu Karhu, ABB's technical lead on the project, commented, "Our solution exploits real-time process and energy price information, and includes ABB Ability™ cpmPlus Energy Manager system, along with all the relevant project and implementation services."

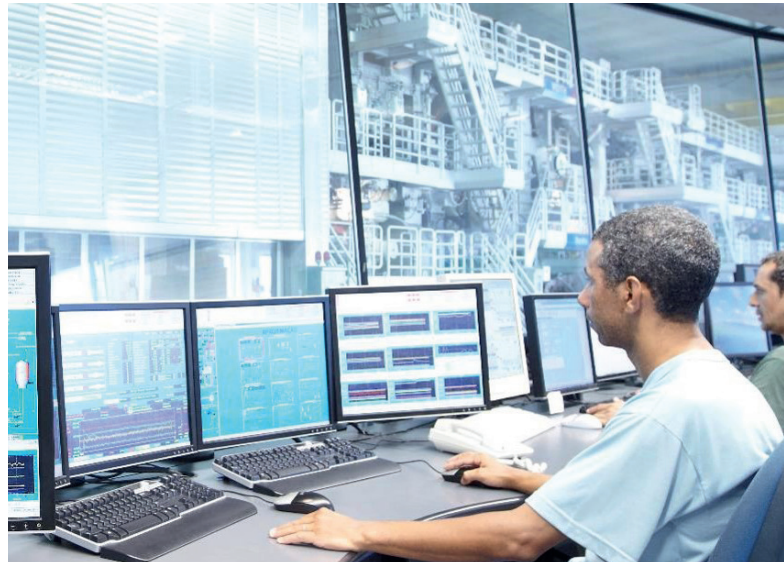
"The process includes a 500 m³ pulp tank between the RMP plant and board machines, which helps provide the flexibility to plan the RMP plant activity in an optimal way. This intermediate storage ensures that neither pulp nor paper production is interrupted or reduced, and in fact is also able to serve as a virtual battery, to be charged and discharged according to the electricity price."

The system was installed on top of the existing EES and started up in December 2017. It visualizes results so the operators can then send the optimized set points to the RMP refiners, either manually or automatically. The solution enables rescheduling of electricity use to low-price periods whenever possible to reduce electricity costs. It also provides an accurate electricity consumption forecast, which may be used for more cost-efficient planning of overall energy use, production and purchase.

Mr. Franz Fuchs, responsible for the automation department at MMK Frohnleiten mill, describes the power supplier situation: "We've been working with ABB since year 2000, when the power market was deregulated. Large power users like ourselves negotiated with suppliers to get the best price. At nine o'clock every morning, we send our forecast for the day's power needs, in specified 15-minute windows, to the supplier. Power needs vary, depend-



Board machine KM3, at Mayr-Melnhof Karton in Frohnleiten Mill.



New opportunities of industrial demand-side management (iDSM) – saving cost with intelligent planning.

ing on the type and quantity of carton board we are making that day. Sometimes there are production alterations, and if we use more than we predicted, that extra power is more expensive, so the support we get from the ABB tool – getting the forecast correct is very important.”

Mr. Tapani Kalkela, ABB’s responsible for the administrative side of the project, sums up the success of the work: “The ABB solution has already allowed our customer to make significant savings in their electricity expenditure. I can see that the same principles will be applied to other mills in the pulp and paper industry and to other industries. Demand-side energy management really does open the door to important energy cost savings!”

Looking ahead, additional functionality for this system will include a streamlined way to add notes to automated reports. This will be very helpful for MMK, as the company built a new biogas plant to provide power for this mill earlier this year, and would like to include the associated lab test data and gas volume statistics from the plant in the official production reports.

“The ABB solution is good. I know companies offering similar products, but in my opinion, the ABB one is the best” Mr. Fuchs concludes.

Mayr-Melnhof Karton is the world’s largest producer of coated recycled cartonboard with an important position in the production of recycled liner and virgin fibre cartonboard. The Austrian Frohnleiten Mill has the highest production capacity in the European cartonboard industry. The Frohnleiten Mill is the leader in the field of food safety. With FOODBOARD™ and FOODCART™, Frohnleiten produces cartonboard solutions with a functional barrier that protects packaged foods from migration (e.g. of mineral oils).

- Production capacity 520.000 t/year
- BM2 = 190.000 t/year, BM3 = 330.000 t/year
- Grammages 230–450 gsm

What has been done?

ABB’s solution iDSM (industrial Demand Side Management) intelligent planning is saving production process costs at MMK Frohnleiten mill – minimizing the electricity expenditure by optimizing the RMP operation according to electricity spot price, and providing power consumption forecast for electricity purchase.