

Effective Management Can Reduce Energy Costs Millwide

By Keith Masters, ABB business manager, pulp and paper systems

Introduction

It's as true in pulp and paper as it is in many other industries: the continued rise in energy prices has put a squeeze on margin and profits. Paper-makers know that to maintain margin, they must effectively manage their energy costs. But many mills struggle to

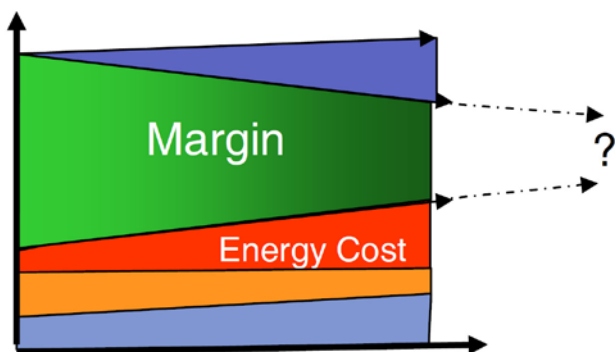


Figure 1 Energy costs impact margin.

find the best ways to reduce what they pay for energy.

Mills can successfully manage energy costs by avoiding price peaks and penalty charges. Other tactics include: using optimal resources to supply electric power; raising plant-wide awareness of energy consumption and its cost; real-time monitoring for early detection of poor performance against set targets; managing electricity purchase prices with accurate consumption plans; and participating in the demand response market.

Software optimizes energy use. An energy management system, such as ABB's *Energy Manager*, is a good investment for tracking and cutting plant (mill) energy costs. Plants using *Energy Manager* typically achieve total energy cost reductions of two to five percent. To qualify a program that works for them, mills should look for software that includes both planning and scheduling tools for optimizing energy

use and supply; energy balance management tools to assist in procuring energy at the best available prices; and reporting tools to help monitor energy consumption, costs and efficiency. It's also essential that programs use real-time system data.

Planning tools are essential for predicting energy consumption and calculating a corresponding energy supply schedule. Software can also balance time-varying energy consumption with supply resources.

Energy Manager monitors power schedules in real-time so that deviations or unexpected events can be quickly detected and reported, thus helping to minimize their costs. The energy planning module automatically recalculates the demand schedule based on changes in process measurements, production plans or user inputs. If an imbalance between predicted power consumption

and planned supply is detected, the deviation may be balanced through additional power trading or automated process control.

The *Power (Tie-Line)* monitoring module predicts total utility consumption within the current billing period by integrating and extrapolating the flow in the tie-line. If the predicted volume exceeds pre-set or calculated alarm limits, alarms will alert the operator to take action.

The system generates reports that help users quickly analyze energy and use. Performance reports can detail everything from the consumption and cost of utilities per hour/day/month/year, to benchmarking and analysis of load profile and peak demand.

Case History Results

Mayr-Melnh of the Carton Board Group. In 2001, Mayr-Melnhof Carton Board Group, an I, international producer of recycled carton board, implemented plant-wide energy management systems at seven of their carton board plants in Austria, Germany, the

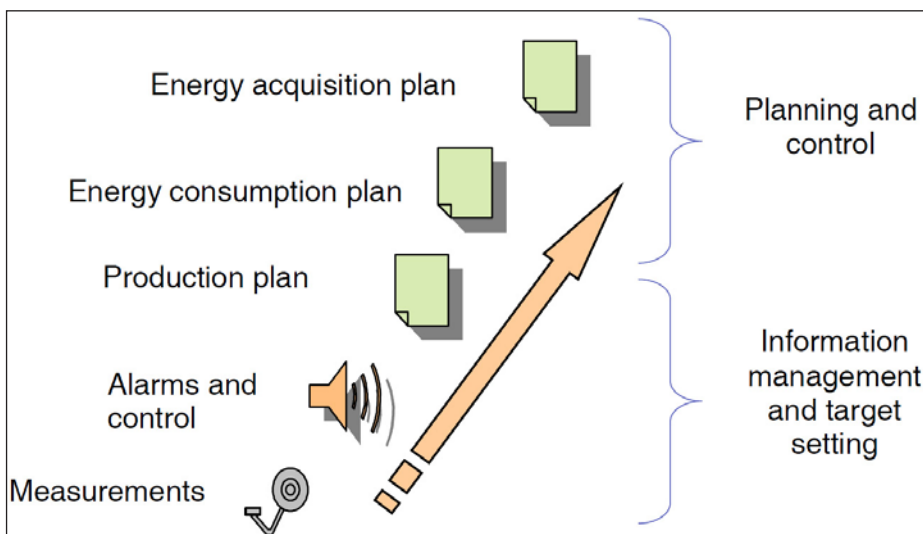


Figure 2 Energy management system functions.

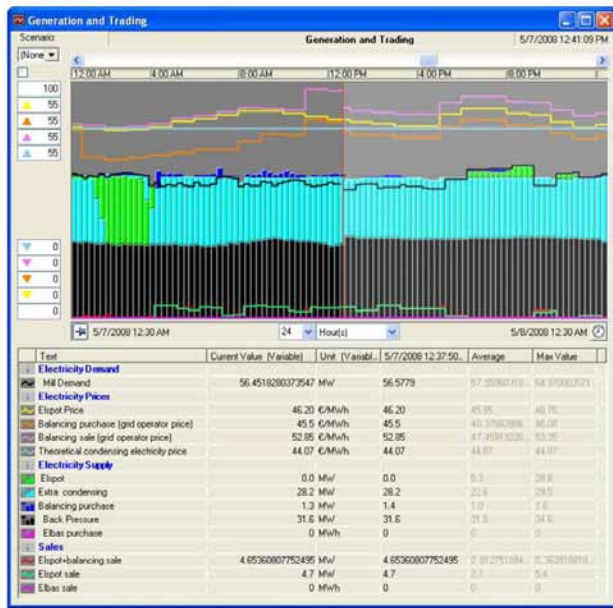


Figure 3 Screen capture example shows how knowing energy demand, prices, supply and sales data can be used to optimize energy resources. This tool is used to balance resources and perform real-time monitoring and predictions.

Netherlands, Switzerland and Slovenia.

Every morning, Mayr-Melnhof uses the ABB information system to retrieve data regarding the events of the previous afternoon and evening. “We use the system to manage energy, water, chemicals, compressed air, production and quality data and statistics,” explains Johan Maier, who is responsible for energy and water management at Mayr-Melnhof. “The *Energy Management* (software) represents our connection between local processes and offices, and provides a handy instrument for optimizing the process and detecting failures more easily. We are happy with the system and have ordered an upgrade this year in order to obtain further benefits.”

Public Works. Public Works Government Services Canada (PWGSC) oversees government assets including office buildings and central heating and cooling plants, as well as high-voltage water and sewage distribution systems that vary in size, complexity and age. Its activities include delivering, verifying, planning and reporting on utilities and different grades of fuel for all of these facilities. PWGSC also deals with many different energy suppliers and energy commodities.

PWGSC found that their multiple budgeting, reporting, billing and planning systems could not effectively manage all the required energy and asset management activities. By adding *Energy Manager*, they could optimize energy costs. The system is capable of collecting real-time data from different energy markets. The *Energy Man-*

ager suite supports analysis of the cost impact of different combinations of electricity and natural gas purchased from different sources. This will help PWGSC negotiate and purchase different energy commodities directly from suppliers.

The availability of real-time energy data generated at different building complexes allows PWGSC to perform benchmark analysis of the performance of their properties. PWGSC now uses a wide range of reports including energy usage and cost for each building. All of these activities add up to energy savings at PWGSC.

Zellstoff Celgar/Castlegar pulp mill, British Columbia. Canada uses monitoring and reporting features to collect both in-plant energy consumption and the local utility (BC Hydro) data in the real-time format. It is a report-rich system that helps management understand the opportunity cost when they do not sell power to BC Hydro.

The main goals of the ABB system are to improve the stability and reliability of operations; maximize net revenues from power sales; reduce energy costs; and improve overall coordination of power plant and pulp mill operations. **PTE**

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