



OPERATORS OPTIMIZE THEIR HEAT RECOVERY SYSTEM

\$600 000
PER YEAR
OF RECURRENT
SAVINGS

SITUATION AbitibiBowater’s Kénogami operation in Jonquière Quebec produces 210 000 metric tons/year of uncoated groundwood and supercalender paper grades on two modern TMP lines and two paper machines. In recent years, the mill has improved their energy situation by investing in their measurement system and by applying good energy practices. The mill also invested in a new heat recovery system, but they wanted to reduce energy costs even more, so they turned to PEPITe for help.

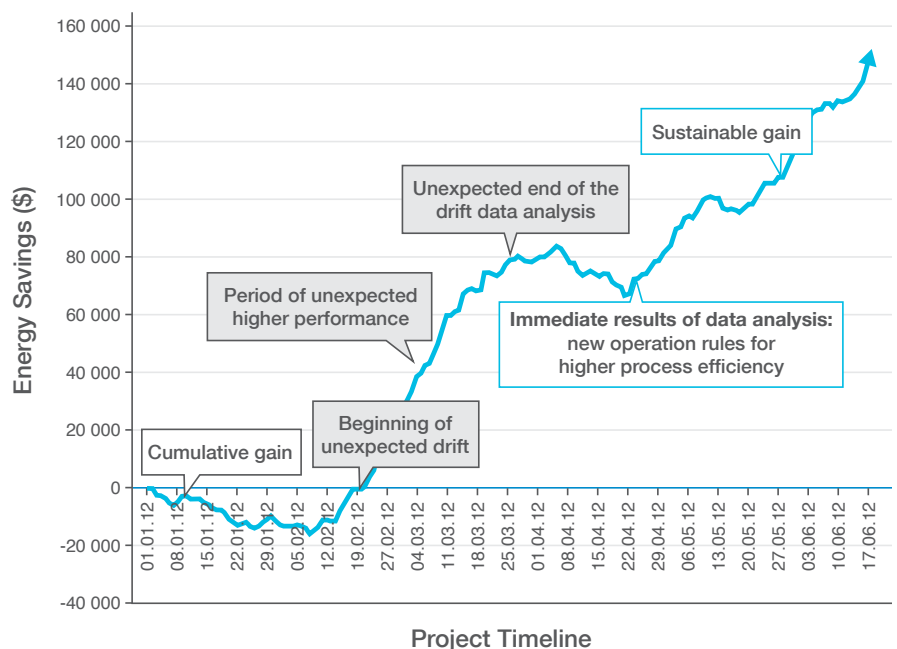
SOLUTION To achieve and sustain higher energy performance, an improved monitoring methodology was implemented at all levels of the mill that involved everyone from operators to the mill manager and also included a support system for troubleshooting. Several different data mining tools, mill knowledge and existing monitoring practices were combined to:

1. Build model-based KPIs.
2. Identify operating conditions that ensure high heat recovery.
3. Develop smart alarms and actions required to sustain high performance.

Models and smart alarms were implemented and operators were properly trained. The mill started to see significant savings immediately.

BENEFITS

- Projected recurrent savings: \$600 000/year without additional CAPEX
- Better understanding of energy cost drivers
- Ability to quickly and objectively explain energy variations
- TMP heat recovery was sustained at a high level, even in winter
- Good return on investment for the heat recovery system



ABOVE Cumulative savings for ENERGYmaestro project.

\$500,000
PER YEAR
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OPTIMIZATION OF PAPER MACHINE STEAM CONSUMPTION

SITUATION A mill producing groundwood paper grades was experiencing high variations in steam consumption per ton of paper on one of their paper machines. This represented a significant extra energy cost and directly impacted the profit margin. The mill then invested heavily in improving the control strategy of the drying section and the variations decreased. Even so, the variations of energy use were still important with consumptions close to 15% above normal and there were no straightforward explanation. As a paper machine involves large numbers of interconnected variables, troubleshooting was difficult and the mill asked PEPITe for help.

SOLUTION PEPITe quickly helped the mill identify the root-causes of variations and proposed an action plan.

1. Performance Gap Analysis where past performance is analysed and improvement target is set according to benchmark
2. Root-cause analysis using input from mill personnel, PEPITe's pulp and paper expertise and data mining technologies
3. Action plan based on the outcome of the analysis.

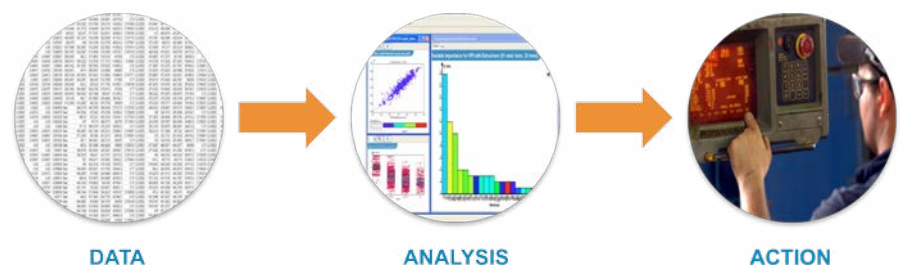
The analysis revealed that among a dozen of possible causes, variations were mainly related to three:

- Problems with the control strategy at lower paper machine speeds
- Increase of make-up fresh water
- Variations in incoming pulp temperature.

A short action list to solve these issues was created

BENEFITS

- Recurrent savings of \$500 000/year without additional CAPEX spending
- Better understanding of energy cost drivers
- Focus on a short list of actions that makes improvement feasible



ABOVE Finding knowledge in data for improved decision making.



KRAFT MILL STEAM COST OPTIMIZATION

5 TO 10%
ENERGY
SAVINGS

SITUATION Through operation improvement, investment and better procurement strategy, kraft mills have become more energy efficient in the past few years and additional energy savings makes a big difference. Due to high level of interactions in the process, optimizing new and existing assets is challenging. Improvement actions and drivers are scattered by process variability and drifts are difficult to detect. Reduction in energy use must also be consistent with boiler base load constraints and power generation. A mill was facing these challenges and asked PEPITe for help.

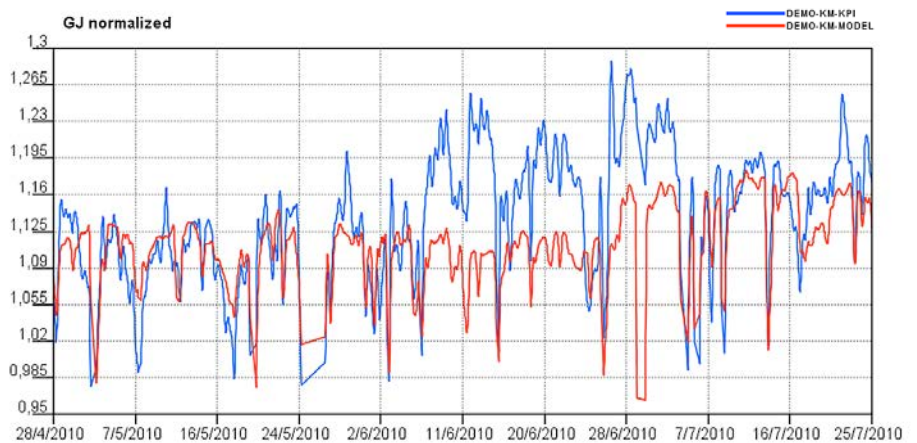
SOLUTION PEPITe provided the right decision tools to increase global energy efficiency:

1. Identification of process improvement opportunities for several key processes and the water system by analyzing historical operation
2. Implementation of monitoring models to detect performance drift and related them with possible root-causes
3. Creation of a steam balance using historical process data to assess power plant capability vs. demand reduction. Including a real-time steam cost model
4. Evaluation of the impact on the utility system including boilers management, fuel mix, power generation and economic trade-offs

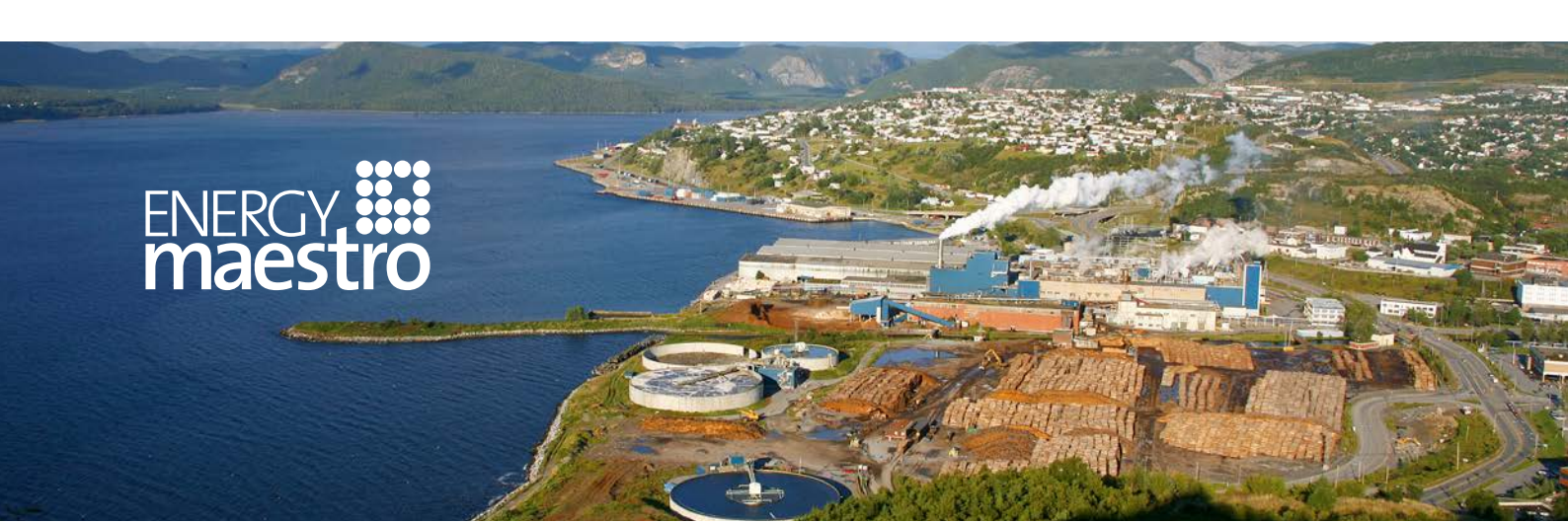
Today, a long-term action list is being used at the mill, and the energy efficiency is continuously improving.

BENEFITS

- Better understanding of key energy drivers and their interactions; improved day-to-day operation and reduced energy costs
- Reduction of vented steam by improved management of steam balance and boiler capabilities while maintaining power generation
- Secure ROI by maintaining high performance of new equipment
- Integration of day-to-day energy efficiency projects in a long term energy strategy



ABOVE Kraft mill steam usage—Actual (blue) vs. Predicted (red)



USING PROCESS DATA TO SAVE ENERGY

SITUATION A large pulp and paper company performs energy Blitz in their mills to reduce energy costs. During a period of two weeks, a multidisciplinary team identifies opportunities, quantifies the potential gains, selects improvement projects, and build an action plan for the implementation. As it is only a two-week activity, it is very important to quickly identify the areas with the highest potential improvement to focus the work. This is where the company asked PEPITe for help.

SOLUTION By exploiting historical process data, PEPITe is able to quickly provide facts about energy users and drivers and help make the Blitz more effective.

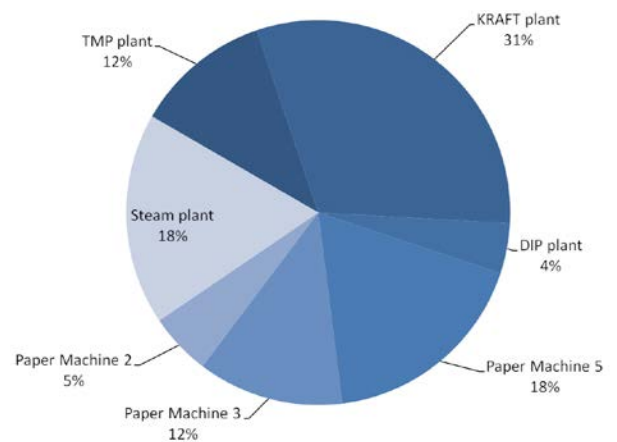
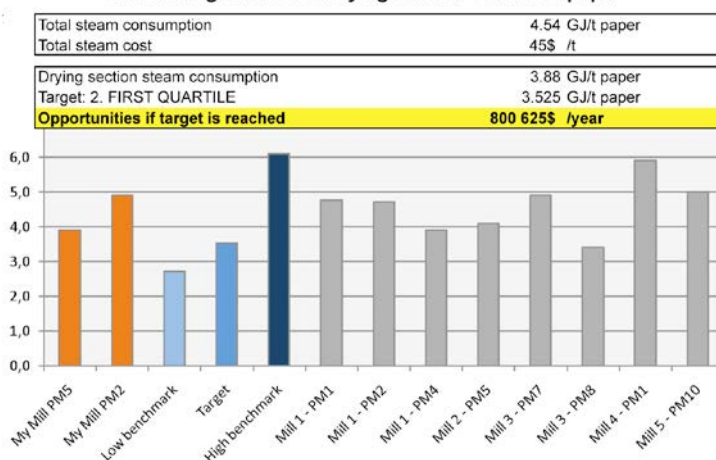
1. Before the Blitz, by completing a self-assessment tool the mill has a list of their biggest improvement opportunities. Mill people enter basic operation data and targets based on benchmarks. The tool automatically calculates Key Performance Indicators (KPIs) and associated potential savings.
2. During the Blitz, a performance gap analysis is done where PEPITe's pulp and paper experts analyse KPIs using historical data. As opposed to traditional "snapshot" audits, where at the most monthly average values are used, the variability of historical data bring considerable more insights in term of potential energy reduction.

BENEFITS

- Accelerate a continuous improvement process by focusing on the biggest and most attainable opportunities
- Start the improvement and problem solving activity based on facts
- Reduce risk through more accurately calculated business cases
- Involve mill personnel to ensure their ownership of the results

5 TO 10%
ENERGY
SAVINGS

Steam usage at the PM drying section - GJ/mt of paper



ABOVE LEFT Paper machine assessment **ABOVE RIGHT** Savings opportunities per area