

Case study

# Minas Basin Pulp & Power Company

Hantsport, Nova Scotia



## Heat recovery technology enables growth, with sustainability

Founded in 1927, Minas Basin Pulp & Power Company is a family-owned and operated company that produces 100 percent recycled products such as linerboard and coreboard. The company constantly strives to improve the quality of its paper while reducing its impact on the environment. Focused on growth, with sustainability, Minas Basin engaged Johnson Controls to implement waste heat recovery technology at its paperboard mill, reducing its energy consumption by 25 percent and increasing production throughputs.

Environmental stewardship is built into the company's corporate policy, which states that it will meet or exceed all environmental standards and regulations. Through its efforts, Minas Basin was the first mill in Nova Scotia to be in total compliance with all Federal Pulp and Paper Effluent Regulations. The company's recycling reduces the need for approximately 10.8 million cubic feet of landfill space each year, making it the largest Canadian recycler east of Montreal.



The industrial drying processes Minas Basin uses in pulp and paper production are very expensive due to the significant amount of energy consumed to produce steam. Through a performance contract with Johnson Controls, the company applied waste heat recovery technology to its dryer exhaust systems to significantly lower production costs and improve return on investment, while further reducing emissions in keeping with its environmental stewardship. Under the terms of the performance contract, energy and operational savings resulting from the new technology will pay for the infrastructure improvements.

Through recycling and environmentally responsible manufacturing efforts, Minas Basin is reducing the greenhouse gas emissions of the world by 270,000 tons every year. This reduction is equivalent to sparing 1.5 million trees, saving 580 million gallons of water and preventing 250,000 cubic meters of landfill volume each year.

## Developing a comprehensive solution

Johnson Controls conducted a full-scale energy audit on Minas Basin's plant in Hantsport to fully identify the company's energy and operational needs, develop a solution and identify the level of savings that could be expected. The audit involved multiple site visits, discussions with Minas Basin operations personnel, reviews of Process Control System data, paper machine and process related documents and drawings, dryer exhaust measurements, and monitoring of exhaust and water temperatures. A third-party engineer was hired to measure and confirm the data collected during the audit.



From the audit, Johnson Controls concluded that there was 28 mm BTUs/Hr above 90 degrees Fahrenheit available for reprocessing through the use of heat recovery technology. In addition, this available heat energy could be used to generate water with a temperature between 135 and 145 degrees Fahrenheit for use in industrial processes and plant heating.

Unlike conventional heat recovery technologies requiring a dedicated piece of equipment for each exhaust, the system Johnson Controls installed for Minas Basin uses a single heat recovery unit to handle multiple exhausts. This means a lower initial investment, lower operating costs and a higher return on investment.

The recovery system distributes waste heat through heat exchangers back to the mill's production process and auxiliary systems that consume steam. The system's unique, direct contact design enables optimal recovery of both dry and wet heat, even in varying operating conditions. As a result, up to 90 percent of the heat normally lost through the paper machine dryer exhaust is recycled.

## Operational and environmental benefits

Johnson Controls operates, monitors and maintains the waste heat recovery system, which is guaranteed to deliver more than 100,000 mm BTUs annually over the three-year performance contract. Minas Basin is able to reprocess enough waste heat to reduce energy consumption by 25 percent, which is worth approximately \$1 million annually.

In addition to the heat recovery benefit, this technology is expected to result in the reduction of 92 tons of sulfur dioxide, 8,350 tons of carbon dioxide and 16 tons of nitrogen. Thus the technology can help achieve Kyoto targets and create significant environmental benefits for the surrounding areas. These pollutant reductions also generate certifiable emission credits for Minas Basin valued at \$180,000 per year.