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Through recycling and environmentally responsible manufacturing efforts, this pulp and paper mill is decreasing annual greenhouse gas emissions by 270,000 tons. That equates to sparing 1.5 million trees, saving 580 million gallons of water and preventing the addition of 250,000 cubic meters of landfill volume every year.

Minas Basin Pulp & Power Company is a family-owned and operated company that produces 100% recycled products, such as linerboard and coreboard. Founded in 1927 in Hantsport, Nova Scotia, 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 paper machine exhaust heat recovery technology at its paperboard mill, reducing its energy consumption by 20% 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. Minas Basin was the first mill in Nova Scotia and one of the first in Canada to totally comply with all Federal Pulp and Paper Effluent Regulations. It was also one of the first to use a 100% recycled fiber in production. 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.

In light of the large amount of steam energy consumed, the product drying process at Minas Basin is quite expensive. Through a performance contract with Johnson Controls, the company achieved another industry first, applying an innovative heat recovery technology to its dryer exhaust system to signicantly lower production costs and, in keeping with its environmental stewardship, reduce emissions. Energy and operational savings resulting from the new system pay for this infrastructure improvement.

Developing a comprehensive solution

Johnson Controls conducted a full-scale energy utilization audit on Minas Basin's plant and developed a technical solution including a guaranteed level of savings that would be achieved. 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 volume, temperature and humidity measurements and monitoring process water temperatures.

Upon completion, the audit revealed that there was 28 mmBTU/hr available for reprocessing. Based on a detailed energy balance, a system capable of recovering 18mmBTU/hr was chosen as the optimal application. The recovered heat energy is used to generate water with temperatures between 135 F and 145 F for use in industrial processes and plant heating.

The system distributes recovered heat through heat exchangers connected to the mill's production process and auxiliary systems that previously consumed steam. The system's direct contact design enables optimal recovery of both sensible and latent heat, even in varying operating conditions. The technology is capable of recovering up to 85% of the heat normally lost through the paper machine dryer's exhaust.

Operational and environmental benefits

Johnson Controls monitors and maintains the waste heat recovery system, which is guaranteed to deliver more than 89,000 mmBTUs annually over the three-year performance contract. The solution is able to reprocess enough waste heat to reduce Minas Basin's energy consumption.

In addition to the heat recovery benefit, this solution causes a reduction of 92 tons of sulfur dioxide, 8350 tons of carbon dioxide and 16 tons of nitrogen, helping achieve Kyoto targets and create significant environmental benefits for the surrounding areas. These pollutant reductions also generate certifiable emission credits for Minas Basin. **MT**

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