

by John Nicholson, M.Sc., P.Eng.

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Simply Elementa(I)

Sault Ste. Marie's co-venture into waste-to-energy

One of the main challenges for any new environmental technology company is finding that first customer willing to test it at full scale. The success of a start-up company often hinges on the success of its first full-scale demonstration. In Canada, finding that first customer is often a challenge given the cautious nature of Canadian culture. Compared to other societies, Canadians are not known risk takers.

The Municipality of Sault Ste. Marie in Northern Ontario has broken the mold of conservatism and ventured with a waste-to-energy (WTE) company in a project that may result in a payoff for residents.

Elementa Group

Elementa Group, formerly Enquest Power, was incorporated in 2003 by its founder Jayson Zwierschke. The Canadian based company is located in St. Catharines, Ontario. The WTE technology developed by Elementa is a combination of patented and proprietary technologies. Municipal solid waste is gasified into synthetic gas ("syngas") in an oxygen-deprived environment within a sealed, indirectly heated rotary kiln.

The advantage of gasification-type technologies is that there are no combusted-related generation of dioxins and furans. Also, NO_x and SO₂ pollution associated with incineration does not occur. Elementa differentiates its technology from conventional gasification because its process is actually steam reformation — a technology used for other purposes that Elementa adapted to break waste into its molecular components.

Sault Ste. Marie

Affectionately referred to as "the Soo", the northern Ontario City of Sault Ste. Marie has a population of 75,000 people. Its core industries include steel making (Essar Steel Algoma) and forestry (St. Mary's Paper).

Unbeknown to most, the Soo calls itself the "Alternative Energy Capital of North America." It's a mantle adopted by city council at the request of Ward 1 Councillor Steve Butland. The city's claim to the title is justified by its 126-turbine wind farm, 16 MW solar farm (to be commissioned shortly), use of cogeneration at the local steel mill, and use of biodiesel in municipal transportation fleet.

Approximately four years ago, Elementa Group approached Sault Ste. Marie to discuss its technology. At the time the city was undergoing an environmental assessment for disposal of municipal solid waste. City officials agreed to provide Elementa Group a portion of land at the mu-

nicipal landfill to build a pilot facility. With \$3.4 million in funding from Sustainability Development Technology Canada, the company built a three-tonne-per-day pilot facility on city land to process municipal solid waste.

The city sees the relationship with Elementa as a progressive move that could add to its commitment to alternative energy while solving a waste problem. The Elementa process results in the production of 1.7 megawatt hours of electricity for every tonne of waste processed.


The city carefully weighed the risks associated with working with a start-up company including some internal skepticism of WTE technologies in general and initial opposition of local environmentalists.

There are a number of potential payoffs for the Soo if the pilot facility is a success. The city has benefited from some promotion and marketing simply because groups from Australia, Europe, and the U.S. have visited to see the facility. Also, the city will receive royalties on future sales as a "thank you" from the company its first big break.

Discussions are already being held between Elementa Group and the city about the construction of a 25,000 tpy facility to handle all of the municipality's residual solid waste. If the commercial facility is built, it'll be owned and operated by Elementa Group and the city will pay a \$60 per tonne tipping fee.

"We've received great help from the city of Sault Ste. Marie to get a start on promoting and demonstrating our technology to the world", says Kate Schappert, spokesperson for Elementa Group.

Steve Brutland, the councilor who pushed for the pilot facility, says, "The WTE facility is in keeping with our vision of being the alternative energy capital of North America. We understood the risks associated with project and have worked hard at communicating with the city's residents and ensuring transparency on the decisions we've made."

John F. Kennedy once said that there are risks and costs to a program of action, but they are far less than the long-range risks and costs of comfortable inaction. The mayor, council, and city staff of Sault Ste. Marie are to be commended for working with Elementa Group in finding innovative solutions to allow for the demonstration of promising technology. 

Editor's Note: We will report detailed technical results from Elementa Group's system in a future edition of this magazine.

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