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Turning garbage into power

CHRISTOPHER MAUGHAN

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The last time Rod Bryden got this much attention, he was trying to save the Ottawa Senators from bankruptcy. Now, he's trying to save the planet.

The Ottawa entrepreneur and chief executive officer of Plasco Energy Group will be opening a new waste-processing plant for a two-year trial run early next month in Ottawa: The Trail Waste Facility will vaporize garbage and produce electricity, with relatively low emissions.

Plasco's technology is attracting attention in the Greater Toronto Area, where waste management is an ongoing issue. The regions of York and Durham are watching the pilot project with interest, now that they have started evaluating technologies for a shared waste-processing plant to be built by 2009.

"We're all quite keen to see what happens in Ottawa when they turn the plant on," says Clifford Curtis, commissioner of works for Durham Region.

Toronto Mayor David Miller and many city councillors have opposed thermally based technologies in favour of landfills, recently spending \$220-million to buy Green Lane, a landfill site near London, Ont. However, a citizens committee - the Community Environmental Assessment Team - is in the initial stages of exploring future waste-management options for Toronto.

And all the options for their 2009 recommendations are still on the table, says Geoff Rathbone, Toronto's acting manager of solid-waste management.

Incineration is a dirty word in the city of Toronto. But Plasco's "plasma-arc" technology is not the same as incineration, although high heat is used to break down waste. There's no fire - Plasco treats its waste in a special, oxygen-free chamber, using heat between 3,000 to 8,000 degrees Celsius, generated by plasma torches.

Because of the lack of oxygen, the waste breaks down into a concentrated, hydrogen- and carbon-monoxide-based gas that is cleaned, cooled and used to create energy. The excess heat is reused to help turn more garbage into fuel.

Mr. Bryden says that means his plant is clean, unlike the older big polluters Ontarians may remember. "In incineration, they add a large amount of oxygen to make sure the combustion is completed, so then you get this enormous volume of exhaust that they have to clean," says Alisdair McLean, one of Plasco's chief engineers.

Over its two-year pilot operating period, Plasco's \$32-million plant will process 85 tonnes of garbage every day (including 10 tonnes per day of high-carbon municipal waste - that is, non-recyclable plastics). That should produce about four megawatts of electricity that can be delivered to the grid - enough to power about 3,600 homes.

Further, the Plasco facility doesn't need a smokestack; its carbon-dioxide emission levels, Mr. McLean says, are about the same as those of a natural-gas plant. The waste-conversion system also produces a byproduct called slag, a material that Mr. McLean says can be reused in construction. The claims may sound incredible, but they seemed feasible enough to persuade the federal government to invest \$6.5-million in his project. An additional \$4-million came from the province. Mr. Bryden, 66, is a former law professor who gets credit for keeping the Sens alive when he bought the team from Bruce Firestone. A big-picture guy, he has now got high hopes for Plasco and the cost benefits to municipalities.

"The tipping [dumping] fee will always be less than what the community would have paid [for other options]," Mr. Bryden says. "Right now, what that means in Canada is a price range of \$50 to \$75 a tonne."

That's about half of what it costs the Region of Peel to drop off trash at its incinerator. The City of Toronto pays a similar price to dump garbage at landfill sites in Michigan. At the Green Lane landfill, the figure is reportedly \$40 a tonne.

Andy Campbell, York Region's director of waste management, says Plasco shows promise; he has seen similar technology used in Japan. "They have plants in residential areas that would all meet Ontario's guidelines. ... What that shows is that modern thermal technology does work," he says. Mr. Campbell says it's too soon to tell whether a Plasco plant would be an ideal solution for his part of the GTA. But he has been in contact with Plasco executives, and York Region officials have visited Ottawa to get a first-hand look at the technology. "Hopefully it works, and at the price [Mr. Bryden] is saying it will."

Durham's Mr. Curtis is less optimistic about the tipping fees, saying, "I'd be very surprised if they wouldn't be in the \$100 neighbourhood or higher."

In fact, a recent assessment for a proposed thermal plant in Hamilton put the cost of dropping off garbage at an incinerator or a Plasco-style "gasificator" at as much as \$168 per tonne. In Japan, the average fee is \$200 a tonne.

The cost of the tipping fee hinges on how much generated power the thermal station has to sell. "We know for certain that there are virtually no emissions into the atmosphere, but what's less certain is that we'll get the amount of power we can expect," Mr. Bryden concedes.

The tipping fee is also influenced by the price at which Plasco will be allowed to sell its power. If the power can be sold as "green energy" for a higher price, Mr. Curtis says, the tipping fee might remain affordable.

"Municipal waste is specifically excluded from the standard green-energy agreements because a lot of it is not renewable, but we'd love it if they could still manage to get green credits for this," he says.

Dave Merriman, an environmental consultant working on the York-Durham plan, says he's not sure a Plasco plant would be cleaner or more energy-efficient than the most modern incinerators. But he is convinced that Plasco's emission levels will be safe, despite new legislation that allowed the company to skip part of the environmental-assessment process because it is a demonstration plant.

"Their [gas] cleaning technology is well proven," he says. "... Many people are concerned with emissions and health implications, but personally I'm not."

On the other hand, Rod Muir, a waste-diversion campaigner with the Sierra Club of Ontario, says that even though Plasco claims to have low emissions, the thermal option presents too much of a health risk compared with alternatives such as landfills.

Whether or not plasma-arc is an option for York-Durham remains to be seen.

First, there's the question of scale: Plasco's Ottawa plant will process a maximum of 31,025 tonnes annually. It's too early to determine whether the technology could handle the minimum of 250,000 tonnes a year that York and Durham are planning for.

Second, York-Durham is set to issue a contract by mid-2008, halfway through Plasco's trial run in the capital. That may not give the company enough time to prove itself.

"Plasco doesn't have a track record yet. It's exciting technology ... but we're reserving judgment," Mr. Curtis says.

Plasco in a nutshell

Plasco Energy Group has a proprietary plasma gasification process (PGP) that converts municipal solid waste into an energy-rich fuel, or "syngas," and a commercially useful, inert solid, or "slag." Plasco's energy-recovery system is the result of 30 years of development with plasma technology and more than 20 years of experience applying plasma technology to solid waste and energy recovery. The company has operated a PGP pilot plant since 1986. In 2003, the facility was moved to Castalgalli, Spain.

A Western rival

Calgary's Alter Nrg has acquired a plasma gasification technology that can vaporize old boots, beds and baby diapers. Alter Nrg, which started trading on the TSX Venture Exchange on April 17, purchased Pittsburgh's Westinghouse Plasma Corp. for \$29-million (U.S.).

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