

From garbage to green energy

by Lindsay Ames

Communities around the world are becoming increasingly concerned about the impact of municipal waste on the environment and their budgets, and they are turning to new technologies to replace existing methods.

AS THE WORLD'S population continues to grow, demanding more energy, resources, and space, the need for sustainable solutions is pressing. Mass consumption is leading to ever increasing amounts of waste and the ways in which we dispose of our leftovers is outdated and inefficient. Burning or burying garbage causes detrimental effects to our environment, contributes to global warming, and recovers little value from waste. The push for environmentally friendly solutions is rising and governments are pursuing strategies, methodologies, and actions that promote sustainability.

This movement has inspired many companies to design systems that can process waste in an environmentally friendly manner, including Plasco Energy Group. This private Canadian company based in Ottawa, Ontario has developed a unique waste conversion process that turns garbage into saleable products including electricity and construction aggregate. Working under the unique business model of financing, building, owning, and operating all facilities themselves, Plasco offers

municipalities and communities a low risk solution and new option to their waste management planning.

The company's conversion system is the result of over thirty years of research and development in waste conversion systems using plasma technologies. Decades of testing and design have been invested to develop breakthrough



performance both economically and environmentally. Plasco's patented process allows it to achieve the highest energy yield of any waste conversion technology presently being

Summit: Canada's magazine on public sector purchasing

4th annual Green Procurement special

used on a commercial-scale while keeping harmful emissions at or below the toughest environmental standards in the world.

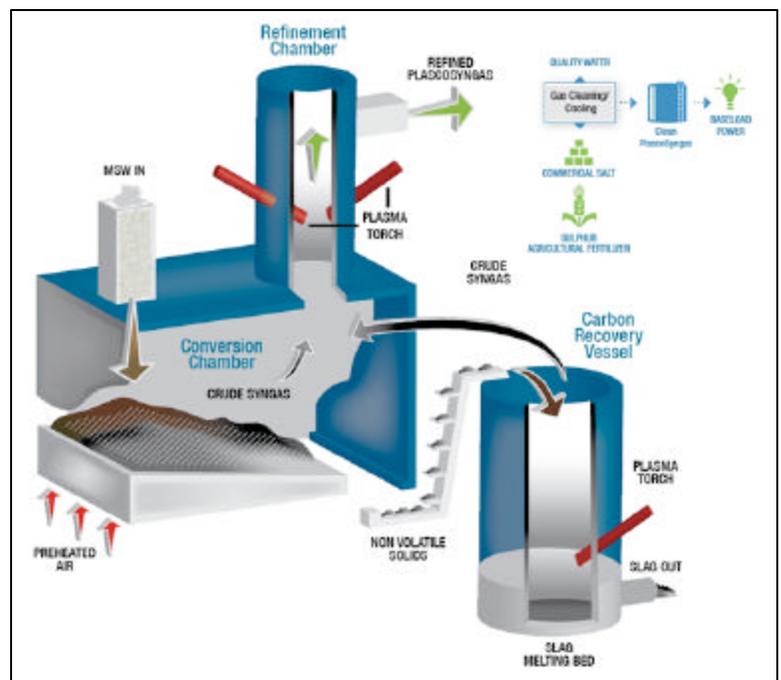
This new solution is currently being evaluated and refined at Plasco's commercial-sized demonstration facility in Ottawa, Ontario. The facility is a joint project between the City of Ottawa, who provides the post-recycled waste and the site and Plasco Energy Group, who owns and operates the state-of-the-art plant. The installation at the Trail Road facility safely converts up to 85 tonnes of waste into electricity and other useful products each day.

This conversion of waste represents a 99.8 percent diversion from landfill with no air emissions during the conversion of the waste to synthetic fuel gas. The synthetic fuel gas (syngas) is then used to run high efficiency internal combustion engines to produce electricity, with recovered heat used to operate combined cycle generation. It is important to note that the Plasco conversion system is not an incinerator – the breakdown of the waste occurs in the near absence of oxygen, which is required for incineration.

The waste conversion process begins with municipal solid waste (MSW) being trucked to the facility and dumped on the tip floor of the enclosed MSW storage building. Large metal objects and materials with high reclamation value are removed from the waste stream and collected for recycling. Once these high value products are removed, the MSW is shredded and any remaining ferrous materials are separated and sent for recycling. Though sorting is not required, Plasco understands that some materials are better off being recycled and is committed to working with communities to achieve their recycling goals.

The MSW stream enters the conversion chamber where the material is gasified using recovered process heat. The crude gas flows to the refinement chamber where plasma torches are used to refine the gas into a cleaner, lighter syngas.

Now refined, the syngas is sent through a gas quality control suite to recover sulphur, remove acid gases and segregate heavy metals often found in the waste stream. These heavy metals are the result of improper disposal of items like batteries and energy efficient light bulbs, representing the only material that cannot be diverted from landfill. The result is a clean, energetic syngas created from the conversion of waste with no air emissions. The synthetic gas is then used to fuel internal combustion engines that generate electricity. This electricity is sent to the local grid – relieving some of the pressure from the provincial transmission grids.



The material that will not gasify (solid residue) from the initial conversion chamber is sent to a separate high temperature carbon recovery vessel (CRV) equipped with a plasma torch where the solids are melted. From the CRV, the liquid slag pours into a water bath where rapid cooling creates small slag pellets. This vitrified residue is an inert, clean aggregate product. Leachability tests have been conducted on slag emerging from the process and have confirmed that the slag does not leach and is non-toxic. The above process is continuously monitored by a proprietary control system that ensures sufficient

syngas stability to fuel the internal combustion engines regardless of the variations in the energy content of the MSW.

The Plasco Trail Road Demonstration Facility in Ottawa has successfully generated electricity from PlascoSyngas and created aggregate suitable for construction purposes. The day-to-day operations have also provided Plasco's engineering team with the information and data needed to design commercial facilities. Building and operating a commercial-scale has been an invaluable learning experience for Plasco with many mechanical revisions and infrastructure upgrades over the past two years. Throughout this technological learning curve, however, the core technology has always performed to expectations.

Plasco looks forward to developing Plasco conversion systems in other municipalities in the near future. Contracts have been signed with Red Deer County in Alberta and contract discussions for a 400 tonne per day processing facility in Ottawa are underway. The company is also working with communities in the Caribbean, California, and the UK, as many growing cities face energy and waste management challenges that Plasco Energy Group can help solve.

Plasco facility designs will reflect the community's architecture, fitting seamlessly into

Lindsay Ames works as a marketing coordinator at Plasco Energy Group. A graduate of the Telfer School of Management at the University of Ottawa, Lindsay holds a Bachelor of Commerce in Marketing. She can be reached at lames@plascoenergygroup.com



the local surroundings and will require a small land footprint. Managing waste no longer has to be an eye sore or an odour problem and the plants will be built to minimize truck traffic, emissions, and odour problems. Plasco will also employ local companies and people to help build, maintain, and operate the facilities, encouraging sustainable economic, and technological growth while protecting the environment.

Plasco facilities will be constructed at the Plasco assembly and manufacturing plant that is currently being designed and will be built in Southern Ontario. This plant will ensure the consistency and reliability of the systems through extensive quality control of the manufacturing process.

Cities around the world are waking up to the realization that burying and burning waste are outdated solutions – the next generation of waste management is clean, green, and efficient. For more information on Plasco's technology visit www.plascoenergygroup.com. 