

Sustainable Conversion Technology Solution for Municipal Waste Management



Raymond Floyd - CEO

About Plasco Energy Group Inc

Plasco Energy Group Inc. is an innovative technology company based in Ottawa, Canada. Plasco's conversion technology is a sustainable solution that helps communities achieve their landfill diversion and renewable energy goals. Plasco recovers the highest value from post-recycled waste and significantly reduces the negative impact waste has on the environment.

Plasco currently operates the world's only commercial-scale conversion technology facility that converts waste into a synthetic gas that fuels GE Jenbacher engines to generate electricity.

The Plasco Conversion System is the result of over 30 years of experience with plasma technologies. Decades of research and development have been invested to develop breakthrough performance both economically and environmentally. Since 1986, we have operated research facilities in Ottawa and Spain where our process has been continuously tested and refined.

More than \$390 million of equity capital has been committed to Plasco since 2005. In addition, public investment includes a \$9.5 million grant from Sustainable Development Technology Canada (SDTC).

Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine

CEOCFO: Mr. Floyd, you have a long history in the industry and have been recognized with many awards. What has attracted you to Plasco Energy Group and why is it the right place for you at this time?

Mr. Floyd: If you are familiar with my history, you will know that essentially all of my history has been with the world's largest organizations. What attracted me to Plasco was the opportunity to work in a different part of industry that I had not previously experienced, and certainly a startup company fulfills those needs.

CEOCFO: What is the concept behind Plasco?

Mr. Floyd: Plasco is a really interesting organization. There is an overwhelming global need for a clean and economic solution to the issue of municipal waste management, and answering that global need is Plasco's mission. The world has an enormous amount of waste from a variety of waste streams, including municipal waste, the sort of the things that you and I throw out at home; construction and demolition waste, the sort of things that general contractors dispose; and institutional and industrial waste, arising from other commercial sources.

There is just an enormous amount of waste today; and waste grows directly with population. Waste grows even faster with improvements in the standard of living. In the developing countries the demand for waste destruction is growing much faster than it is in North America. At Plasco we have developed a truly excellent technology that destroys waste. Importantly, our process destroys heterogeneous waste, so we literally take unsorted waste from any source and destroy it. Depending on the gross energy content of the waste that we receive, we produce usable net energy in a quantity that will produce a nice return on the investment of owning a Plasco asset in almost any jurisdiction. The Plasco process takes the pollution of landfilling waste out of the land, out of the air and out of the water, and simultaneously we produce enough revenue to pay for providing that service.

CEOCFO: As close to layman's terms as you can get, how does the process work? What have you figured out at Plasco that others have not?

Mr. Floyd: The interesting part of Plasco technology is that we believe it is both cleaner and more efficient than other options for municipal waste management. In most circumstances, municipal waste goes into landfills. Landfills pollute the land, air and water and permanently destroy the value of the land. Alternatively, waste gets incinerated. Incinerators burn the waste, and in the process, they create a lot of smoke, dioxins, furans and other things that you do not want in the air.

With sufficient money you can clean up the incinerator smoke stacks, and there are people who are today building fairly clean incinerators, but at a high cost. With incineration, the heat of combustion is used to boil water and produce electricity from steam turbines, a relatively ineffective use of the energy in the waste.

The interesting thing about the Plasco technology is that we do not burn the waste. We heat it in a non-oxygen atmosphere. In our process the waste does not burn, but the volatile energetic molecules flash off. There is some residual energetic material that is not volatile, and we strike that with the plasma arc to release additional energetic material in a different way. Because we do not burn the waste we do not produce smoke. Because we operate at a relatively low temperature we do not produce dioxins or furans. We produce an entirely smoke-free, non-polluting stream of energetic gas that we refine, cool and use in engines to produce electricity. The Plasco process releases more gross energy from the waste and uses it more effectively to produce more net electricity. In two different ways, our process is more efficient; and the most valuable part of our process is that it is much cleaner. These differences enable our technology to be used much closer to cities, reducing transportation and handling costs and pollution as well.

CEO CFO: Who is using your services today?

Mr. Floyd: At this moment, we are still a pre-revenue organization. We have a contract with the city of Ottawa to build a waste-to-energy plant here that we anticipate will commence production in 2016. We also have agreements, not yet binding contracts, for construction of multiple Plasco plants in the city of Beijing and multiple plants in the city of London. Right now, we are progressing those agreements to contract, although as I said we do not yet have those contracts. We have other communities that are anxious to get our technology once we have our first one in operation. There is always a shortage of people who want to build the first one.

"There is an overwhelming global need for a clean and economic solution to the issue of municipal waste management, and answering that global need is Plasco's mission."

- Raymond Floyd

CEO CFO: Is the geographic diversity deliberate or more opportunistic?

Mr. Floyd: It is probably more opportunistic in that we are responding to customer needs first. The plant in progress for the city of Ottawa is within 700 meters of our existing base of experience and expertise, so we are confident that we can make our first plant here a very visible success. In Beijing, their household waste has enough energy content so that destroying a ton of garbage will replace burning a half a ton of coal. Beijing produces 19,000 tons a day of garbage. When we process that for them, they can stop burning 10,000 tons of coal. Plasco technology will help Beijing destroy their garbage and also help with air quality. Beijing represents a customer that openly needs us, and we have truly excellent relationships there based on the mutuality that we need a customer of their size and they need somebody who can do what we do.

The relationship in England is purely economic. The British government has been very forward thinking in terms of getting rid of landfills and incinerators. As a result, they have established very high rates for diverting waste from landfill and incineration along with equally very high fees for electricity produced from biomass or biogenic materials that would have otherwise gone into landfill or incineration. On both sides of our process, they have established very good economics for a business like ours.

CEO CFO: Most companies and most people do not really believe it until they see it, but when you are talking with a prospective customer is there an aha moment when they realize you can really do it?

Mr. Floyd: The need for what we can do is so great that most people we speak with hope we can be successful. That said, you are right: the "aha" moment comes when potential customers believe that we can do what we have said we can do. Often, that moment occurs when we bring them to Ottawa and they see our demonstration facility. Our demonstration facility is rated at 85 tonnes per day, about half of what we would build as a commercial-scale module. It is a big, impressive facility. When people actually watch many tonnes of heterogeneous garbage go in and electricity come out, then they believe. Most people also believe we can successfully scale up from half size to full size. Most developers in the process and energy industries demonstrate new technology with a very small pilot plant and attempt to scale directly to commercial production, a task that is often expensive and long. There really is not an economic sweet spot for plant scale in the middle of that range, so it is very unusual that Plasco has an asset such as our Ottawa demonstration plant, but we do and it serves us well.

CEO CFO: What was the biggest challenge in putting the offering together?

Mr. Floyd: Like most technology organizations, we began by thinking that the technology itself was the big challenge. As we began to master the technology, we also began to understand that the commercial application of the technology is really how we transform this young enterprise into a business. Throughout this year, we have worked very diligently on reducing the capital cost of building our plants, reducing the operating cost of running our plants and enhancing the

sources of revenue that we produce while operating our plant. It has been very interesting as we shifted our focus from purely technology development to business development. The team has responded remarkably. We have found impressive improvements in operating expense, capital expense and revenue.

CEO CFO: Does your background help gain credibility for Plasco or is it really all about the technology?

Mr. Floyd: It is really all about the technology. I do have a good ability to represent the technology since most people recognize that I have successfully been at this for a very long time. But at the end of the day, you have to have good technology, independent of who is representing it.

CEO CFO: What is the plan?

Mr. Floyd: Our business plan is to get the first plants up and running and make Plasco technology a real, demonstrable, commercial success. We anticipate that our investors will take most of the financial risk of those initial plants. That visible success in multiple jurisdictions will result in more "aha" moments. Potential customers will recognize that Plasco is not only a good idea that works in our demonstration plant, but it is a technology that works in the real world of municipal waste. When it is apparent that our process does just what we have said it will do, future plants can be financed through normal project financing.

We have had a variety of independent engineers, and many other highly qualified people who have assessed our technology. It is not just our own engineers who believe it is ready; it is a lot of other people as well. But we know that most customers will only truly believe in the technology once it works in commercial application. Our plan after commencing the first plant in Ottawa is to formalize the Beijing and London agreements now in progress. Perhaps as fast as six months after the first plant starts we will have the second plant in production and six months after that have the third plant in production. We will carry forward from there and build a business.

Initially we will be relying very heavily on our current investors. We are extremely fortunate to have investors such as the Ares Group, which is a massive fund; George Soros and his family fund, which is massive; and West Face Capital, a large Canadian fund. With our strong supporters, we can progress our business very quickly. Our expectation is that beginning in the last half of 2017, future plants will obtain commercial project financing and we will start returning funds to our investors. At the end of the day, that is the business we are in, and we are looking forward to getting there in the next three years.

CEO CFO: Why are you convinced this is the right time for addressing waste and energy, or is it more of the right technology that is making it the right time?

Mr. Floyd: Communities have recognized for some time that landfill is bad in every way. However, when the only available remediating technology was incineration that appeared to be a very bad trade off. The one thing that most communities hate worse than landfills is incinerators. The completion of Plasco technology is clearly a big part of the answer to make this the right time. The fact that Plasco technology destroys the waste without producing a new source of pollution and produces enough revenue to pay for the ownership and operation of our assets makes a nice package for communities.

Additionally, the Plasco team makes this the right time. There have been several technologies in this space that did not succeed. The classic examples are cellulosic ethanol and bio-digestion. Those are technically easy processes, so many communities rushed to build plants only to learn later that these were such ineffective processes that they could not be economic. There have been a variety of projects and companies in this space that have started and stopped without becoming reality either because the technology was inefficient, or because the corporate financing was insufficient to survive early difficulties. Plasco enjoys an excellent technology and business team collaborating with investors who see the long term opportunity and have the resources to get us to that end. Our technology is more complex than failed technologies, but also more effective. Fortunately we have the technical and financial capability to complete the development and deployment of our capabilities.

CEO CFO: Would you tell us about your facility in Spain?

Mr. Floyd: Prior to 2005 we had in Ottawa what could be described as a traditional pilot plant, the same sort of small scale pilot plant common to the process industry that I referred to earlier. In 2005, we transferred that plant to an investor in Spain who wanted to demonstrate Plasco technology in Europe. At that time we began to build the Plasco Ottawa demonstration asset, which I described to you earlier as a near commercial-scale asset. The Spanish demonstration plant has been surpassed by recent technology developments and is no longer in use.

CEO CFO: How are you sure you have the technology right at Plasco?

Mr. Floyd: I think you have hit on exactly the issue that underlies the essential question of commercial success: does the new technology work and can it work in a way that makes it economic for commercial application? At Plasco we have great confidence that our process operates well, with economic cost to construct and operate and enough revenue to fund

itself. This is not just our internal opinion. Our technology has been subject to multiple, knowledgeable and informed, external reviews, all with the same opinion.

Importantly, economics of technology use is a critical issue and we get revenue from at least three sources. First, we get revenue from “tipping fees” that would otherwise be paid to put material in a landfill. We also get revenue from the sale of electricity. Finally, the inorganic material that goes through our process comes out as a glass-like material that has a variety of industrial uses, and we get paid for that.

The fourth revenue source is opportunistic. Unlike incinerators and most other waste destroying processes, the Plasco technology can produce usable water. We are currently talking to people in the Arabian Peninsula and Caribbean Islands who have both garbage problems and a shortage of water.

CEO/CFO: Why is Plasco Energy Group an exceptional company?

Mr. Floyd: At the end of the day, communities do not want new landfills and some existing landfills are coming to the end of their life. Many communities are beginning to seek alternates that are both environmentally clean and economic. We think this is exactly the right time for a company like Plasco, and we really think Plasco is the best of the companies in our space. Plasco technology destroys garbage, solves the landfill problem, solves the pollution problem, and pays the municipality for doing that, which is the best of all possible solutions.

BIO: Ray is President and CEO of Plasco Energy Group Inc. Ray has previously held officer roles with Exxon Mobil and Suncor Energy, where he was most recently Senior Vice President, with responsibility for Suncor's Oil Sands assets in Fort McMurray, Canada.

For more than thirty years, in several different industries, Ray has led some of the world's largest and most complex industrial operations to deliver publicly recognized, industry-best performance.

Ray is acknowledged as an early adopter and one of the most successful practitioners, as well as a seminal thought leader in creating the strategy, tactics, practice and culture of Operational Excellence.

Ray is the only person in the energy industry inducted into the Manufacturing Hall of Fame. He is also the only person in any industry with Shingo Prize recognition for both “Operational Excellence” and “Research and Publication”, as well as the only person to earn the “America's Best” designation in both discrete and process manufacturing.

During 24 years with Exxon, Ray led six different entities, each of which was publicly recognized for performance that was the best in industry. After retiring from Exxon, Ray had responsibility for Suncor's Oil Sands Group assets and led them to industry best performance.

Ray is now a board director Plasco Energy Group. Ray has NFP experience as director and chair of the United Way and Exxon's Credit Union as well as FP JV boards with both Exxon and Suncor, including the board of Syncrude Canada. Ray has received Bachelor of Science in Chemical Engineering, Master of Business Administration, and Juris Doctor degrees as well as executive education at the most prestigious institutions in Japan and Europe.

Plasco Energy Group Inc
1000 Innovation Drive, Suite 400
Ottawa, ON K2K 3E7
613-591-9438
www.plascoenergygroup.com