

Priming the pump with plastics: Harnessing value from trash

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At the current rate of pollution, experts say that by 2050 oceans are expected to contain more plastics than fish (by weight volume), and the entire plastics industry will consume 20 per cent of total oil production, and 15 per cent of the annual carbon budget. The problem is not limited to marine environments; agricultural land, surface waters, freshwater lakes and rivers and, landfills are also contaminated with plastics and suffer as a result.

According to a recent report by the Ellen MacArthur Foundation, only 14 per cent of plastic packaging materials are recycled today and more than 7 million tonnes of plastic, mostly packaging, ends up in the oceans each year, killing fish and other wildlife. Harnessing the fuel content of the 86 per cent of used plastics currently not recycled could create US\$80 billion to US\$120 billion in revenues. Plastics are created primarily from energy feedstocks, usually oil or natural gas, and therefore have an intrinsic value as a fuel source. Innovative solutions and technology helmed by smart business leaders can drive an integrated circular economy approach to create value from this stored energy while delivering significant environmental and economic outcomes by producing this liquid fuel source.

Enerkem is a Montreal-based biofuels and specialty chemicals producer that has developed an award-winning and game-changing technology that converts non-recyclable and non-crop-based waste—such as discarded sofas, running shoes, plastic food containers, candy wrappers and old diapers—into advanced biofuels such as methanol and ethanol. The company was the first in the world to produce household waste-derived biofuels on a commercial scale and remains the only company across the globe doing this.

In 2014, Enerkem inaugurated the first of its kind commercial scale waste-to-biofuels facility. As part of a 25-year agreement with the City of Edmonton, Enerkem can process some 100,000 dry tonnes of sorted municipal waste – primarily household refuse – every year. In fewer than five minutes, Enerkem's technology produces a synthetic gas and converts it into renewable, non-toxic, water-soluble, highly biodegradable and clean burning transportation fuel and renewable chemicals, used respectively as a high octane oxygenate in gasoline and in everyday products such as cleaning solvents, paints and plastics.

At its Edmonton plant, Enerkem's technology produces enough to fuel over 400,000 cars on a 5 per cent ethanol blend. It will also help Edmonton achieve its overarching goal to increase its waste diversion rate up to 90 per cent. The company was the first ever waste-to-biofuel commercial facility to receive approval and registration from the US

Environmental Protection Agency (EPA) as well as from the International Sustainable Carbon Certification.

Biofuels from urban waste and residual biomass provide alternative fuel sources that can complement petroleum in the global fuel pool, and positively impact today's most pressing energy and environmental issues, including plastics pollution. While it enables diversion from landfill or incineration and drives other sustainable waste management, it simultaneously reduces greenhouse gas emissions and helps oil companies meet obligations to use renewable fuels.

The emergence of alternative fuel sources is driven by the need to reduce dependence on oil and greenhouse gas emissions as well as to increase energy diversity. Our company continues to build partnerships with municipalities and industrial groups to implement biofuels production facilities worldwide.

In the months to come, the company is slated to begin the construction of a new facility in Varennes, Quebec. It is also developing similar projects in the US and elsewhere across the globe where markets are driving demand.

In Europe, the company is developing its first project with a consortium led by AkzoNobel, Air Liquide, and the Port of Rotterdam in the Netherlands. The planned facility will provide a sustainable alternative to incineration. It will manage more than twice the volume of the Edmonton facility, processing up to 360,000 tonnes of household and industrial waste, plastics, and wood residues into up to 220,000 tonnes per year of low-carbon methanol.

Recently, the company joined forces with Suez in Spain to build a €250M waste-to-methanol plant near Barcelona. Using 375,000 tonnes of plastic, paper and textiles, the facility will produce 265,000 tonnes of renewable fuel annually. In the region only 10 per cent of waste is currently recycled, ending up either buried or incinerated. The new project is expected to boost it to 70 per cent, with the possibility to increase furthermore.

Earlier this year, Enerkem signed an agreement with Sinobioway Group worth over C\$125M to manufacture, license and launch the construction of some 100 state-of-the-art facilities in China by 2035.

Oil prices have been on a rise for more than two years and are now higher than in 2005 when oil prices, climate change and energy security fears first drove the establishment of biofuels programmes. Regardless of the change in oil prices, we know that there continues to be a growing desire for renewables and a need to address the environmental impact of plastics and other materials polluting the planet. It is a tremendous opportunity for the oil and gas sector to reinforce its innovation and leadership. ●