

Completing the circle

Converting municipal solid waste to useful fuels and chemicals has been proven at commercial scale by Enerkem. The company is now in talks for further investments in the US and Europe

CYNTHIA CHALLENGER VERMONT, US

Enerkem's thermochemical technology enables the conversion of carbon-based waste to renewable fuels and chemicals. The Montreal, Canada-based company was founded in 2000 to commercialise technology originally developed by Dr Esteban Chornet at the Université de Sherbrooke in Quebec.

Chornet and his son Vincent, who serves as Enerkem's president and CEO, garnered Can\$504m in private financing and government support and have shepherded the technology through pilot and demonstration phases to the start-up of a commercial-scale plant in Edmonton, Alberta in 2016.

Construction of a second commercial site in Quebec will soon be commissioned and the company is in advanced discussions for the installation of biorefinery plants in Minneapolis in the US and the Netherlands.

Enerkem announced in mid-September this year that in addition to biomethanol, it has launched the production of cellulosic ethanol from waste at its Edmonton biofuel facility.

Enerkem's four-step thermochemical process involves feedstock preparation, gasification, cleaning and conditioning of the generated synthetic gas (syngas), and catalytic conversion of the syngas to biofuels and biomethanol. Sorted, shredded and dried feedstock – essentially any non-recyclable waste materials with carbon molecules, such as municipal solid waste, various types of biomass, such as agricultural waste, and plastics and textiles – are converted in a bubbling fluidised bed gasifier to synthetic gas.

The heat generated is recovered and used in other parts of the process, making the system highly energy efficient. The syngas is passed through scrubbing towers and a water treatment process to remove contaminants and then subjected to catalytic conversion to generate biofuels and renewable chemicals.

"This disruptive technology will clearly help decarbonise the planet," says Pierre Boisseau, senior director of communications and marketing for Enerkem. "Using non-recyclable waste, which is an abundant resource available everywhere and a major challenge for municipalities around the world, as feedstock to manufacture renewable chemical intermediates that find their way into everyday products sets a new standard in smart waste management."

"Enerkem's proprietary technology provides a cost-effective, sustainable alternative to the challenges associated with waste disposal for communities around the globe," he adds.

In addition to diverting waste from landfills and incinerators, the gasification technology reduces significantly the dependence on fossil fuels and serves as an excellent example of how a true circular economy can be achieved, according to Boisseau.

Realising a commercial process was a 15-year journey for Enerkem. Gasification technology has been around for a very long time, but extensive work was required to develop a process that was cost-effective for the widest possible range of waste materials.

PIERRE BOISSEAU
Senior director, marketing and communications, Enerkem

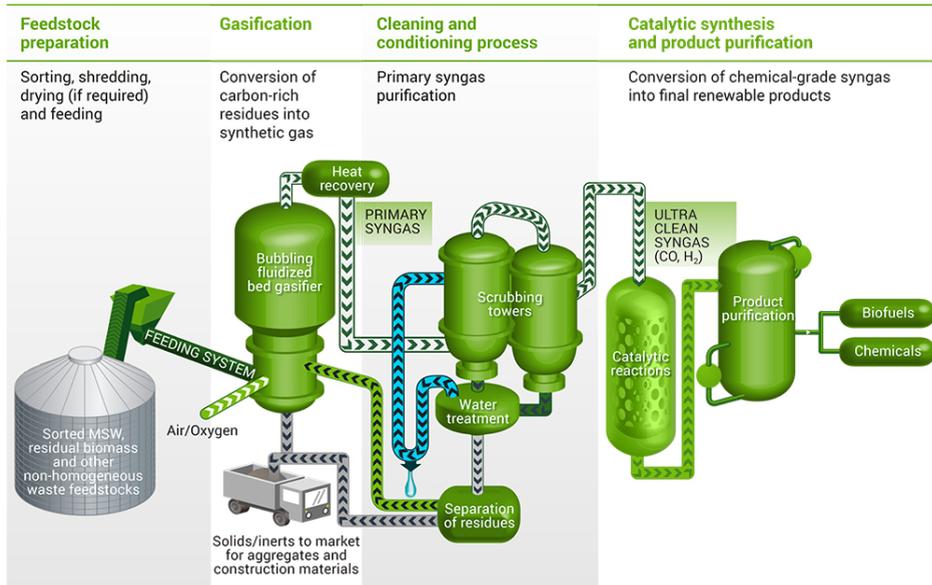


"We are already working on the next-generation of our technology"

"It was a painstaking process to prove that the technology was efficient and viable on a commercial scale. Development was undertaken in a disciplined and rigorous manner to ensure that no important issues went unaddressed. Moving first to the pilot scale and then operating a demonstration plant was the right strategy and allowed us to achieve the world's first commercial waste to biofuel/biochemical plant," Boisseau asserts.

That first facility uses residential, solid municipal waste from the city of Edmonton, while the second facility in Canada will use industrial, commercial and institutional waste, as well as construction and demolition waste.

Enerkem continues to invest in innovation to develop the gasification technology. "We are already working on the next-generation of our technology that will afford a more optimised production process. We want to make the technology as robust as possible. The process was designed from the start to undergo evolutionary improvements," Boisseau observes. The company is also investing in R&D efforts to develop processes for the production of other biochemicals using its thermochemical technology. ■



* Municipal solid waste

The four stages of the Enerkem process take waste to chemicals

For more information, go to:
www.enerkem.com