



Turning Waste into Renewable Natural Gas

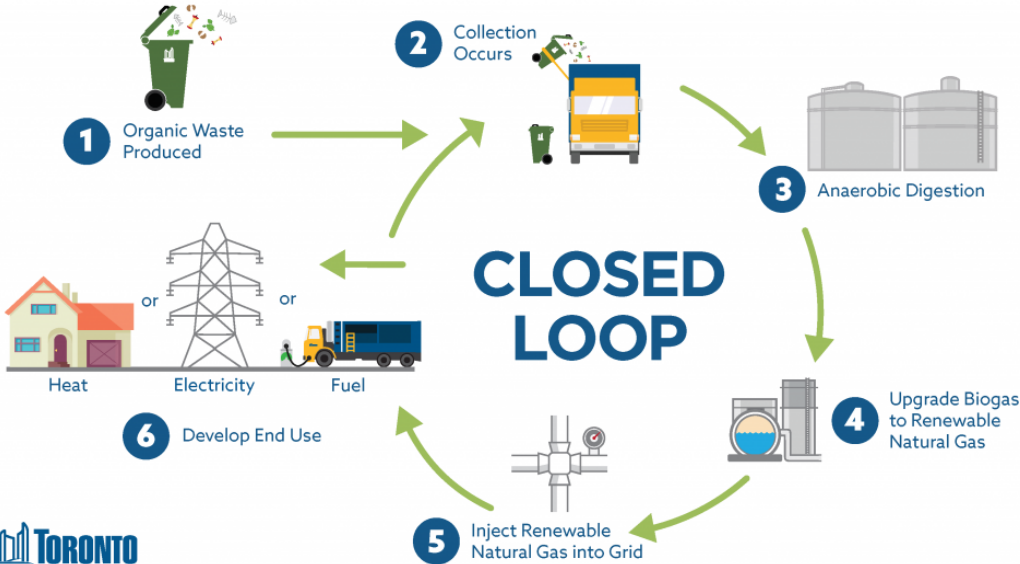
The City wins a [2018 Energy Vision Leadership Award](#) for its innovative renewable natural gas project.

The City, in partnership with Enbridge Gas Distribution Inc., will begin installing new equipment at the Dufferin Solid Waste Management Facility in 2018. The new technology will allow the City and Enbridge to transform the raw biogas produced – from processing Toronto’s Green Bin organics – into renewable natural gas (RNG) and inject that gas into the natural gas grid. Once in the grid, the City will be able to use the RNG to fuel its collection trucks.

This project is one of the first of its kind in Canada and North America and will allow the City to reduce fuel costs for its fleet of collection trucks and significantly reduce its carbon footprint. Current estimates suggest that the Dufferin RNG facility will produce approximately 5.3 million cubic meters of RNG per year – enough to power 132 heavy duty garbage trucks, about 90 per cent of the City’s solid waste collection fleet.

The project supports the City’s [Long Term Waste Management Strategy](#) and [move toward a circular economy](#) by using a closed-loop approach where organics collection trucks are ultimately powered by the waste product they collect.

This is the first of four waste-to-RNG production opportunities identified by the City.



Circular model showing how waste can ultimately be used to create green energy.

The City's Path to RNG

The City of Toronto's existing and closed landfill sites and anaerobic digestion (organics processing) facilities are some of the largest producers of biogas and landfill gas in Ontario. Over the last few years, the City's has been looking for opportunities to harness the green energy potential of these gases and identified renewable natural gas (RNG) as a top priority for biogas management.

The City has been transitioning from diesel-powered trucks to quieter and more environmentally friendly natural-gas-powered trucks since 2010, when the first small-scale pilot hit the road. To support the move away from diesel, the City also constructed a number of natural gas fuelling stations.

After identifying RNG as a priority, the City began searching for technologies and partnerships to upgrade its biogas and landfill gas to RNG. When looking at the different technologies and options for upgrading and transporting biogas, the City took a triple bottom line approach that considered the economic, social and environmental benefits.

Through multiple studies, the City identified RNG production opportunities at four locations: its two anaerobic digestion (organics processing) facilities (Dufferin and Disco Road) and two of its landfill sites. The first site to get new equipment to upgrade its biogas to RNG is the Dufferin Solid Waste Management Facility.

Once all four RNG sites are up and running, estimates suggest that the City will be able to produce approximately 65 million cubic metres of RNG per year – the equivalent in greenhouse gas emission reductions of taking 35,000 cars off the road for a year.

Biogas Upgrading

Both biogas and landfill gas can be upgraded to create RNG. The biogas produced through anaerobic digestion is made up primarily of methane, but also includes carbon dioxide, oxygen, nitrogen, water, sulphur, and various non-methane organic compounds.

Biogas upgrading involves purifying the gas to remove carbon dioxide and other contaminants. The result is a gas that is more than 90 per cent methane and can be injected directly into natural gas pipelines. The RNG can then be transported to the City's natural gas fueling stations and used to fuel its trucks.

Biogas at the City's anaerobic digestion facilities is currently flared (burned), which is common industry practice for managing biogas, but does not take advantage of its renewable energy potential.

The Benefits of RNG

While chemically identical to traditional natural gas, RNG is a renewable resource that can be produced using materials that are readily accessible through the City's Green Bin organics program.

RNG is also less expensive and more environmentally friendly than fossil fuels such as diesel. Once injected into the natural gas pipeline, it can be used to fuel vehicles or provide electricity or heat to homes and businesses.

RNG generated from food waste is actually considered carbon negative, because the reduction in emissions by not extracting and burning petroleum-based fuel, and the emissions avoided by not sending organics to landfill, exceed the direct emissions associated with the production and use of RNG.