

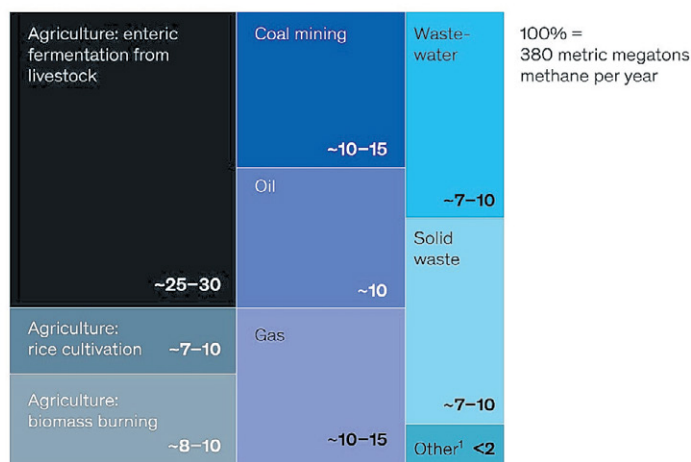
The Potential of Landfill Gas Utilisation in Trinidad & Tobago

At the recently concluded COP26 meetings in Glasgow, more than 100 countries joined a coalition to cut 30% of methane emissions by 2030 compared with 2020 levels. While the new initiative is focused on tackling methane leaking from oil and gas wells, pipelines, and other fossil fuel infrastructure, significant amounts of methane also come from other sources, such as agriculture, wastewater, and decaying waste in landfill sites, as shown in Figure 1.

Figure 1: Global Methane Emissions from Human Activities, % Share

Methane from human activity is emitted by five key industries: oil and gas, coal, agriculture, solid waste, and wastewater.

Global methane emissions from human activities, % share



¹ "Other" includes industry and vehicle transport emissions.
Source: Marielle Saunois et al., "The global methane budget 2000-2017," *Earth System Science Data*, 2020.

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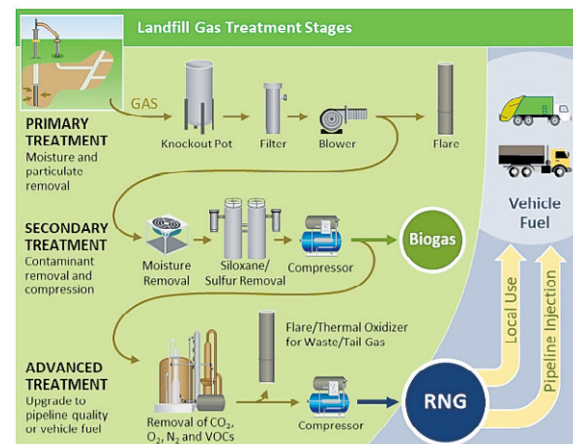
With a global warming potential greater than carbon dioxide (CO₂) and a short (12-year) atmospheric life, methane is the second-largest contributor to global warming after carbon dioxide. It is responsible for more than a quarter of current global warming, a significant contributor to global climate change. In addition, methane contributes to background tropospheric ozone levels as an ozone precursor¹.

Landfill Gas to Renewable Natural Gas

Landfill gas is the natural by-product of the decomposition of organic material in landfills. It is composed of roughly 50% methane (the primary component of natural gas), 50% CO₂, and a small amount of non-methane organic compounds. As a result, reducing methane emissions from municipal solid waste (MSW) landfills is considered among the best ways to achieve a near-term beneficial impact in mitigating global climate change. Through treatment processes, landfill gas can also be upgraded to renewable natural gas (RNG), a high-Btu gas, increasing its methane content and, conversely, reducing its CO₂, nitrogen, and oxygen contents. RNG can be used in place of fossil natural gas, as pipeline-quality gas, compressed natural gas (CNG) or liquefied natural gas (LNG). Options for the use of RNG include thermal applications, to generate electricity or as fuel for vehicles. The RNG can be used locally at the site where the gas is produced or can be injected into the natural gas transmission or distribution pipelines for delivery to another location.²

Utilising landfill gas as a renewable energy source helps meet energy needs, improves environmental and health concerns, and provides economic benefits such as revenue generation, job creation, and market development, as summarised in Figure 2.

Figure 2: Treatment Stages of Landfill Gas



Source: Environmental Protection Agency (EPA), 2020

Waste Management in Trinidad and Tobago

In Trinidad and Tobago, most MSW is disposed of in four main landfills: Beetham Landfill, Forres Park Landfill, Guanapo Landfill and Studley Park Landfill, which are either close to capacity or are at capacity and still collecting waste. Approximately 55% of Trinidad's MSW goes to Beetham, 16% to Guanapo, and 29% to Forres Park, with 100% of Tobago's waste going to Studley Park.

According to the Waste Management Report presented before the Joint Select Committee of the Parliament in 2019, the average person in Trinidad and Tobago generates approximately 1.5 kilograms of waste per day, which amounts to approximately 2,000 tonnes of waste that reaches the landfill sites per day. This figure does not include the large quantities of waste which are improperly disposed of, polluting our streets, drains, rivers, beaches, and other environs³. In 2020, Trinidad and Tobago had a forecast estimate of 1.56 million tonnes of solid waste generated per annum.

NGC, National Energy, NGC CNG and SWMCOL's Partnership

Recognising the value-added potential of LFG to Trinidad and Tobago's economy and decarbonisation efforts, on September 13th, 2021, a Memorandum of Understanding (MOU) was signed among NGC, National Energy, NGC CNG, and SWMCOL, to explore opportunities to capture and commercialise landfill gas for uses such as the provision of carbon-negative, renewable compressed natural gas.

Through this MOU, the Parties will:

- ✓ identify and quantify landfill gas emissions for existing MSW landfills
- ✓ explore existing and new infrastructure requirements to facilitate transportation and commercialisation of extracted landfill gas volumes and
- ✓ explore opportunities for utilisation of the derived renewable compressed natural gas as an alternative transportation fuel for vehicles.

This initiative is intended to not only contribute to Trinidad and Tobago's energy transition journey, but also create new revenue streams for the country.

Now more than ever, renewable energy and energy efficiency initiatives are needed if we are to create a circular economy and achieve our sustainable energy future. Harnessing the power of Landfill Gas is yet another step in the right direction to reducing greenhouse emissions and creating a healthier environment for all.

1. <https://www.epa.gov/lmop/basic-information-about-landfill-gas>
2. <https://www.epa.gov/lmop/basic-information-about-landfill-gas>
3. <https://www.swmcol.co.tt/index.php/education/7-waste-management-topics>



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