Landfills And Energy

Landfills offer many benefits as a renewable energy source.

- **Reduction of methane emissions (21 times more potent than CO_2 as a greenhouse gas)**
- **Offset dependence on fossil fuels**
- **Reduction in emissions of SO_2, NO_x, PM and CO_2**
- **Cost competitive—prices do not fluctuate with national markets**

CAT 3616 engines at a LFG power plant in Scranton, PA.

Municipality of Anchorage

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Landfill Gas to Energy Possibilities

Today's Trash...

...Tomorrow's Power

Using LFG for Power

Landfill gas is an economically viable and safe source of fuel for use in heating and electrical generation. Not only are emissions lower than the typical equivalent fuel use, but use of LFG offsets dependence on traditional fossil

Landfill gas being delivered from a landfill in Michigan to General Motors

fuels. LFG is a recognized renewable energy resource and will not fluctuate with fossil fuel prices. There are currently more than 350 projects across the US using LFG to generate over 8 billion kWh of electricity along with almost 38 million mmBtu's of heat*. Companies such as Ford, Chevrolet, NASA, and Frito Lay are all benefiting from the use of LFG.

Why not Anchorage?

*Source: EPA's LMOP

What is Landfill Gas (LFG)?

Landfill gas is the by-product of natural decomposition of waste in a landfill. When garbage is buried in the landfill, it goes through two stages of chemical reactions. The first stage is aerobic decomposition which is essentially composting. Organic material is degraded in the presence of oxygen. When the oxygen is depleted, the bacteria and organisms start anaerobic decomposition (Stage 2) which is when methane (CH_4) is generated. Landfill gas is comprised of methane (50%), carbon dioxide (50%), and trace organic compounds. Some of these trace organic compounds are regulated by the EPA.

So Why is Landfill Gas Good?

Landfill gas has methane which is what is typically referred to as natural gas. This is the same gas burning in your gas range at home. The difference is the presence of CO_2 and the trace organics. As such, LFG has a fuel value equal to roughly half of pipeline quality gas (LFG - 500 Btu/cf, pipeline gas - 1,012 Btu/cf). With relatively little cleanup or equipment modifications, LFG can easily be used in boilers, asphalt plants and other direct fire heating units. With some minor cleanup, LFG is readily used in electrical generation engines and turbines.

Landfill Gas-to-Energy project in Ft. Wayne, IN showing the gas compressor and backup flare

Gas is being delivered to a BMW plant.

Anchorage Regional Landfill Statistics

- Opened 1987
- 5,400,000 tons of waste to date
- 14 million tons of remaining capacity
- Accepts 360,000 tons per year

Power Potential

Currently estimate LFG production at 700-1000 cf/min (21-30 mmBtu/hr)

Equivalent to:

- 2.5-3 megawatts of power
- Power for approximately 2,500 homes
- 10,000 gallons/day of liquefied natural gas
- 1,900,000 gallons of diesel fuel per year.

Given that LFG generation is related to garbage disposal, the amount of LFG generated will continue to increase until landfill closure. At closure, LFG generation is expected to be triple of today's values.

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