



# Alternative fuels

## > Case History

Viridor Waste Management Landfill, Scotland



**Power  
Generation**

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### **Where:**

Viridor Waste Management Landfill, Dunbar, Scotland, UK

### **What:**

Design and build of a 3.5 MW turnkey waste-to-energy power plant, featuring two Cummins Power Generation 1.75 MW low-Btu gas generator sets, switchgear, PowerCommand® controls, fuel treatment and a 10-year operation and maintenance agreement

### **Purpose:**

To recover methane from landfill and generate low-cost electricity for a large cement plant

### **Primary choice factors:**

Cummins Power Generation provided the highest kilowatts-per-dollar of investment and assisted in solving grid connectivity issues

## **Scottish landfill turns methane into electricity with system from Cummins Power Generation**

DUNBAR, SCOTLAND — Viridor Waste Management, one of the United Kingdom's largest operators of municipal landfills, manages a 193-acre site east of Edinburgh, Scotland. In addition to disposing of thousands of tons of solid domestic waste daily from the city of Edinburgh and other nearby communities in a safe and environmental manner, Viridor uses two low-Btu gas generator sets from Cummins Power Generation to produce 3.5 MW of electricity from the methane created by decaying rubbish.

As paper and other organic materials decompose in landfills, a natural by-product of that decay is methane — one of the major flammable components of natural gas. While this natural release of methane is dilute, it is a powerful greenhouse gas that can contribute to global warming. Harnessing this gas to produce electricity protects the environment while generating valuable energy.



The site features two model 1750 GQNA low-Btu generator sets designed to run on dilute methane.



The conduit coming out of the power building contains the 11 kV transmission line that powers the cement plant.

### **New, low-Btu generator sets**

The installation features two 1.75 MW low-Btu generator sets from Cummins Power Generation operating in parallel. The model 1750 GQNA low-Btu generator sets feature the Cummins QSV91G gas engine that is specifically modified to run on dilute methane. The engine has an enlarged fuel delivery system, double-safety gas shutoff valves, and special coatings and bearing materials to withstand corrosive contaminants that can occur in landfill or resource-recovery gas.

The generator sets are housed in a power building that has room for two additional generators. As the landfill grows and methane production increases, additional generator sets will be installed to produce a total of 7 MW. At current “tipping” rates, the landfill is expected to operate for the next 30 years.

“Methane production from the landfill is a steady 2,500 cubic meters per hour,” says Turner. “Right now, the gas being collected is about 55 percent pure methane, and we’re running the generators at full load, 24 hours a day, seven days a week.”

According to Richard Turner, director of waste to energy, Viridor Waste Management, Cummins Power Generation was selected to provide equipment for the Dunbar site because of the high power output of the generators per dollar of investment. Also because of the energy solutions they could provide, supported by the local distributor. “They helped solve complex connection issues for exporting electricity to the nearby cement plant which purchases the power.”

### **Grid connection problem solved**

“Normally, the output of the generators would be connected to the power grid and sold to a local utility,” Turner explains. “However, because of the high voltage of the local utility lines, there was no cost-effective way we could connect to the grid at this location. Consequently, all of the 3.5 MW is sold directly to the nearby Lafarge Cement works. Cummins Power Generation helped design the 11 kV system that connects to the cement plant.”

The project was eligible for increased revenue in the form of Renewable Obligation Certificates (ROCs), a government program to encourage the development of renewable energy projects and make the cost of power competitive.

*“This enables Viridor to invest in environmentally friendly waste-to-energy projects, generate electricity from landfill gas, sell it to the cement plant below the cost of power from the grid and still make money. Everybody wins,” according to Turner.*

### **Total energy solution**

Cummins Power Generation provided a full turnkey solution including the installation of the generator sets with switchgear and paralleling controls, fuel treatment for the landfill gas, mechanical and electrical design and the power plant building.

For more information on alternative energy solutions and other power solutions, contact your local Cummins Power Generation distributor or visit [www.cumminspower.com](http://www.cumminspower.com).

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