**Market Segment:** Landfill

# POWER PROFILE

## Pihourc Landfill

### POWER NEED

A significant issue for many regions in France is the problem of managing household solid waste. France's "Grenelle" environmental forum set a target of reducing household waste generation by 25 kilograms per person within five years. The goal is to achieve sustainable development and to make a vital contribution through our civic-minded efforts and behavior on a daily basis.

Located in a valley 90 kilometers from Toulouse, the Pihourc Landfill was set-up in 1996 and occupies more than 70 hectares of the land area. The landfill receives household waste from 463 communities and is buried with a geomembrane to prevent contact with the soil, even though the local subsoil has very low natural permeability. Officially known as a Non-toxic Waste Containment Landfill (ISDND), the facility processes 85,000 metric tons of household solid wastes collected by Intercommunity Multi-purpose Syndicate (SIVOM) in Haute-Garonne, Hautes-Pyrénées and Ariège.

Created in 1960, SIVOM headed by Jean-Louis Puisségur is responsible for collection, sorting and treatment of household wastes from 463 communities, representing a total population of 35,000. SIVOM generates revenues of €19 million, 50% from its waste-to-energy activities. The landfill generates a valuable biogas by-product which can be collected for energy recovery. It's no surprise that it's at the heart of the waste-to-energy policy promoted by Jean-Louis Puisségur, President of SIVOM.

### SOLUTION

Eneria France installed an exceptionally efficient biogas recovery system in 2006.

The biogas is collected via extraction wells and conveyed to the blowers that supply Cat® G3516 and G3512 generator sets that produce a combined 1,600 kW of power. Equipped with two generator sets with 950 kW and 650 kW capacity, the installation produced more than 12,800 MWh of power per year at full capacity.

As the waste decays, biogas is generated and recovered for energy production. The landfill site is divided into sections of several hectares and these sections are then subdivided into cells of 5,000 square meter area. The bottom of the cells are lined with a puncture-resistant geotextile laid over a bed of aggregates. A drainage network is installed to collect the leachates.

Waste is buried to a thickness of 25 to 27 meters and covered over with a 2.5 meter-thick layer of impermeable clay to decompose the waste. As ferment, the waste generates biogas containing between 42-45% of methane.

The life span of waste is approximately 15 years. Delivered as "fresh" waste with an average relative density of 0.6, it evolves into "young" waste that is compacted to a relative density of 1. After approximately 15 years, it acquires the status of inert waste. During this cycle, its decomposition generates biogas over a period of 10 to 12 years.

It is important to realize that over the years, the biogas production capacity of a landfill varies significantly according to a complex set of parameters, such as the quantity of waste, the frequency of placement, its composition, and climate variables. Organic wastes are in fact

### CUSTOMER

Intercommunity Multi-purpose Syndicate (SIVOM)

### LOCATION

Pihourc, France

### CUSTOMER BUSINESS ISSUE

Power generation using biogas recovery from 463 communities

### SOLUTION

- 1 - Cat® G3512 Generator Set
- 1 - Cat® G3516 Generator Set

### CAT DEALER

Eneria France

CATERPILLAR®

living materials. Therefore, the know-how and experience of SIVOM's biogas specialists are irreplaceable. They adjust the valves of the extraction wells and control the sophisticated computer program that manages the gas flows and the blowers. It took Eneria France two years to acquire full mastery of the economics and environmental balance involved in the waste-to-energy process.

The biogas recovery modules blended smoothly into the site. Eneria France designed an enclosure for the generator sets measuring three meters in width and opening in the front; this configuration makes the G3512 generator set interchangeable with the G3516.

When running at full capacity, the generator sets are connected to the French power grid's medium-voltage network (20 kV). Its annual power output is equivalent to the consumption of 5,100 households (the average household consumes 2,500 kWh per year of electricity excluding heating).

Eleven people handle the complete day-to-day management of the facility. The power plant operates 8,000 hours, or 11 months, per year. It is maintenance-free with the exception of programmed maintenance visits. In addition, Eneria France is commissioned for a remote operated service.

## RESULTS

The idea of recovering biogas for power generation was suggested to Jean-Louis Puisségur several years ago by the head of the Turboméca Company, who at the time offered to install a lean-burn helicopter turbine. As SIVOM's president explains, "The engine project is the foundation of the entire waste-to-energy system that we have put in place for household solid wastes. We enjoy a true spirit of teamwork with Eneria France, as we join forces to serve the public good".

Laurence D'Anterroches, head of SIVOM's Household Waste Department, says , " We chose the Eneria France solution as the best of six proposals received after only six months of negotiations. The main reasons for this choice were Eneria France's excellent grasp of our needs, the solid technical guarantees they offered and their ability to come up with technical and commercial solutions that were always right on target." As SIVOM requested, for example, Eneria France substantially revamped the production site in 2008 to enhance its already remarkable performance. The purpose was to optimize the gas feed to the two generator sets in the recovery unit thus improving the biogas conversion efficiency thanks to a more powerful blower. The revamp works were carried out quickly and efficiently and the unit was brought on stream in September 2008.

The construction and landscape integration of the facility took place over a one-year period. Managed by SIVOM, which was awarded the French national Qualitri label in 2007, the landfill also has its own composting platform certified by the Ecofert label (a certification for organic fertilizers).

The ISDND underwent a major change in the sixteen-year existence of the facility. From its initial status as an ordinary dumping site, the SIVOM installation has been transformed into a sophisticated tool of environmental management based on rigorous control and optimization of resources on behalf of community residents.

*For more information, please visit www.cat-electricpower.com/pr.*

# POWER PROFILE

## Pihourc Landfill

LEXE0118-00 November 2009

© 2009 Caterpillar All Rights Reserved.
CAT, CATERPILLAR, their respective logos, "ACERT", "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

CATERPILLAR®
TODAY'S WORK. TOMORROW'S WORLD.™