

La Ciotat Landfill

When leaders of La Ciotat, a picturesque town along France’s Mediterranean coast, learned that waste methane gas from decomposing trash at the local landfill could generate electricity, they jumped at the idea.

For 20 years, landfill operators had flared the waste methane. In today’s energy environment, methane no longer is considered waste. At La Ciotat, it is the vital ingredient in a self-sustaining onsite power plant that produces about 1MW of clean electricity each day – enough power for 1,000 French homes.

Key to the innovative power plant are 18 CR65 Capstone MicroTurbines® that use methane to create electricity later sold to the grid. According to Xavier Lombard, CEO of Capstone’s Belgium- and French-based distributor, Verdesis, the 18 cost-effective 65kW microturbines produce less than half the emissions of reciprocating engines.

When compared to reciprocating engines, the deep emission reductions of La Ciotat microturbines are equivalent to removing 700 average U.S. cars from the road each day or the CO₂ reduction from up to 730 acres of pine and fir forests.



At a glance

Location

La Ciotat, France

Commissioned

June 2007

Fuel

Biogas

Technologies

- 18 CR65 Capstone Microturbines

Results

- Self-sustaining onsite power plant produces about 1MW of clean electricity each day, which is sold to the grid.
- 34,000 hours of continuous operation in 5 years.
- Microturbines run on waste methane gas previously flared for 20 years.
- Unlike reciprocating engines, microturbines can operate on biogas with methane content as low as 30%.
- 18 CR65s produce less than half the emissions of reciprocating engines. On average, emissions from traditional engines are 10 times greater than microturbines.
- La Ciotat emission reduction equivalent to removing 700 average U.S. cars from the road each day.
- The La Ciotat project inspired similar microturbine applications at 12 other landfill sites in France and Belgium.

“These microturbines are extremely flexible to variations in methane content, which makes them useful for landfill applications because methane content often decreases as landfills age.”

— Xavier Lombard, CEO

Verdesis

“To reduce carbon dioxide and nitrogen oxide emissions, engine manufacturers have to add pricey equipment,” Lombard said. “But even with the add-ons, emissions from traditional engines still are more than 10 times greater than the Capstone microturbines. The Capstone microturbines also are more environmentally friendly because they use air-bearing technology, which means they don’t need any oil, coolants, or other hazardous materials to operate.”

Commissioned in June 2007, the power plant at La Ciotat is a simple operation that recorded more than 34,000 hours of continuous operation in five years, and continues operating today. While Capstone microturbines generally do not require waste gases to be filtered, Verdesis designed a filter system that eliminates water, hydrogen sulfides, and siloxanes in the landfill gas.

Because it is located in a dry climate and is more than 25 years old, the La Ciotat Landfill produces waste gas with low levels of methane – as low as 30 percent. In comparison, newer landfills in less-arid environments produce waste gas that is more than 50 percent methane. However, the low methane content at La Ciotat does not inhibit the microturbines’ operation like it would for reciprocating engines.

“These microturbines are extremely flexible to variations in methane content,” Lombard said, “which makes them useful for landfill applications because methane content often decreases as landfills age.”

Based on the success of La Ciotat Landfill onsite power plant, Verdesis Group has installed similar Capstone microturbine applications at 12 other landfills in France and Belgium. ■



Eighteen C65 microturbines running on methane gas generate power and heat at La Ciotat Landfill in France.