



Electr'Od– Plessis-Gassot, France



Presentation of the project:

Inaugurated in June 2014, Electr'Od converts non-recyclable municipal waste into renewable energy (electricity and heat). Located at the non-hazardous waste landfill at Plessis-Gassot to the north of Paris, the facility harnesses biogas produced from non-recyclable waste and generates 130,000 MWh/year of electricity. That is the equivalent of the electricity consumption of around 41,200 homes.

Electr'Od is a cogeneration facility; in addition to generating electricity, it also produces 30,000 MWh/year of thermal energy – the equivalent to the amount of thermal energy consumed by around 2850 homes. This thermal energy is being used to feed a new heating and domestic hot water network serving the entire population of Plessis-Gassot, including its town hall, community centre, church and municipal building. This is the first time in France that a town is being heated with energy recovered from biogas. Electr'Od consists of 10 gas engines with a total capacity of 17 Mwe - making it France's most powerful biogas production facility - and handles 100 million m³ of biogas each year.

Parties involved:

- Contractor: Véolia Propreté
- Studies/operator: GRS Valtech

Objectives:

- Dehumidify biogas produced from fermented waste
- Increase the efficiency of the Electr'Od engines
- Lower the facility's running costs

The CIAT solution:

GRS Valtech chose CIAT's Drypack Plus to dehumidify the biogas of the Electr'Od facility. This dehumidification process involves cooling the biogas to condense the moisture in it, then reheating the biogas to dry it, before passing the dried biogas through activated carbon filters. By controlling the humidity, the activated carbon filters are more efficient thereby reducing the running costs. The Drypack Plus systems consist of equipment optimised by CIAT specifically for the Electr'Od facility using its experience in heat transfer, chiller energy efficiency and a high degree of droplet separation. The main difficulty consisted in sizing the shell-and-tube heat exchangers just right so they would maintain a very precise outlet moisture content. Many simulations were conducted using CIAT's proprietary software and across the entire range of the facility's operating modes to obtain the optimum moisture content requested by GRS Valtech.

Technical data and equipment:

6 DRYPACK PLUS systems each composed of:

- 1 LDH 540V water chiller
- 1 FSH 355.30 gas/water cooler
- 1 FSH 355.15 gas/gas economiser
- 1 SGMV 500 high efficiency droplet separator

