

EL GABAL AL ASFAR SEWAGE GAS PLANT

boosts power and cuts costs at one of Egypt's largest wastewater treatment facilities

Background

Egypt's El Gabal Al Asfar wastewater treatment plant is one of the largest of its kind in the country, serving 12 million residents in the Cairo region with a total capacity of 2.5 million cubic meters per day. With its latest expansion, the treatment plant is set to serve approximately 17.5 million people by 2040.

To make this vision a reality, the Construction Authority for Potable Water and Wastewater (CAPW) knew it needed to upgrade its sewage gas-run combined heat and power (CHP) plant. It sought to replace six older engines with more efficient technology that could supply the full load needed for the wastewater treatment plant as well as hot water for the biogas digesters while also offering dependable spare parts availability and lower ongoing maintenance costs.

For these reasons, CAPW turned to INNIO Group's Jenbacher technology, marking the first use of Jenbacher engines running on sewage gas in Egypt.

A more sustainable solution

The complex project involved the replacement of six older medium-speed dual-fuel (sewage gas and diesel) gensets. Six new sewage gas-operated Jenbacher J616 engines were installed, each with 2.43 MW of electrical output and 1.24 MW of thermal output. The new Jenbacher engines were connected to the existing network, and their operation was synchronized with four older units that remained at the plant. Meeting tight scheduling deadlines, the project was completed without interrupting operations at the wastewater treatment plant.

Energy & Contracting Solution Company (ECS)—INNIO Group's authorized Jenbacher distributor and service provider in Egypt—delivered the complete turnkey CHP plant, including the installation, commissioning, and operation.



»Already one of the biggest sewage treatment facilities in Egypt, the El Gabal Al Asfar wastewater treatment plant continues to grow, bringing the constant need to boost efficiency, cut costs, and operate more sustainably. This latest power plant expansion with INNIO Group's Jenbacher technology has advanced all of those goals and more. ECS worked hard to meet tight schedule deadlines, completing the project without interrupting operations at the treatment plant, which no longer requires additional power from the grid. That means more energy source stability from renewables to keep wastewater treatment operations going—even in the face of ever-growing demands.«

Hany Hashem Refaay,
Head of execution department, Construction Authority for potable water and wastewater, Ministry of housing and utilities

Results

Running on renewable sewage gas from the treatment plant, the new highly efficient Jenbacher units have a higher power output while using the same amount of sewage gas. In fact, the CHP plant's new configuration now supplies the full amount of power needed for the wastewater treatment plant's operations, reducing the need for power from the grid as well as cutting operational costs, and delivering greater power supply stability. The Jenbacher units replace diesel as a fossil fuel while also reducing spare parts and maintenance costs for the new plant.

The wastewater treatment plant uses the electrical and thermal energy from the new CHP plant to heat water used in the digester for improved digester performance and biogas production.

Customer benefits

The highly efficient CHP plant delivers a number of benefits to the El Gabal Al Asfar wastewater treatment plant, including:

- Produces more power with the same sewage gas consumption
- Reduces reliance on the grid and delivers a more stable power supply
- Cuts operational costs (by reducing need for diesel gas) and maintenance costs
- Delivers thermal energy for enhanced biogas production
- Covers the wastewater treatment plant's energy demand more sustainably—with renewable energy replacing some diesel fossil fuel

Key technical data

Engine type	6 x J616
Electrical output	14.6 MW
Thermal output	7.5 MW
Total efficiency	65.9%
Energy source	Sewage gas
Commissioning	2024



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