BIOSOLIDS
ENERGY

Sludge digestion unit of ALEXANDRIA EAST Wastewater Treatment Plant

XL digesters for Sustainable Sludge Management in one of Egypt's largest plants

The plant, operated by SUEZ since 2008, has a capacity of 800,000 m³ per day, making it one of the largest in Egypt. It treats the wastewater of more than 5 million inhabitants. In 2018, the Construction Authority for Potable Water & Wastewater (CAPW) awarded SUEZ for the DBO contract of a new sludge digestion unit, based on mesophilic anaerobic digestion and Combined Heat & Power. Successfully handed over in November 2022, this plant is a major achievement for SUEZ in terms of sludge digestion and green energy production.

Client objective

The sludge produced by the East Alexandria wastewater treatment plant was previously subject to a dewatering process, followed by transportation via trucks to a landfill located 45km away. The aim was to make the Alexandria Wastewater Treatment Plant more sustainable transforming sewage sludge into green energy to meet the environmental, social and economic challenges of the city of Alexandria. One of main challenges was to integrate strong health, safety and environmental constraints due the expansion of the town close to the plant

Our solutions

Thanks to SUEZ's **Digelis®** solution, based on **mesophilic anaerobic digestion**, the Alexandria East wastewater treatment plant produces biogas that is converted into **electricity and heat (cogeneration)** for the plant's energy needs. The plant includes 4 XL-sized digesters to achieve a high level of energy self-sufficiency.

4 digesters of 16,000 m³ each

We have implemented an **Advanced sludge mixing** (Geyser pump) to ensure optimum biogas production and sludge mineralization / stabilization for this type of large digesters

In-depth engineering, supported by specific studies allows to ensure the plant's compliance with strict health, safety and environmental requirements in a rare urban context for this type of project (Safety Integrity Level (SIL), ATEX, noise study, exhausted gas analysis).

Benefits

The plant prioritizes health and safety by adhering to stringent environmental norms, all while seamlessly fitting within an urban landscape.

Our solution enable the plant to achieve :

- up to **35% sludge reduction volume**
- up to **70% electricity self-sufficiency**,
- up to **65% Greenhouse Gas emissions reduction** compared to the existing plant, taking into account the construction and the operation.

The adoption of anaerobic digestion leads to a remarkable reduction of total emissions, reinforcing the commitment to sustainable practices and reducing the facility's carbon footprint.

Differentiating factors

Our expertise and latest advancements in digestion, as well as our experience of operators were significant to design, built this unit, and commission these XL digesters from scratch thank to an appropriate sludge inoculation strategy and a secure ramp-up process.

As part of a DBO contract, SUEZ involves its operation and maintenance teams from the construction phase to ensure a smooth transition.

60-70%
Self-sufficiency in electricity of the whole plant

Direct emissions reduced by 2/3rd GHG

2025-03-26

Alexandria East sludge digestion unit

XL DIGESTERS SUCCESSFULLY COMMISSIONED IN A RECORD TIME


Geyser pumps inside Digelis®


Checking of the gravity belt thickener


Digestion sludge recirculation and heating


Biogas compressor room (1,361m³/h)

Process commissioning from scratch

SUEZ had to handle the commissioning from scratch with no digested sludge available in Alexandria site.

The first step was to bring in a limited amount of sludge from another plant operated by SUEZ near Cairo, Gabal Wastewater Treatment Plant, while taking care not to disrupt the dewatering of the existing plant.

The second step was to prepare the tanks. 40% of treated water were put into each digester, supplemented by inerting 15 m^3 per digester of Nitrogen to remove the oxygen from the digester.

After this, the teams had to proceed with a normal ramp-up. Of the 4 digesters, two were seeded with 680 m^3 of digested and dewatered sludge with mixed sludge supply and some lime to adjust the PH. After two months, the other two digesters were filled in 1 month with enough production of biogas to generate the guaranteed electricity production.

A real challenge successfully met by SUEZ Engineering & Construction teams!

Starting from scratch, the digesters were commissioned in

3 months

a real record for such sizing!

TYPE OF CONTRACT
DBO
Design, Build & Operate

CONTRACT DURATION
DB: 2018 – 2022*
O&M: 2022 - 2024
The whole plant remains operated by SUEZ

CAPACITY OF THE WHOLE PLANT
800,000 m³/day

POPULATION SERVED
5 Million PE

** Includes extensions of time (nearly 18 months) due to external events*

SUEZ Engineering & Construction
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