

A pioneering green energy solution for Ajman

BESIX Middle East is proud to announce that in the spring of 2022, its flagship Sludge-to-Energy project in the Emirate of Ajman has successfully passed performance and reliability tests. Designed and built by BESIX Middle East for Ajman Sewerage (Private) Company Limited (ASPCL), the facility transforms what was previously considered a waste stream – sewage sludge – into a valuable source of sustainable energy.



Project details

Ajman Sludge-to-Energy

- Location**
Emirate of Ajman (UAE)
- Client**
ASPCL
- Contract type**
Design & Build
- Construction period**
2019 - 2022



The facility, the first of its kind in the UAE, allows for the on-site production of green energy covering up to 72 % of the electricity consumption of the ASPCL wastewater treatment plant in Al Jurf. The facility comprises two power generators with a combined capacity of 2.4 MW, which is equivalent to the energy consumption of 2,000 households in the United Arab Emirates.

A circular, ecological and cost-saving solution

Sewage sludge is a residual organic by-product of biological wastewater treatment, which sewage treatment plants have historically disposed of in conventional landfills. Instead, the Ajman Sludge-to-Energy facility digests the sludge to produce biogas, which is then used to generate heat and electricity that is used in the wastewater treatment plant itself.

This solution has environmental advantages. In addition to reducing the wastewater treatment plant’s reliance on the public power grid and providing a circular solution, the digestion process allows for a significant reduction of the sludge quantities, whilst avoiding the uncontrolled fermentation of unstabilised sludge which releases large quantities of greenhouse gases, generates odorous nuisance and poses a potential risk to public health.

In addition, the facility paves the way for further environmental upgrades such as the development of other by-products to recycle the sewage sludge into, such as organic fertilisers and alternative fuel for cement plants.

“
By utilising sludge to generate energy, ASPCL can reduce its energy costs and its carbon footprint, while also helping to reduce the volume of sludge that needs to be disposed of. This is an example of a sustainable and environmentally friendly approach to wastewater treatment.

Elias Sfeir, General Manager ASPCL

Design, construction, commissioning

The contract for designing and building the Sludge-to-Energy facility was awarded to BESIX Group by ASPCL in 2019 and construction continued throughout the Covid-19 period. This required a high level of creativity and flexibility from the project team and seamless cooperation between all stakeholders, including the local government electricity provider EWA (Etihad Water & Electricity).

This is the third Sludge-to-Energy project that BESIX has successfully commissioned in just five years. In the Netherlands, BESIX has successfully implemented similar biogas production and energy recovery schemes, including 100 % energy-neutral facilities.

Compliant with UAE strategy and European standards

The Ajman Sludge-to-Energy facility is fully aligned with the UAE Federal Government's strategic environmental and energy objectives, in particular the UAE Green Agenda 2015-2030 and the UAE Net Zero programme, a strategic initiative led by the Ministry of Climate Change and Environment to drastically reduce the country's dependence on fossil fuels through the development of green energies.



“

Through the unwavering dedication and resilience of our team, we have successfully completed a project despite the challenges posed by Covid-19. This accomplishment has enabled ASPCL to not only generate clean energy but also effectively manage their waste, contributing to sustainable development. It's an honour to have played a role in this achievement, and I'm proud of our team's outstanding performance.

Khaled Abdallah, Project Manager
BESIX Middle East (EPC)



“

Our O&M teams were involved in all stages of the project, from design to testing and commissioning, and received hands-on training provided by the construction team to ensure a smooth transition between construction and operations. The plant is easy to operate and maintain, and the use of predictive maintenance technologies ensures reliability and availability of the plant.

Mohammed Issa, Plant Operations & Maintenance
Manager BESIX Middle East

Sludge-to-Energy in a nutshell

Sludge-to-energy refers to the process of generating energy from the organic material that is left over after wastewater treatment, known as sludge. The sludge is composed of bacteria, organic matter and other solids that have been removed from the wastewater during the treatment process.

The basic process to produce energy from sludge typically involves several steps. First, the sludge is stabilised through anaerobic digestion to break down the organic matter and reduce its volume. During the stabilisation process, methane gas is produced as a by-product. This gas, which is often referred to as biogas, is then captured and treated to remove impurities such as sulphur compounds. In the ASPCL plant, the biogas is consequently used to power two state-of-the-art Combined Heat Power Generators which in turn allow to cover up to 50 % of the plant's energy needs.

More about Ajman Sewerage

Since 2006, Ajman Sewerage (ASPCL) has played a central role in managing the wastewater of the Emirate of Ajman. The company brings together BESIX, which owns 40 %, the Government of Ajman (40 %) and Veolia (20 %). ASPCL, the first PPP in the Middle East in this field, built Ajman's entire wastewater collection network and treatment facilities, which were previously non-existent. ASPCL operates this infrastructure and continues to expand them by integrating new technologies. The plant has capacity to treat 148,000 m³ of wastewater a day and services a population of 550,000 people. As operator, BESIX also contributes to collection services, customer support and billing. This ensures continuous improvement of the plant to achieve optimal performance, thus reducing operating expenses. The plant operates 24/7 with an advanced management system, including preventive maintenance.