BESIX Invest

State-of-the-art sewage sludge treatment plant will recover energy from the wastewater of 4 million citizens in Flanders

Water treatment company Aquafin is to build a sewage sludge processing installation on the ArcelorMittal site in the port of Ghent, to be operational by 2027. Both companies will utilise the green energy produced to further reduce their CO_2 impacts. Aquafin is also planning the large-scale recovery of phosphorus which is used in fertiliser, among other things. The contract for the design, construction, and financing of the installation, and maintenance until 2046, has been awarded to the BESIX-Indaver consortium.

Project details

Mono-treatment plant for sludge derived from urban wastewater treatment

Location
Ghent, Belgium

Client
Aquafin

Partner
Indaver (50/50)

Contract type
DBFMO

EPC
2023 - 2026

O&M
20 years

Contract value
€150 million

Maximum recovery of energy and materials

The purpose of the installation is to process the biomass that remains after the purification of domestic wastewater. This biomass, created by the growth of the purifying micro-organisms, contains a wealth of energy and raw materials. The new treatment plant in Ghent should be operational by 2027, and will make additional use of the biomass delivered to it. As this is a mono-processor, the sludge will not be diluted with other substances, enabling efficient maximum recovery of energy and raw materials.

Partnership

Using a European tender procedure with competition-oriented dialogue, Aquafin hunted for a partner for the design, construction, financing, and maintenance of the mono-processor. The Design, Build, Finance, Maintain & Operate (DBFMO) contract was awarded to the BESIX-Indaver consortium, which set up the Special Purpose Vehicle 'FOSTER' for this purpose.

Indaver and BESIX are two international, respected, and value-driven industrial partners on the Belgian market. Each has already successfully completed numerous large-scale industrial projects in their respective specialist fields, in both Belgium and abroad. A key shared priority is the creation of added value for the customer and society by putting first their care for people, safety, and the environment. To make a success of this sludge mono-processor project, the two firms are purposefully and skilfully combining their largely complementary knowledge and experience.

Pierre Sironval, CEO of BESIX Group: "BESIX is particularly proud to have been selected for the design, construction, financing, operations, and long-term maintenance of this state-of-the-art mono-combustion sludge treatment plant. The installation is exemplary in terms of circularity and net environmental impact. BESIX has built up a global portfolio of different industrial projects of similar or greater size that take advantage of the diversity of expertise available in the group: project financing, design, engineering, environmental considerations, construction, operations, and maintenance. We look forward to developing the project together with our partner Indaver, a top player in many different types of waste processing installations."

On the ArcelorMittal site

The location of the new installation has been determined for some time. ArcelorMittal is granting Aquafin a building within the existing site, and will purchase 100 % of the steam produced by the sludge processor. For the steel company, this is an additional green energy source for their internal steam network, further reducing the use of fossil fuels. The direct uptake of the entire steam production, combined with the focus on raw material recovery, makes this installation an exemplar illustration of circularity and environmental responsibility within Europe.

Sustainable recovery of phosphorus

In a follow-up phase, Aquafin is planning to commence full-scale phosphorus recovery, representing some 3,000 tonnes of pure phosphorus a year. By opting for mono-processing, phosphorus can be recovered more efficiently from biomass. Phosphorus is an essential building block for life and is also a basic component in mineral fertilisers for agriculture and horticulture. Phosphate ores are, however, a finite resource, with only limited supplies naturally present in Europe. Phosphorus finds its way into domestic wastewater via food, it is from here that Aquafin will resourcefully recover it with the new sludge processor.

The sludge mono-processor will carry out the end treatment of two-thirds of all Flemish sludge from domestic wastewater. The project aligns seamlessly with Aquafin's ambition to cease using fossil fuels by 2030, and to evolve towards climate-neutral business operations in the long term.

Next steps

In 2023, efforts were focused on designing the project and securing the environmental permit. The application was officially deemed complete and acceptable by the authorities in the latter half of the year. Detailed engineering work is scheduled for 2024, preparing for the commencement of construction. This is anticipated to begin towards the end of 2024, with operation initiating in 2027.

> **"BESIX is incredibly proud to be involved in this outstanding PPP project in which we can present our extensive expertise in project finance, design, engineering, environmental processes, construction, operations, and maintenance.**
>
> Tom Neyrinck, General Manager BESIX Invest