



HYOFFWIND

Brugge

A new production facility for renewable hydrogen



Status

2022 - 2026



Services:

Industrial MEP, Civil Engineering



Sectors:

Civil works: Industrial plants



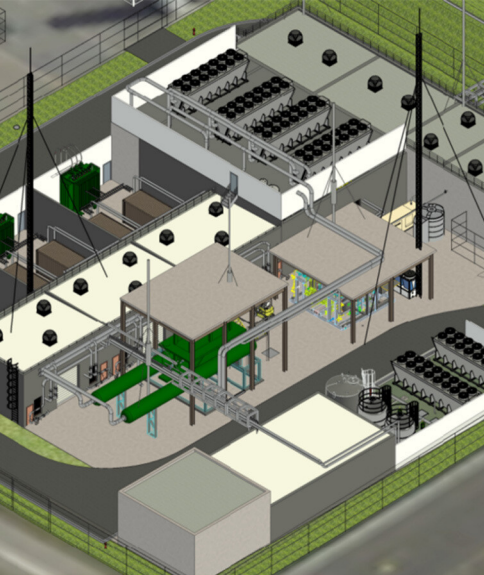
Client:

NV BESIX S.A.



Construction budget:

80,000,000 EUR



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In the port of Zeebrugge, construction of Hyoffwind is being completed around this time. It is the first large-scale production facility for green hydrogen in our country. The electrolyzers with a capacity of 25MW will produce 3,700 tonnes of green hydrogen annually, resulting in an expected CO2 reduction of 25,000 tonnes per year. BM Engineering Group was responsible for the design and detailing of the foundations, technical buildings, infrastructure & sewerage, and the building services on the site. Hydrogen is a particularly explosive gas, making safety crucial in the design of this project.

The Civil department of BM Engineering Group was responsible for the design of the buildings on the site. The most eye-catching is the compressor building with the HP and LP compressors. Based on a dynamic explosion study by a specialised partner (Gexcon), BM Engineering Group tailored the dimensioning of the structure to potential explosion loads. The roof structure also required special attention. Because hydrogen rises in the event of a leak, the structure was designed so that no cavities are created in which the gas can accumulate. This required close coordination between the Civil department and the Industrial MEP engineers.

In addition to the buildings, we also designed the complete site infrastructure. One large anti-explosion wall protects the surrounding businesses in the event of a safety incident. For the design of the roads and sewerage, a less conventional infiltration facility was chosen. Rainwater infiltrates via prefabricated U-channels into the sub-foundation, where it is buffered. Only when this is saturated is the excess water discharged to the sewer system.

Maximum operational safety

The technical installations were also designed with maximum operational safety in mind. Our Industrial MEP department provided the necessary ventilation (with emergency power supply for the ATEX roof ventilators) for the electrolyser, (LP-HP) compressor rooms with natural supply (which can be automatically shut off via dampers linked via PLC to the automation of third-party hydrogen production) and a climate control system for a controlled temperature within the technical spaces.

We also designed the electrical installations on the site, including indoor and outdoor lighting, emergency lighting, and electricity distribution. In addition, we developed a redundant data network, which increases the operational reliability of the technical installations.

The fire protection includes a sprinkler tank with pumps and an open deluge system in accordance with FM Global, which in the event of an incident or excessively high temperature can continuously cool the hydrogen trailers for a full hour, supplemented by a hydrant loop across the site. The access control was linked to the fire detection and hydrogen detection, so that evacuation and safety procedures are automatically coordinated via a fire matrix.

The sewerage system also takes possible incidents into account. In the event of a leak of hydrogen-related chemicals, automatic shut-off valves can immediately interrupt the discharge, so that liquids are captured in a retention zone. They therefore cannot enter the soil.

Integrated approach

The technical principles were fully developed and coordinated between the Civil and Industrial MEP teams, so that structures, pipework, and technical installations connect perfectly to one another. This integral approach is reflected, among other things, in the detailing of penetrations in the concrete structures

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via 3D. Each opening was individually developed, dimensioned, and provided with the correct fire-resistant sealing, tailored to the type of pipe and the material running through it. The execution dossier we prepared for this achieves a high level of detail, down to the level of formwork and reinforcement plans and P&ID diagrams with tagging for all utilities.

The production facility currently has a capacity of 25 MW, but the entire design is prepared for a later expansion to 100 MW. This way, additional installations can be integrated without major structural modifications.

Design partners

Client: Virya Energy, in collaboration with HyoffGreen and Messer

Contractor: consortium BESIX, BESIX Environment, John Cockerill Hydrogen

Civil and Industrial MEP: BM Engineering Group