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Elia pulls 380-kV high-voltage cables under the Boudewijnkanaal

Elia is currently busy laying 380-kV high-voltage cables in a tunnel under the Boudewijnkanaal in Zeebrugge. The underground 380-kV cable, a first for Belgium, stretches 10 kilometres and partly runs through a tunnel under the Boudewijnkanaal. It is part of the Stevin project, which aims to bring wind power generated by offshore wind farms to the mainland, strengthen the region's supply and make it possible to exchange energy with the UK via the subsea Nemo cable.

An underground 380-kV cable: unique in Belgium

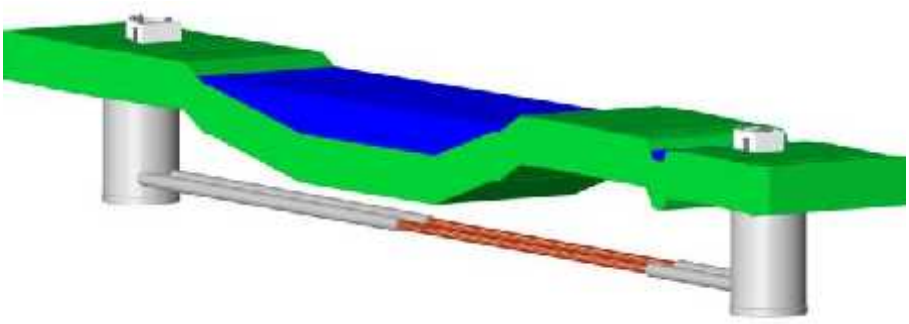
The tunnel under the Boudewijnkanaal is part of a new underground 380-kV connection spanning 10 kilometres. This is a first for Belgium and the size and capacity of this undertaking is rarely seen elsewhere in the world. The junction with the Boudewijnkanaal via a tunnel makes it even more of a challenge.

As Arianne Mertens, Stevin project manager, explains: *"The 380-kV line was laid underground in consultation with the Flemish government to avoid the densely populated area of Bruges and the special protection zones under the Birds Directive. Its maximum length was set at 10 kilometres owing to the complexity of establishing an underground connection at this voltage level and capacity as well as the fact that experience in this sort of undertaking is limited globally."*

Why a tunnel?

There were two reasons to decide to traverse the Boudewijnkanaal via a tunnel rather than turning to directional drilling. Firstly, there was insufficient space to drill to a depth of 32 metres. Secondly, the heat generated by the cable cannot dissipate adequately at such a depth, which would negatively impact transmission capacity. In a tunnel, the cables can be cooled down thanks to additional ventilation.

The tunnel connects the two banks of the Boudewijnkanaal at the Herdersbrug plant. A tunnel shaft 14 metres in diameter is located on both sides of the canal. Two ducts are situated at a depth of 32 metres and each houses six new underground 380-kV cables. Once the work is complete, the tunnel will no longer be accessible to the public. Only a small tunnel building will be visible on the surface.



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The Stevin project

The Stevin project between Zomergem and Zeebrugge comprises a double connection with the highest voltage level in Belgium (380 kV). The high-voltage line runs partly above ground (37 km) and partly below ground (10 km). In addition to the overhead lines and cables, three new high-voltage substations have been built: the Stevin substation in Zeebrugge, Gezelle in Bruges (close to Herdersbrug) and Van Maerlant in Vivenkapelle (Damme).

Work on the new connection began in 2015 and will last until late 2017. Once the new line is completely operational, work will begin on dismantling 53 km of old lines, 35 km of which will be brought underground. This work will continue until 2020. The Stevin project is extremely important:

- It guarantees an enhanced electricity supply in West and East Flanders, particularly for the port of Zeebrugge.
- The Stevin line enables wind power generated offshore to be brought to the mainland and transported throughout Belgium. Other sustainable generation units (such as wind energy and CHP units) in the coastal region will be connected to the line.
- Thanks to the new line, from 2019 onwards electricity will be exchanged with the UK via a subsea cable (the Nemo Link project).

Creating the new 380-kV connection costs approximately €270 million, while the total cost of the project, including all associated modifications to the existing high-voltage grid, is estimated at €340 million.

About Elia

The Elia Group is organised around two electricity transmission system operators (TSOs): Elia Transmission in Belgium and – together with Industry Funds Management (IFM) – 50Hertz Transmission, one of the four German TSOs, active in the north and east of Germany.

With more than 2,100 employees and a transmission grid comprising some 18,300 km of high-voltage connections serving 30 million end users, the Elia Group is one of Europe's top five TSOs.

It efficiently, reliably and securely transmits electricity from generators to distribution system operators and major industrial consumers, while also importing and exporting electricity from and to neighbouring countries. The Group is a driving force behind the development of the European electricity market and the integration of energy generated from renewable sources.In addition to its TSO activities in Belgium and Germany, the Elia Group offers businesses a range of consultancy and engineering services through its subsidiary Elia Grid International (EGI).

The Group operates under the legal entity Elia System Operator, a listed company whose core shareholder is the municipal holding company Publi-T.