Project Sheet

FR-BE: Avelin/Mastaing-Avelgem-Horta HTLS

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Key Information

Cross Border Project
AC transmission line
Upgrade

Under Construction

Description

The project consists in the reconductoring of the existing 80km double-circuit 400kV AC cross-border line between Lille (Avelin/Mastaing, FR) - Avelgem (BE) and onwards to Zomergem (Horta, BE) with High Temperature Low Sag conductors to double its capacity.

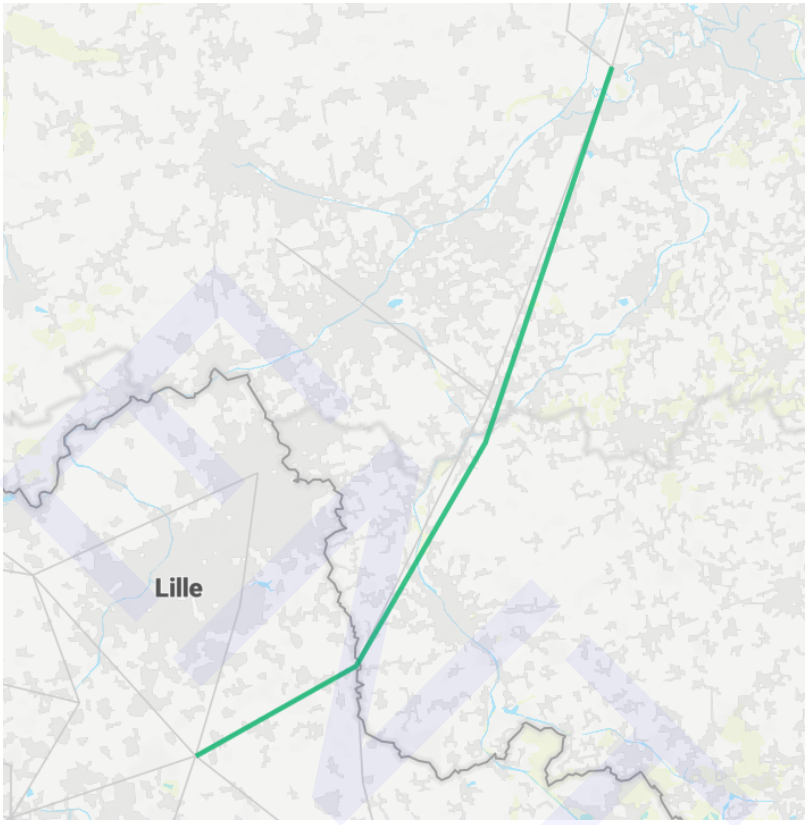
The main driver is relieving congestion on the French-Belgium border resulting from higher power flows within the CWE area, transporting energy through and to Belgium. Today this axis is occasionally a bottleneck in day-ahead flow-based market coupling. Given the expected increase in power flows, it will become a structural bottleneck. Increasing the interconnection capacity between France and Belgium creates synergies between the export position of France in favorable meteorological conditions and the import position of Belgium with higher flows from south (France) to north (Belgium) appearing more frequently on the French-Belgium border. The reinforcement of the section between Avelgem & Horta is part of the project and needed not only to sustain higher flows from France to Belgium but also to evacuate energy in case of high infeed from offshore wind or import from the UK.

Project promoters

ELIA
RTE

Countries

Belgium
France



National development plan(s)

NDP1, Belgium, 2015-2025, p.84, NDP2, France, SDDR (Schéma Décennal de Développement du Réseau -Ten Year Network Development Scheme), 2019, project n°378, page 439, https://www.rte-france.com/fr/article/evolution-du-reseau-electrique-francais-l-horizon-2035

Additional information on the project

More information about the project can be found via following these links:

- Project website:
https://www.elia.be/en/infrastructure-and-projects/infrastructure-projects/avelgem-avelin

- National Development Plan:
https://www.elia.be/-/media/project/elia/elia-site/infra-and-projects/investment-plans/federal-development-plan-2020-2030/nl/20190516_federaal-ontwikkelingsplan_nl.pdf?la=en

Project sheet backlog

6 Nov. 2020 - Publication as part of the draft TYNDP 2020 package for consultation

Project Description & Context

Project Investments

Main investment(s): Replacement of the current conductors on the axis Avelin/ Mastaing - Avelgem - Horta with high performance conductors (HTLS = High Temperature Low Sag)

Type of element	Total route length (km)	From substation 1	To substation 2	Present status	Commissioning year	Progress of the investment	Explanation in case of delay or reclustering
AC transmission line	80	Avelin/ Mastaing (FR)	Horta (BE)	Under Construction	2022	Rescheduled	Rescheduled due to technical issue on HTLS cable

Is the project in the reference grid?

Yes

System Needs addressed by the project

Project promoter(s) selected up to 4 system needs that are addressed by their project in a predefined list. Available needs ranged from reduction of price differentials between countries, improvement of system flexibility and stability, enabling cost-efficient connection of high volumes of RES, improvement of voltage stability...
As part of the TYNDP 2020, ENTSO-E released a study investigating cross-border system needs in the 2030 and 2040 horizons.

Need		How the project addresses each need (explanation provided by the project promoter(s))
€	Infrastructure to reduce price differentials between EU and/or non-EU countries	This project increases the degree of interconnectivity between Belgium and France. The possibility of higher market exchanges between these two bidding zones leads to a higher price convergence in more hours yearly and reduces therefore the price differentials. This is also included as key trigger of the 2030 interconnection criteria.
	Infrastructure to address system adequacy deficiencies and/or mitigate the risk of power failures.	France and Belgium face decreasing figures of installed conventionals due to reduction or phaseout of nuclear and bad market conditions for other

Need		How the project addresses each need (explanation provided by the project promoter(s))
		conventionals. The interconnector contributes to meet adequacy not only in both countries but also in the entire CWE-region.
ITEG	Infrastructure to tackle a Need identified by one of the European ITEG indicators referring to the 15% interconnection target for 2030:1. Reduce the price differential between EU countries to below 2EUR/MWh.2. Contribute to pushing ratio between nominal transmission capacity and installed RES capacity past 30%.3. Contribute to pushing ratio between nominal transmission capacity and peak load past 30%.	Based on IOsN report, 15% IC-target requires higher cross border transmission capacity. This project contributes to satisfy this need, provided that the project benefits outweigh its costs.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	RES integration implies higher flows in the meshed AC-grid and thus increases the need for cross border transmission capacity. This project satisfies this need in a cost-efficient manner.

Interconnection targets

In 2017, the Interconnection Target Expert Group proposed alternative indicators to the 15% interconnection criteria for every country and electrified island with a new methodology developed collaboratively between the European Commission, ENTSO-E, ENTSOG, industry, universities and other experts. The methodology is based on three indicators:
1. Price differential between EU countries, with an objective to reduce it below 2 EUR/MWh
2. Ratio between nominal transmission capacity and installed RES capacity, with a target of past 30%
3. Ratio between nominal transmission capacity and peak load, with a target of past 30%

The following maps show the ITEG methodology applied to the TYNDP 2030 scenarios, with the 2020 grid.

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Project Assessment

Transfer capacity increase (National Trends 2025)

	Border	A B	B A
Transfer capacity increase (in MW)	France - Belgium	1000	1000

CBA results

ENTSO-E has assessed the benefits delivered by each project in 2025 (scenario National Trends 2025) and in 2030 (three scenarios: National Trends, Distributed Energy and Global Ambition). Indicators B1 to B6 were computed by ENTSO-E, while promoters had the possibility to compute and submit so-called project-level benefits (B7 to B10). The benefits must be understood as benefits for Europe as a whole, not for the promoters of the project.
Results are presented per scenario.

This project chose not to request a cost-benefit analysis in the TYNDP 2020. The possibility to opt out of the CBA was offered to projects under construction or to very long-term project commissioning after 2035.

Non scenario-dependent indicator(s)

B8.0 Stability (Transient, Voltage and Frequency Stability)	Transient stability	Voltage stability	Frequency stability	
FR-BE I: Avelin/Mastaing-Avelgem-Horta HTLS (AC line high temperature conductor/ conductor replacement (e.g., duplex to triplex))	-	-	0	Qualitative assessment by ENTSO-E based on information on the project technology provided by the project promoter(s). This indicator is not dependent on scenarios or time horizons.

Residual impact

Information on the residual impact of the project was provided by the project promoter(s).

Residual environmental impact

Investment	Investment status	Distance (km)	Type of sensitivity
FR-BE I: Avelin/Mastaing-Avelgem-Horta HTLS	Under Construction	3	Habitats Directive (92/43/EEC)

Residual social impact

Investment	Investment status	Distance (km)	Type of sensitivity
FR-BE I: Avelin/ Mastaing-Avelgem-Horta HTLS	Under Construction	35	Sensitivity regarding population density - Land that is close to densely populated areas

Project Costs

The project costs were provided by the project promoter(s).

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
60. FR-BE I: Avelin/Mastaing-Avelgem-Horta HTLS	165	5%	0.4
Total	165		0.4

Explanation provided by the project promoter on the CAPEX uncertainty range:

60 Considering project status, marginal uncertainties continue to exist regarding CAPEX estimations. These uncertainties are mainly related to potential cost add-ons/reductions that only become apparent closer to the realisation of the project.