Project Sheet

France-Alderney-Britain

Project type	transmission
Project id	153
Created by	
Created on	Feb 8, 2021 3:32:28 PM

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Key Information

Cross Border Project
Offshore DC transmission cable
New

PCI number 1.7.1 (4th list, 31 Oct. 2019)
In Permitting

Description

France-Alderney-Britain (FAB) is a new HVDC subsea interconnector between Exeter (UK) and Menuel (France) with 1,4 GW capacity.

Motivation for the project :

The project has two main objectives. The first one is to increase the interconnection capacity between France and Great Britain, to answer the market needs. The second objective is to integrate additional RES generation : Wind generation in Great Britain and the project is also designed to provide a route to connect future marine renewable energy planned to be constructed in the seas around Alderney. This could form part of future offshore meshed grids (e.g. North Sea Offshore Grid) and operate with multi-terminal capability.

Project promoters

FABLINK limited
RTE
Transmission Investment

Countries

France
United Kingdom

National development plan(s)

NDP1, UK, n°153, 2017 , page 21 - NDP2, France, SDDR (Schéma Décennal de Développement du Réseau -Ten Year Network Development Scheme), France, 2019, project n°127, page 442, https://www.rte-france.com/fr/article/evolution-du-reseau-electrique-francais-l-horizon-2035

Additional information on the project

More information related to the project can be found on internet platforms :
http://www.fablink.net
and
https://www.rte-france.com/fr/projet/interconnexion-france-aurigny-grande-bretagne-fab
.

The project is also part of both System Operator National Development Plans.

In addition, FAB project has been confirmed on 31st of October 2019 as Project of Common Interest 1.7.1 in the priority corridor Northern Seas Offshore Grid (NSOG).

Project sheet backlog

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

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Project Description & Context

Project Investments

Main investment(s): France-Alderney-Britain (FAB) is a new 220km-long HVDC subsea interconnection between Exeter (UK) and Menuel (France) with VSC converter station at both ends. Expected rated capacity is 2*700 MW.

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
Offshore DC transmission cable	220	Menuel (FR)	Exeter (GB)	In Permitting	2025	Delayed	Delayed due to uncertainty of regulatory decisions

Is the project in the reference grid?

No

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	FAB Link will provide cross border capacity facilitating further access between French and GB markets thereby converging GB and French prices.
	Infrastructure to address system adequacy deficiencies and/or mitigate the risk of power failures.	The GB and French generation mixes are fundamentally different and both are forecast to undergo significant change over the assessment period. FAB Link will provide further capacity between these two markets enhancing security of supply and

Need		How the project addresses each need (explanation provided by the project promoter(s))
		reducing the risk of power failures.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	With increasing levels of RES forecast for both France and GB, FAB Link will support the integration and provide these generators access to wider markets thereby reducing the chance of curtailing these carbonised sources of power.
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%.	FABLink will further contibute to the GB 15% interconnection target and support reducing price differentials.

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 - United Kingdom	1400	1400

Boundary capacity diagram

Network boundary the projects helps mitigate

Great Britain – Continental Europe and Nordics

Boundary capacity diagram

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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.

Central scenario: National Trends

National Trends is the central policy scenario of the TYNDP2020, designed to reflect EU member state's National Energy and Climate Plans (NECP), in line with the requirement to meet current European 2030 energy strategy targets.

			Comparison of the COP21 scenarios with NT2030 average result		
	NT2025	NT2030	DE2030 is < or > than NT2030	GA2030 is < or > than NT2030	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M € / year)	max average min	32 29 27	109 105 99	>	>	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	11 9 7	40 39 38	>	>	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	max average min	2 1 1	15 11 3	<	<	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	-1099	-2180	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-56	-96	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	-1325	-2148	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	6387	31376	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	-69	-138	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	6431	31506	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)		max average min	-317 -371 -458	-1365 -1390 -1433	< 	>>>>	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M € / year)	CO2 price	60€/ ton 100€/ ton 189€/ ton	14 29 62	44 100 224	<<<<<>>	<<<<<<<	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)		average	151	316	n/a	n/a	ENTSO-E assessment
B2b_€ Annual Societal cost variation resulting from CO2 variation from network simulation monetised (M € / year)	CO2 price	60€/ ton 100€/ ton 189€/ ton	-6 -12 -25	-10 -23 -51	n/a	n/a	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)		max average min	41 30 19	426 308 92	<<<<<

year)					

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		3660	n/a	n/a	ENTSO-E assessment
B6_€ Annual Socio-Economic Welfare increase resulting from reduction in Energy Not Served monetised (M€ / year)	average	n/a	36.6	>	n/a	ENTSO-E assessment

Scenarios: Distributed Energy & Global Ambition

DE and GA are two scenarios created in line with the COP21 targets to understand the impact on infrastructure needs agains different pathways reducing EU-28 emissions to net-zero by 2050. For these two scenarios, projects were assessed with a subset of CBA parameters.

		DE2030	GA2030	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M€ / year)	average	259	134	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	109	44	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	1	7	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market	average	-2064	-1259	ENTSO-E assessment

simulation (ktonnes / year)				
B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M€ / year)	CO2 price	60€/ ton 100€/ ton 189€/ ton	14 97 281	31 82 194	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	37	162	ENTSO-E assessment
B3a Connected RES (MW)	-			ENTSO-E assessment

Non scenario-dependent indicator(s)

B8.0 Stability (Transient, Voltage and Frequency Stability)	**Transient stability**	**Voltage stability**	**Frequency stability**	
France-Alderney-Britain (New HVDC)	++	++	+ (between sync areas)	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.

Sensitivity Study: Current Trends

'Current Trends' describes a future where the energy transition is slower than planned.

	CT2030	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M€ /	average	47	ENTSO-E assessment

year)			
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	13	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	1	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-465	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M€ / year)	CO2 price	60€/ ton 100€/ ton 189€/ ton	15 33 75	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	12	ENTSO-E assessment
B3a Connected RES (MW)	-		ENTSO-E assessment

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
France-Alderney-Britain	In Permitting	10	Habitats Directive (92/43/EEC)

Residual social impact

Investment	Investment status	Distance (km)	Type of sensitivity
France-Alderney-Britain	In Permitting	0	

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
987. France-Alderney-Britain	870	+/- 27%	7.6
Total	870		7.6

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

987 CAPEX figures provided are consistent with those provided for PCI monitoring purposes and pre-procurement estimates. Due to confidentiality restrictions in our ongoing procurement process these have not been updated