Project Sheet

Britib

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Key Information

Cross Border Project
Offshore DC transmission cable
New

Under Consideration

Description

EU Priority Corridor: NSI West Electricity.

Category: Electricity Highway.

Acronym: Bretagne-Britain-Iberia (BritIb).

Interconnection project between South-West England (United Kingdom), Cordemais (France) and Basque Country (Spain) in a multiterminal HVDC configuration of 525-600 kV with 3 inputs/ outputs of 1800 MW each, and a mostly subsea route from Spain to Great Britain along the French coast of about 1330 km in total.

The project's development started in 2009 and is aligned with the EU Parliament priorities established in EU Regulation 347/2013 (Annex I): NSI West Electricity corridor (2) and e-Highways area (11).

The Britib project was included in TYNDP 2014, 2016 and 2018.

Project promoters

ACS Cobra

Countries

Spain
France
United Kingdom

National development plan(s)

The project is not included in a National Development Plan.

Additional information on the project

The project's development started in 2009 and is aligned with the EU Parliament priorities established in EU Regulation 347/2013 (Annex I): NSI West Electricity corridor (2) and e-Highways area (11).

- The project links two isolated regions (UK-Ireland and Spain-Portugal) with high share of intermittent renewables (and low weather correlation) between them and with Central EU Grid through the strong Northern France grid.

- The project allows for the large-scale integration of RES in Europe, where the high complementarity of resources between regions enables solar power from Spain-Portugal towards Northern Europe in summer and significant exchange of wind power between the Northern Sea region and Spain-Portugal, particularly in winter.

- It links convenient connection points with little need of grid reinforcement and very low environmental impact.

- Technological breakthrough for the European industry: longest subsea power cable in the world, flexible multiterminal configuration.

- The socio-economic benefits of the project more than justify the cost in each of the countries directly involved (even without considering existing indirect benefits to their respective neighbouring countries).

- The European Council called for its urgent implementation through the Common Strategy Paper signed by the national TSOs (RTE, REE, REN) to achieve the 10% interconnection target.

- In addition, both RTE and NGET were directly involved in the feasibility study of the project.

- It was included in the National Development Plans of: France (Final SDDR 2014 and 2016), Spain (draft 2012-2020 previous to existing 2015-2020) and UK (Final ETYS 2014).

- Britib project was included in previous ENTSO-E's TYNDP 2014 and 2016 (project 182 and 296 respectively).

- The project has a recognised "pan-European impact" according to EU Regulation 347/2013, which was confirmed in all previous PCI assessment processes of 2013, 2015 and 2017.

- Finally, the project was financed with the TEN-E 2011 program by the European Commission for part of its feasibility study, with the support of Spain and United Kingdom.

The following studies were performed with the support of the European Commission's TEN-E 2011 program:

- Connection points and network feasibility studies
- Facilities electromechanical implementation
- Configuration and converter technology assessment
- Cable technology, lossess and deployment assessments
- Land environmental study
- Cable route high-level feasibility study
- Cable route desktop evaluation and sea environmental assessment

- Economic analysis and financial modeling
- Cost-Benefit Analysis
- Legal and regulatory analysis

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): Interconnection project between South-West England (United Kingdom), Cordemais (France) and Basque Country (Spain) in a multiterminal VSC HVDC bipole configuration of +/- 500-600 kV with 3 inputs/outputs of 1800 MW each, and a mostly subsea route from Spain to Great Britain along the French coast of about 1330 km in total.

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	1330	Gatica/ Hernani (Spain), Cordemais (France) and Langage/ Indian Queens (United Kingdom)	Gatica/ Hernani (Spain), Cordemais (France) and Langage/ Indian Queens (United Kingdom)	Under Consideration	2026	Rescheduled	Awaiting PCI status

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.

The project promoter did not select any need.

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	1800	1800
Transfer capacity increase (in MW)	Spain - France	1800	1800
Transfer capacity increase (in MW)	Spain - United Kingdom	1800	1800

Boundary capacity diagram

Network boundary the projects helps mitigate

Great Britain – Continental Europe and Nordics & Iberian Peninsula integration

Boundary capacity diagram

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	94 92 89	275 254 233	>	>	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	16 14 13	76 71 68	>	>	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	max average min	14 13 12	181 175 169	>	<	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	-2183	-4435	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-165	-223	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	-2248	-4397	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	13144	11718	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	-139	-294	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	13208	11962	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)		max average min	-564 -612 -690	-2419 -2543 -2718	< 	><	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	23 47 102	81 183 409	< < >	< < <	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)		average	10	153	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	0 -1 -12	-5 -11 -25	n/a	n/a	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)		max average min	310 271 236	4963 4698 4433	< < 	< < 	ENTSO-E assessment
B3a Connected RES (MW)	-				n/a	n/a	ENTSO-E assessment

Impact on grid losses

B5 Variation of network losses (GWh / year)		average	253	952	n/a	n/a	ENTSO-E assessment
B5_€ Variation of network losses monetised (M€ /		average	-1	16	n/a	n/a	ENTSO-E assessment

year)					

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		4555	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	45.55	>	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	456	287	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	163	82	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	210	155	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market	average	-3069	-2334	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	21 144 417	58 152 359	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	4247	3635	ENTSO-E assessment
B3a Connected RES (MW)	-			ENTSO-E assessment

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€ / year)	average	124	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	26	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	40	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-933	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	30 67 150	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	750	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).

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
1437. Britib	2040	+/- 10%	20
Total	2040		20

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

1437 Uncertainty range depending on final procurement's market conditions.