Project Sheet

Kriegers Flak CGS

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Key Information

Cross Border Project
Off-shore AC transmission cable
New

Under Construction

Description

The Combined Grid Solution (CGS) is a new AC offshore connection between Denmark and Germany with back to back stations placed in Germany.

Project promoters

Energinet.dk
50HERTZ

Countries

Germany
Denmark

National development plan(s)

Germany: NEP2030 v2017 p.421 Denmark: RUS-plan 2018 p. 24, 26, 32 and 37

Additional information on the project

Project Websites:

https://energinet.dk/Anlaeg-og-projekter/Projektliste/KriegersFlakCGS

https://en.energinet.dk/Infrastructure-Projects/Projektliste/KriegersFlakCGS

http://www.50hertz.com/en/Grid-Extension/Offshore-projects/Projects/Combined-Grid-Solution

3rd PCI list:
https://ec.europa.eu/energy/sites/ener/files/documents/annex_to_pci_list_final_2017_en.pdf

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): Four offshore windfarms connected to shore combined with 400 MW interconnection between both countries. New technical solution connecting 220 and 150 kV AC offshore grid and onshore HVDC VSC Back-to-Back Converter.

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
Off-shore AC transmission cable	24	Ishøj / Bjæverskov (DK)	Bentwisch (DE)	Under Construction	2020	Delayed	Difficulties during construction

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	Project connects two market areas (DKE and DE) with high price differentials between EU countries.
	Infrastructure to address system adequacy deficiencies and/or mitigate the risk of power failures.	The projects contributes both, generation capacity and interconnection capacity to mitigate challenges in the DKE system.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	The projects enables direct cost-efficient connection of 936 MW offshore wind.

Need		How the project addresses each need (explanation provided by the project promoter(s))
	Infrastructrure improving voltage stability by offering reactive power controllability of converters by system operator(s)	The project increases system voltage stability by usage of VSC technology and facilitates independent control of active and reactive power.

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)	Denmark - Germany	400	400

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.

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
141. Kriegers Flak CGS	320	20	16
Total	320		16

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

141