Project Sheet

GerPol Power Bridge II

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Key Information

Cross Border Project
Internal Project
AC transmission line
New

Under Consideration

Description

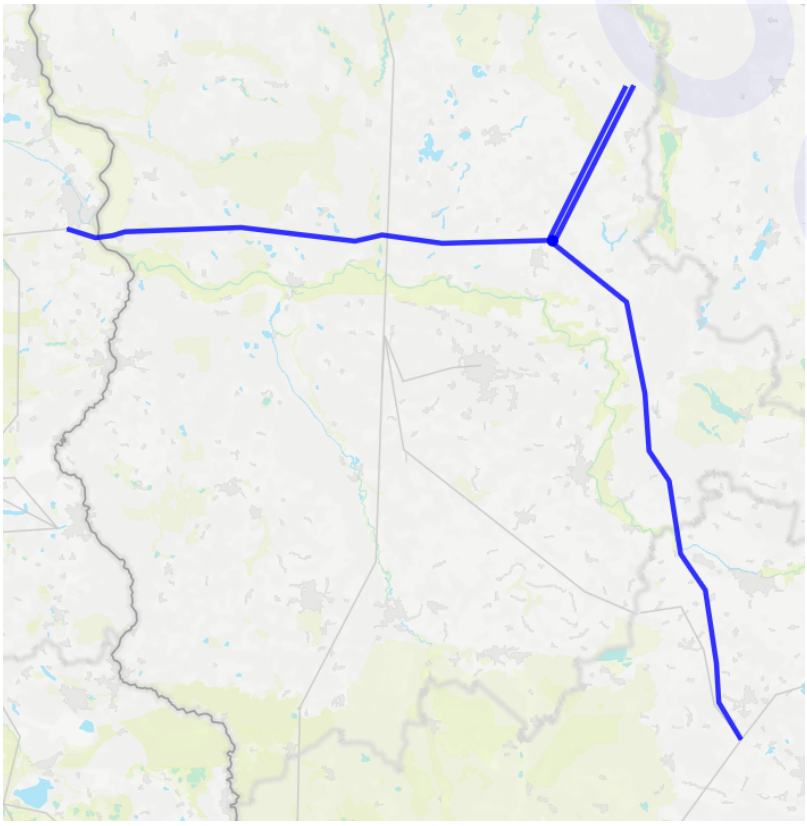
Project consist from following investments: indentation to the one circuit of 400 kV line Baczyna-Plewiska (new routes 400 kV: Baczyna-Zielona Góra, Zielona Góra-Plewiska), crossborder line 2x400 kV line Zielona Góra (PL)-Eisenhuettenstadt (DE), new station Zielona Góra (with Phase Shifting Transformers), new 2x400 kV line Zielona Góra - Polkowice.

Project promoters

Polskie Sieci Elektroenergetyczne S.A.
50HERTZ

Countries

Germany
Poland



National development plan(s)

Germany: NEP2024 p.153 // Poland: Link to PSE S.A. Development Plan where investments of this project are included:
https://www.pse.pl/documents/20182/8c629859-1420-432f-8437-6b3a714dda9c?safeargs=646f776e6c6f61643d74727565
Pages : 54, 58.

Additional information on the project

Link to PSE S.A. Development Plan where investments of this project are included :
https://www.pse.pl/documents/20182/8c629859-1420-432f-8437-6b3a714dda9c?safeargs=646f776e6c6f61643d74727565

Pages: 54, 58.

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): Construction of new crossborder 2x400 kV line between new substation Zielona Góra (PL) end existing substation Eisenhuettenstadt (DE)

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	Zielona Góra	Eisenhuettenstadt	Under Consideration	2035	New Investment	

Other investments

Description	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
Indentation to the one circuit of 400 kV line Baczyna - Plewiska (construction 40 km new 400 kV line from new substation Zielona Góra to the point of indentation). Creating new route 400 kV Baczyna - Zielona Góra.	AC transmission line	40	Baczyna-Plewiska indentation	Zielona Góra	Under Consideration	2035	Investment on time	
Indentation to the one circuit of 400 kV line Baczyna - Plewiska (construction	AC transmission line	40	Zielona Góra	Baczyna-Plewiska indentation	Under Consideration	2035	Investment on time	

Description	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
40 km new 400 kV line from new substation Zielona Góra to the point of indentation). Creating new 400 kV route Zielona Góra - Plewiska.								
Construction of new substation 400/110 kV Zielona Góra to connect 400 kV lines : Baczyna - Zielona Góra, Zielona Góra - Plewiska, Zielona Góra - Eisenhuettenstadt (with installation of Phase Shifting Transformers), Zielona Góra - Polkowice	Onshore substation		Zielona Góra	n.a.	Under Consideration	2035	Investment on time	
Construction of new 2x400 kV line from new substation Zielona Góra to existing substation Polkowice	AC transmission line	90	Zielona Góra	Polkowice	Under Consideration	2035	New Investment	

Reason for investment clustering

All investments in the 229 project complement each other in bringing the desired increase of Grid Transfer Capability on the Polish-German border. Majority of investents in this cluster connect

directly to border substation Zielona Góra and have direct impact on border flows.

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	Finalization of the GerPol Power Bridge II project allows to increase cross-border capacity on the Polish-German border and thus allows to exchange more energy.
	Infrastructure to facilitate and accommodate future scenarios, cross-border flows or loop flows.	This project contributes to a reduction of unscheduled flows DE-PL, PL-CZ and PL-SK by increasing the controllability of the power flow on the DE-PL border.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	This project enables the integration of additional RES in the area of western and north-western Poland as well as in the eastern part of Germany.
	Infrastructure to address system adequacy deficiencies and/or mitigate the risk of power failures.	Project contributes to mitigate the risk of adequacy deficiencies in Germany and Poland by connecting areas with different mix of generation.

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)	Germany - Poland	1500	1500

Boundary capacity diagram

Network boundary the projects helps mitigate

Central East integration

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.

Because its planned commissioning date is in 2035 or later, this project has only been assessed in the 2030 scenarios and based on a subset of CBA indicators.

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	43 43 43	152 148 146	<	<	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	35 35 35	92 91 90	>	<	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	max average min	16 16 16	51 48 43	<	<	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	N/A	-6694	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	N/A	-74	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	N/A	-7492	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	N/A	17997	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	N/A	-338	n/a	n/a	ENTSO-E assessment

B4f Non-methane volatile organic compounds		average	N/A	18483	n/a	n/a	ENTSO-E assessment
B2a Annual CO2 variation from market simulation (ktonnes / year)		max average min	-1540 -1540 -1540	-3220 -3245 -3271	>	>	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	57 119 256	104 234 522	< < <	< < <	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)		average	0	0	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 0 0	0 0 0	n/a	n/a	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)		max average min	308 308 308	1401 1250 1114	<	<	ENTSO-E assessment
B3a Connected RES (MW)	-				n/a	n/a	ENTSO-E assessment

Impact on grid losses

B5 Variation of network losses		average	N/A	0	n/a	n/a	ENTSO-E assessment

(GWh / year)						
B5_€ Variation of network losses monetised (M€ / year)	average	N/A	0	n/a	n/a	ENTSO-E assessment

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		N/A	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	N/A	>	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	108	82	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	96	56	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	30	22	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-1818	-1599	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	13 85 247	40 104 246	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	578	512	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	
Baczyna-Zielona Góra (New AC line)	++	++	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.
Zielona Góra - Plewiska (New AC line)	++	++	0	
Zielona Góra - Polkowice (New AC line)	++	++	0	
Zielona Góra - Eisenhuettenstadt (New AC line)	++	++	0	

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	44	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	28	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	21	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-987	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	32 71 159	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	381	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

Note based on CBA Guideline 3.0: Given that the actual route of the project might not be defined due to the low degree of maturity of its investment(s), an environmental assessment is not yet available.

Additional information by the project promoter(s)

Actual route of the project is not defined yet because of the low degree of maturity of its investments – a residual social impact assesment is not yet available.

Residual social impact

Investment	Investment status	Distance (km)	Type of sensitivity

Note based on CBA Guideline 3.0: Given that the actual route of the project might not be defined yet because of the low degree of maturity of its investment(s), a residual social impact assessment is not yet available.

Additional information by the project promoter(s)

Actual route of the project is not defined yet because of the low degree of maturity of its investments – a residual social impact assesment is not yet available.

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
1270. Baczyna-Zielona Góra	20	9%	0.057
1271. Zielona Góra - Plewiska	20	9%	0.057
1272. Zielona Góra	90.4	5%	2.712
1673. Zielona Góra - Polkowice	75	9	0.14
1674. Zielona Góra - Eisenhuettenstadt	65	9	0.13
Total	270.4		3.096

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

1270	Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process
1271	Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process

1272	Uncertainty regarding extra costs due to safety
1673	Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process
1674	Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process

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