Project Sheet

Westtirol (AT) - Vöhringen (DE)

Project type	transmission
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Key Information

Cross Border Project
AC transmission line
Upgrade

Planned But Not Yet Permitting

Description

This project will increase the current power exchange capacity between Austria and Germany by an upgrade of the existing overhead line Vöhringen (DE) - Westtirol (AT) to 380 kV and the extension of existing and errection of new 380-kV-substations including 380/110-kV-transformers.

Project promoters

AMPRION
Austrian Power Grid

Countries

Austria
Germany

National development plan(s)

Netzentwicklungsplan 2030 Version 2019, Germany, P74 M96, p. 446, Austria: APG Netzentwicklungsplan 2019, AT, 2019, 13-2, 48,
https://www.apg.at/en/Stromnetz/Netzentwicklung

Additional information on the project

http://www.apg.at/en/netz/netzausbau/Netzentwicklungsplan

https://www.netzentwicklungsplan.de/sites/default/files/paragraphs-files/Basispraesentation_NEP_2030_V2019_2_Entwurf.pdf

The project was part of the previous TYNDP 2018, Link to the Website:
https://tyndp.entsoe.eu/tyndp2018/projects/projects/47

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): Upgrade of an existing over head line to 380 kV, extension of existing and errection of new 380-kV-substations including 380/110-kV-transformers. Transmission route Vöhringen (DE) -Westtirol (AT). This project will increase the current power exchange capacity between the DE, AT.

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	157	Vöhringen (DE)	Westtirol (AT)	Planned But Not Yet Permitting	2027	Delayed	Scope of the project changed due to technical reasons.

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))
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%.	Increase of German interconnection level.
	Infrastructure to improve system flexibility and stability e.g. improve system or local ramp rate, improve transient	Better utilisation of existing and future pump

Need		How the project addresses each need (explanation provided by the project promoter(s))
	stability or RoCoF to meet system Needs.	storage power plants by improved transport capacities.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	Connecting German RES power with pump storages in Austria.

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)	Austria - Germany	600	600

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	15 11 7	34 30 23	>	>	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	6 4 2	14 12 6	>	>	ENTSO-E assessment
B1_RES Annual Socio-Economic	max average	7 6	21 19	<	<	ENTSO-E assessment

Welfare increase resulting from RES integration	min	5	14			

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	-237	3881	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	4	243	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	-310	3583	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	886	-29224	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	-7	197	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	905	-29364	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)	max average min	-104 -179 -272	-206 -420 -517	>	<	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	7 14 30	13 30 68	< < <	< > >	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)	average	71	128	n/a	n/a	ENTSO-E assessment
B2b_€ Annual Societal cost variation resulting from	CO2 price 60€/ ton 100€/	-2 -5 -12	-4 -9 -21	n/a	n/a	ENTSO-E assessment

CO2 variation from network simulation monetised (M € / year)	ton 189€/ ton					

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	max average min	161 128 110	544 493 368	< 	< 	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	141	277	n/a	n/a	ENTSO-E assessment
B5_€ Variation of network losses monetised (M€ / year)	average	5	5	n/a	n/a	ENTSO-E assessment

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		1217.14285714286	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	12.17142857	>14286	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	33	32	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	18	17	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	13	17	ENTSO-E assessment
Reduction of CO2 and GHG emissions				
B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-339	-482	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	2 16 46	12 31 74	ENTSO-E assessment
Integration of renewable energy sources				
B3 Annual avoided curtailment (RES integration) (GWh / year)	average	239	376	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	
689: Vöhringen (DE) - Westtirol (AT) (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.

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	15	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	5	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	10	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-182	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market	CO2 price 60€/ton 100€/ton 189€/	6 13 29	ENTSO-E assessment

simulation monetised (M€ / year) ton		

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year) average	180	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.

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.

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
689. 689: Vöhringen (DE) - Westtirol (AT)	174	10%	1.3904
Total	174		1.3904

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

689 Uncertainty range is needed due to uncertainties in material costs, permitting issues and unknown final routing in case of project in early planning status.