Project Sheet

CSE4

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Key Information

Cross Border Project
AC transmission line
New

PCI number 3.7.1, 3.7.2, 3.7.3 and 3.7.4 (4th list, 31 Oct. 2019)
Under Construction

Description

The project concerns the construction of a new AC 400kV interconnection between Bulgaria and Greece and new AC 400kV overhead lines at the south part of Bulgaria. This project will increase cross border transfer capacity between Bulgaria and Greece

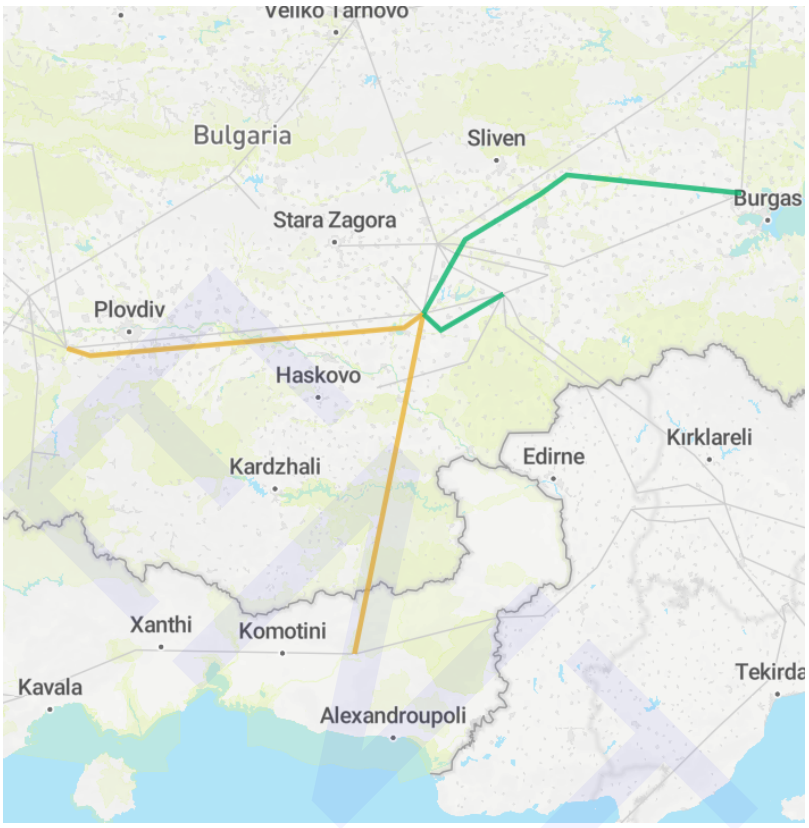
Project promoters

ESO

Admie

Countries

Bulgaria
Greece



National development plan(s)

http://eso.bg/fileObj.php?oid=2185
, Bulgaria,NDP2019, page 20,
http://www.admie.gr/fileadmin/user_upload/Files/masm/2018_2027/DPA_2018_2027.pdf
, Greece, NDP 2018-2027,page 17193

Additional information on the project

"Project website ESO (
http://projects.eso.bg/maritsa-east-nea-santa/?en#PROJECT%20OF%20COMMON%20INTEREST
)

- Project website IPTO (
http://www.admie.gr/en/transmission-system/system-development/projects-of-common-interest/project/article/2194/
)

Project 142 includes a new interconnection between Bulgaria and Greece and relevant reinforcements in the 400kV network at the south part of Bulgaria. The later are necessary in order to alleviate congestions in the area of south Bulgaria that are restricting power exchanges through the new interconnector."

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): New interconnection line BG-GR by a 151km single circuit 400kV OHL.

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	151	Maritsa East 1 (BG)	N.Santa (GR)	In Permitting	2023	Investment on time	

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
New 94km single circuit 400kV OHL in parallel to the existing one.	AC transmission line	94	Maritsa East 1 (BG)	Plovdiv (BG)	In Permitting	2022	Rescheduled	Having dificulities with acquiring the land
New 13km single circuit 400kV OHL in parallel to the existing one.	AC transmission line	13	Maritsa East 1 (BG)	Maritsa East 3 (BG)	Under Construction	2021	Rescheduled	Having dificulities with acquiring the land
New 400kV OHL. Line lengt 150km.	AC transmission line	150	Maritsa East 1 (BG)	Burgas (BG)	Under Construction	2021	Investment on time	

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	The project contributes in reducing price differentials indicated in the south part of the region by providing access to more competitive generation sources located in the northeast part.
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	The project will allow further RES integration in northeast part of Greece and in northeast and south Bulgaria.

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)	Bulgaria - Greece	930	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	18 10 4	29 19 13	>	>	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	-4 -10 -17	-13 -19 -25	>	<	ENTSO-E assessment
B1_RES Annual Socio-Economic	max average	1 0	1 1	>	>	ENTSO-E assessment

Welfare increase resulting from RES integration	min	0	0			

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	1629	1709	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-19	-32	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	2308	2257	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	110	49	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	82	94	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	-11	-105	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)		max average min	746 417 193	896 677 471	 <	 >	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 -32 -69	-22 -49 -109	>> >> >	< < <	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)		average	21	-15	n/a	n/a	ENTSO-E assessment
B2b_€ Annual Societal cost variation resulting from	CO2 price	60€/ ton 100€/	-1 -2 -4	0 1 2	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	26 8 0	36 13 3	>	>	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	22	18	n/a	n/a	ENTSO-E assessment
B5_€ Variation of network losses monetised (M€ / year)	average	1	1	n/a	n/a	ENTSO-E assessment

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		41	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	0.41	>	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	40	47	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	5	-49	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	14	13	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-92	1393	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	1 4 13	-35 -91 -214	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	269	307	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	
256 (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.

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	11	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	-7	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	0	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	232	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market	CO2 price 60€/ton 100€/ton 189€/	-7 -17 -37	ENTSO-E assessment

simulation monetised (M€ / year) ton		

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year) average	4	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
256	In Permitting	0.1	Habitats Directive (92/43/EEC)
		4.4	Birds Directive (2009/147/EC)

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
256. 256	80	+10%, -10%	1.1
257. 257	57	+10%, -10%	0.7
258. 258	7.4	+10%, -10%	0.1
262. 262	80	+10%, -10%	1.1
Total	224.4		3

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

256	Procurement/construction cost uncertainties
257	Procurement/construction cost uncertainties
258	Procurement/construction cost uncertainties
262	Procurement/construction cost uncertainties