Project Sheet

Italy-Montenegro

Project type	transmission
Project id	28
Created by	
Created on	Feb 8, 2021 2:37:24 PM

Index

Key Information 3
Description 3
Project Description & Context 4
Project Investments 4
System Needs addressed by the project 4
Interconnection targets 5
Project Assessment 9
Transfer capacity increase (National Trends 2025) 9
Boundary capacity diagram 9
CBA results 10
Central scenario: National Trends 10
Scenarios: Distributed Energy & Global Ambition 13
Non scenario-dependent indicator(s) 14
Sensitivity Study: Current Trends 14
Residual impact 16
Project Costs 16

ENTSO-E

Key Information

Cross Border Project
DC transmission line
New

Under Construction

Description

The Italy-Montenegro interconnection project includes a new HVDC subsea cable between Villanova (Italy) and Lastva (Montenegro) and the DC converter stations. The second HVDC module (600 MW) of the Italy-Montenegro interconnection project is strictly correlated with the Transbalkan (project 227) and the Mid Continental East (project 144) corridors, and therefore contributes significantly to enable the usage of an increased transmission capacity between Italy and South-Eastern European Countries (especially Romania and Bulgaria)

Project promoters

TERNA
CGES

Countries

National development plan(s)

Avanzamento Piani di Sviluppo precedenti 2015/Pag.278, Italy

Additional information on the project

PCI information:

https://www.terna.it/it-it/sistemaelettrico/pianodisviluppodellarete/progettidiinteressecomune.aspx

Link to the last release of the Italian National Development Plan:

http://www.terna.it/it-it/sistemaelettrico/pianodisviluppodellarete/pianidisviluppo.aspx

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): Second HVDC Module (600 MW) of interconnection line between Italy and Montenegro via 445 km 500kV DC subsea cable and converter stations at both ending points.

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
DC transmission line	445	Villanova (IT)	Lastva (ME)	Under Construction	2026	Rescheduled	posteponed

Reason for investment clustering

The three investments are necessary for the completion of the entire Interconnection between Italia and Montenegro which will bring a contribute to the cross-border transmission capacity of 1200 MW.

However, investments n. 70 and 624 will be eliminated because they will be commissioned in 2019

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	This project contributes to lowering the price differentials between Italian market zones Italy and Montenegro
	Infrastructure to address system adequacy deficiencies and/or mitigate the risk of	This project will contribute to reduce system adequacy deficiencies by

Need		How the project addresses each need (explanation provided by the project promoter(s))
	power failures.	increasing transmission capacity
	Infrastructure to facilitate and accommodate future scenarios, cross-border flows or loop flows.	This project will help to solve important congestions among Italian transmission grid
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	This project will improve the integration of italian RES 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.

ENTSOE

ENTSOE

ENTSOE

Project Assessment

Transfer capacity increase (National Trends 2025)

	Border	A B	B A
Transfer capacity increase (in MW)	Italy - Montenegro	600	600

Boundary capacity diagram

Network boundary the projects helps mitigate

Italy – Balkan

Boundary capacity diagram

ENTSO-E

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	19 14 10	35 31 24	<	<	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	3 -7 -17	-18 -28 -35	>	<	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	max average min	2 1 0	10 6 4	>	<	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	1177	2187	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-22	-115	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	1466	2829	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	143	-1712	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	77	101	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	22	-1970	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)		max average min	760 300 -142	1263 990 646	< <<	>>>>

year)					

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	19	22	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	11	-77	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	10	6	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market	average	-213	2206	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	1 10 29	-55 -143 -340	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	182	126	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	
Second HVDC Module IT-ME (New HVDC)	++	++	+ (between sync areas)	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€ /	average	6	ENTSO-E assessment

year)			
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	-2	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	1	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	76	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 -6 -12	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	18	ENTSO-E assessment
B3a Connected RES (MW)	-		ENTSO-E assessment

Comments on the CBA results by the project promoter(s)

About B2 - Co2 emissions:

Results relative to CO2 emissions are strictly dependent on scenario assumptions (especially lifetime of lignite and coal power plants, that should be assessed from a perspective consistent with considered time horizons 2030 and 2040).

About B6 - Annual Socio-Economic Welfare increase resulting from reduction in Energy Not Served monetised):

In Italy a different parameter is used for the monetization of the Expected Energy Not Served (EENS) variation due to this project, because the current parameter used by ENTSOE in this project sheet (10 k€/MWh) is not compliant with National regulations in force in Italy n°627/2016 ("Minimum Requirements for the preparation of the Ten Year Development Plan of the National Transmission Network" according to which benefits related to reduction of EENS is monetized through a Value of Lost Load (VOLL) in a range between 20 k€/MWh and 40 k€/MWh.

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
Second HVDC Module IT-ME	Under Construction	0	

Residual social impact

Investment	Investment status	Distance (km)	Type of sensitivity
Second HVDC Module IT-ME	Under Construction	0	

Project Costs

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

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
1503. Second HVDC Module IT-ME	362	10	0.7
Total	362		0.7

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

1503 uncertainty due to any unexpected event during the construction phase