Project Sheet

HU-RO

Project type	transmission
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Index

Key Information 3
Description 3
Project Description & Context 5
Project Investments 5
System Needs addressed by the project 5
Interconnection targets 6
Project Assessment 10
Transfer capacity increase (National Trends 2025) 10
Boundary capacity diagram 10
CBA results 10
Central scenario: National Trends 11
Scenarios: Distributed Energy & Global Ambition 13
Non scenario-dependent indicator(s) 14
Sensitivity Study: Current Trends 14
Residual impact 15
Project Costs 16

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Key Information

Cross Border Project
AC transmission line
Mostly New

Under Consideration

Description

400 kV interconnection line between Hungary and Romania. In Romania, the following internal investments are necessary associated to this project:

-new 400/220 kV transformer in substation Rosiori

-reconductoring 220 kV OH line Urechesti-Tg. Jiu-Paroseni- Baru Mare-Hasdat

-new 400/220 kV transformer in substation Resita

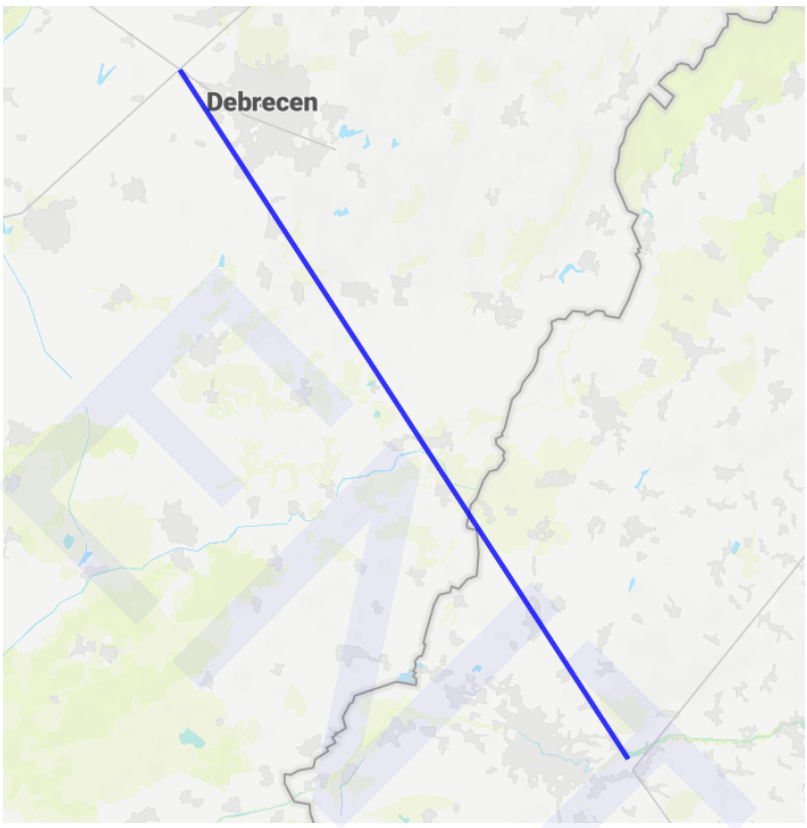
Project promoters

MAVIR

TRANSELECTRICA

Countries

Hungary
Romania



National development plan(s)

A Magyar Villamosenergia-rendszer Hálózatfejlesztési Terve 2017., Hungary, 2017, Page 6; The project is not included in the last approved Romanian NDP but it is included in the draft version of Romanian NDP (Planul de dezvoltare a RET perioada 2020-2029 - draft version) submitted in October 2020 for approval to the Romanian NRA -page 253, https://web.transelectrica.ro/noutati/noutati/55_2020.08.17_14-30-42.pdf

Additional information on the project

"The project was originally proposed by the ENTSO-E Common Planning Study performed during TYNDP 2016, which found potential when assessing against TYNDP 2014 Vision 4.

The need was confirmed during the IoSN process of TYNDP 2018, in scenarios DG2040 and GCA2040."

Project sheet backlog

5 Jan. 2021 - Specification that the project is included in the draft version of the Romanian NDP submitted to the Romanian NRA in October 2020

6 Nov. 2020 - Publication as part of the draft TYNDP 2020 package for consultation

Project Description & Context

Project Investments

Main investment(s): New 120 km single circuit 400 kV OHL between Hungary and Romania (90 km on Hungarian and 30 km on Romanian side) in order to reach the market based target capacity resulted from the TYNDP 2016 Common Planning Studies based in V4 and TYNDP 2018 IoSN in DG2040 and GCA2040. Internal investments in Romania associated to the project are also included.

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	120	Józsa	Oradea	Under Consideration	2030	Investment on time	

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	The project contributes to the increase of the transfer capacity across the border between Hungary and Romania.Increased cross-border capacities allow countries to exchange more energy and this will have an impact on reducing the marginal costs.
	Infrastructure and/or market design to provide balancing flexibility (e.g. international pooling / sharing of reserves, coordinated development of reserve capacity)	The project creates an additional energy corridor between Hungary and Romania, and it can be claimed that it will provide balancing flexibility area for both sides.

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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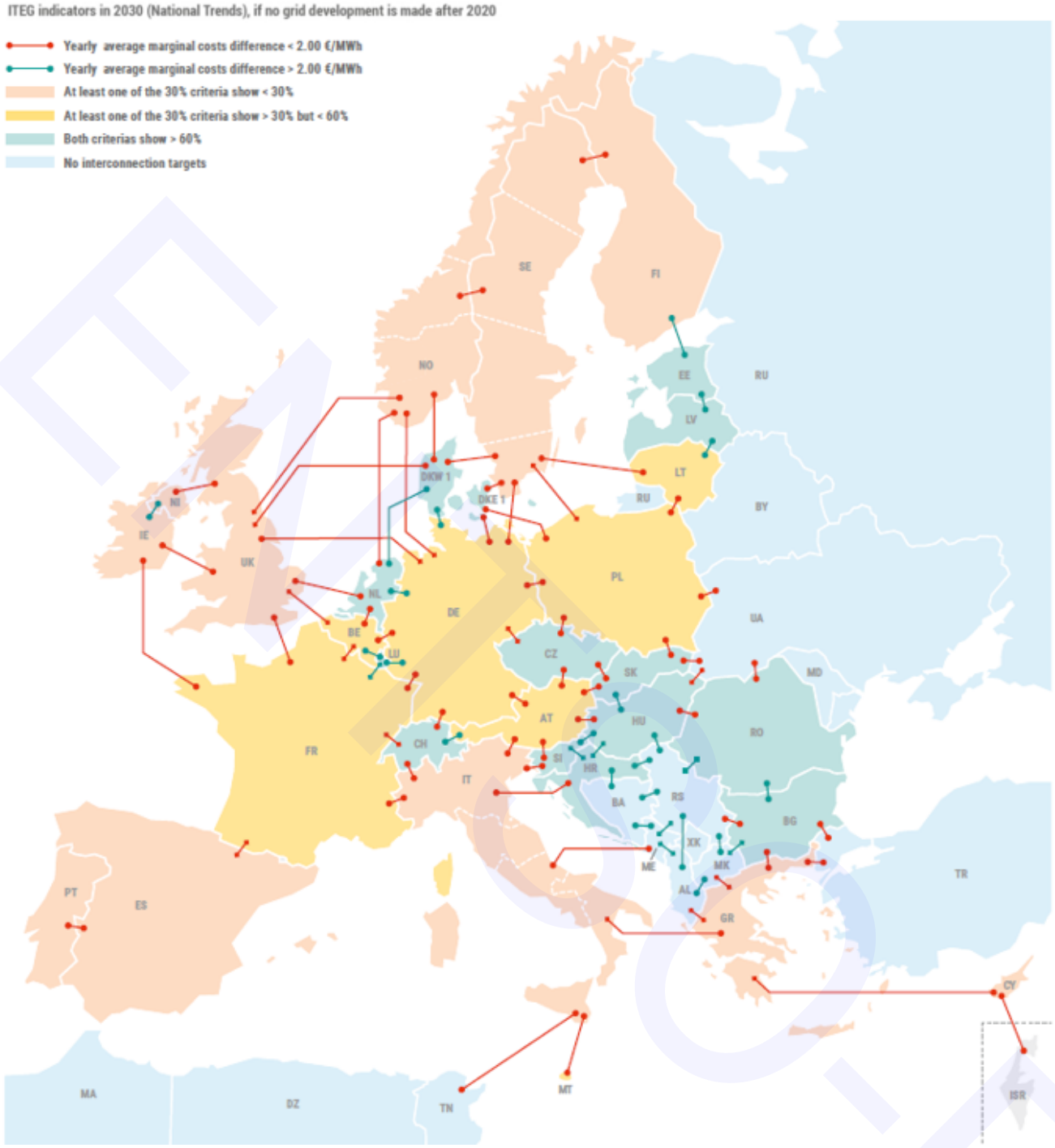
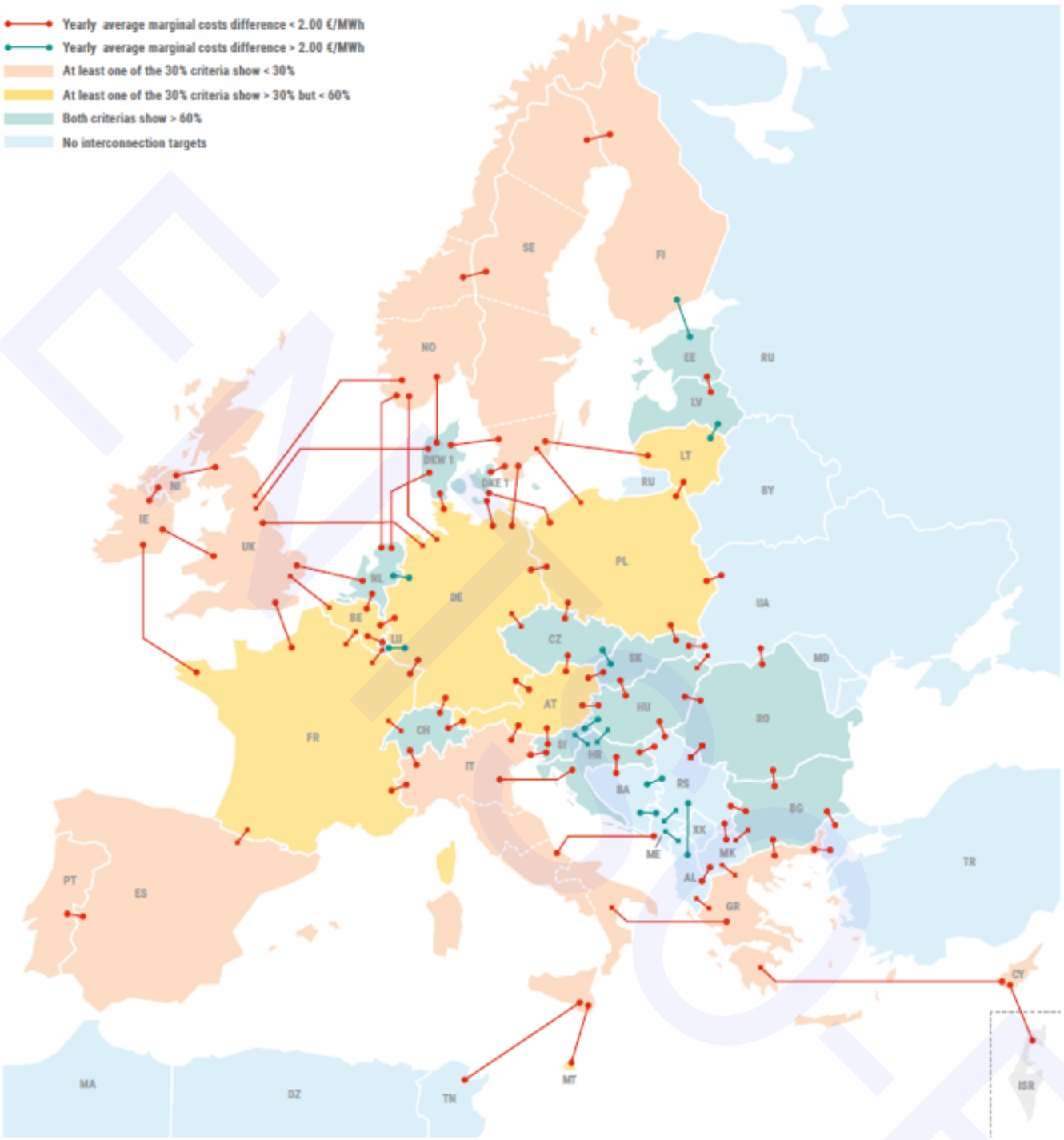
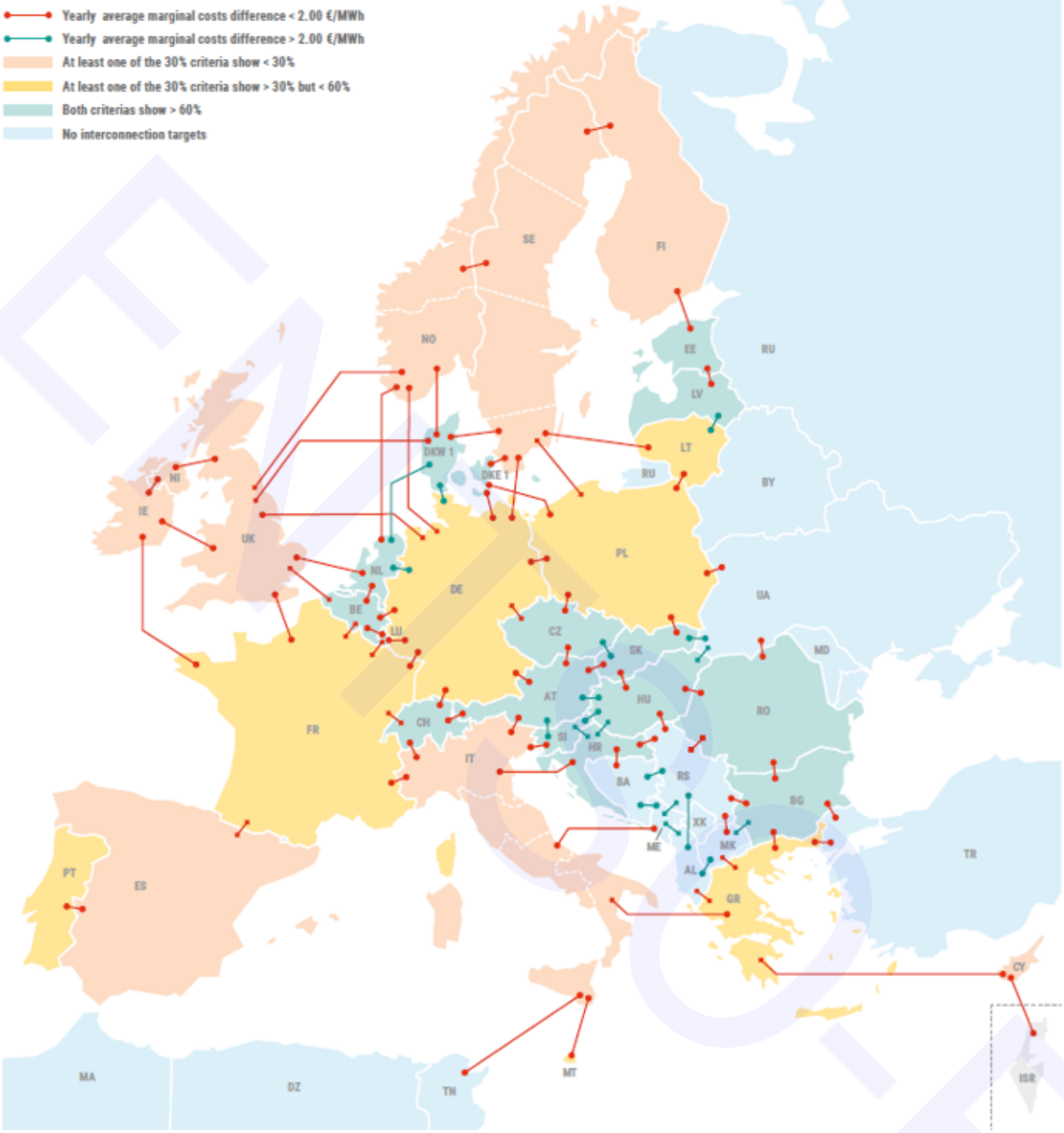

ITEG indicators in 2030 (National Trends), if no grid development is made after 2020
Yearly average marginal costs difference < 2.00 €/MWh
Yearly average marginal costs difference > 2.00 €/MWh
At least one of the 30% criteria show < 30%
At least one of the 30% criteria show > 30% but < 60%
Both criterias show > 60%
No interconnection targets
SE
FI
NO
EE
RU
LV
LT
DKW 1
DKE 1
RU
BY
NI
IE
UK
PL
NL
DE
UA
BE
LU
CZ
SK
MD
AT
HU
RO
FR
CH
SI
HR
IT
BA
RS
BG
XK
ME
MK
AL
TR
PT
ES
GR
CY
MA
DZ
TN
MT
ISR

ITEG indicators in 2030 (Distributed Energy), if no grid development is made after 2020



ITEG indicators in 2030 (Global Ambition), if no grid development is made after 2020



Project Assessment

Transfer capacity increase (National Trends 2025)

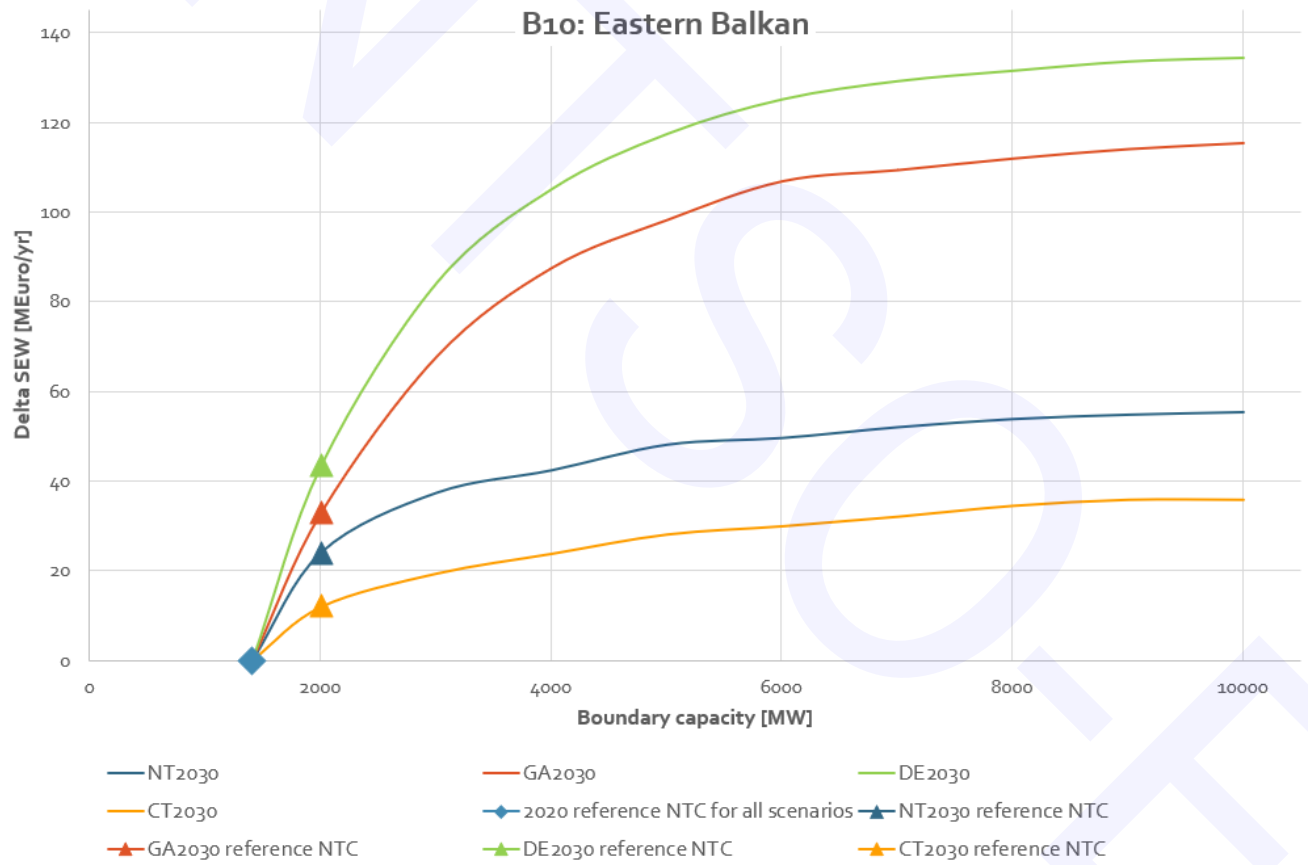
	Border	A B	B A
Transfer capacity increase (in MW)	Romania - Hungary	1117	685

Boundary capacity diagram

Network boundary the projects helps mitigate

Eastern Balkan

Boundary capacity diagram



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	11 8 6	12 8 3	>	>	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	2 -3 -6	-2 -7 -10	>	<	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	max average min	1 0 0	2 1 0	>	>	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	676	62	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-13	-39	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	497	75	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	146	-1779	n/a	n/a	ENTSO-E assessment
B4e Particulate		48	-14	n/a	n/a	ENTSO-E

matter 10	average					assessment
B4f Non-methane volatile organic compounds	average	56	-1808	n/a	n/a	ENTSO-E assessment
B2a Annual CO2 variation from market simulation (ktonnes / year)	max average min	281 115 -101	357 240 87	<	>	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	-4 -9 -19	-8 -17 -39	>> >> >>	< < <<	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)	average	82	145	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	-3 -6 -14	-5 -10 -23	n/a	n/a	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	max average min	19 7 0	41 14 1	>	>	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	159	155	n/a	n/a	ENTSO-E assessment
B5_€ Variation of network losses monetised (M€ / year)	average	8	8	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	21	18	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	0	-27	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting	average	4	4	ENTSO-E assessment

from RES integration			

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)		average	-9	771	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	0 0 1	-19 -50 -119	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	84	95	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	
HU-RO (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	7	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	-1	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	41	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 -3 -7	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	14	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 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
1205. HU-RO	200		0.818
Total	200		0.818

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

1205