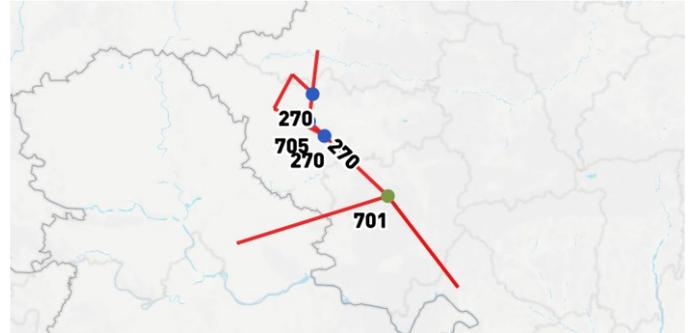


Project 144 - Mid Continental East corridor

The project consists of one double circuit 400 kV line between Serbia and Romania and reinforcement of the network along the western border in Romania: one new simple circuit 400 kV line from Portile de Fier to Resita and upgrade from 220 kV double circuit to 400 kV double circuit of the axis between Resita and Arad, including upgrade to 400 kV of three substations along this path. The project aims at enhancing the transmission capacity along the East-West corridor in south-eastern and central Europe. It will provide access to the market for more than 1000 MW installed new wind generation in Banat area (Serbia and Romania).

Classification	Mid-term Project
Boundary	East-West
PCI label	3.22
Promoted by	TRANSELECTRICA; EMS



Investments								
Investment ID	Description	GTC Contribution	Substation 1	Substation 2	Present Status	Commissioning Date	Evolution since TYNDP 2014	Evolution Driver
238	New 131 km double circuit 400kV OHL between existing substation in Romania and Serbia (63 km on Romanian side and 68 km on Serbian side) 2x1380 MVA.	50%	Resita (RO)	Pancevo (RS)	Under Construction	2017	Investment on time	On Romanian side the line is under construction and the status on Serbian territory is also under construction
269	New 116 km 400kV OHL single circuit between existing substation 400 kV Portile de Fier and new 400 kV substation Resita; 1380 MVA	40%	Portile de Fier (RO)	Resita (RO)	Under Construction	2018	Delayed	The investment was coordinated with investment no 238. The main problems are right of land along the line path and permitting.
270	Upgrading of existing 220kV double circuit corridor Resita - Timisoara - Sacalaz – Arad to 400kV double circuit	25%	Resita (RO)	Arad (RO)	Permitting	2023	Delayed	Planned to start after investment 269 is finalized.
701	New 400 kV substation Resita as development of the existing 220/110 kV substation.	50%	Resita (RO)	Resita (RO)	Permitting	2018	Delayed	This investment is in correlation with investment no 269.
705	Replacement of 220 kV substation Timisoara with 400 kV substation.	25%	Timisoara (RO)	Timisoara (RO)	Design	2023	Delayed	Investments 269 and 701 have to be finalized first.

Additional Information

On the second PCI list are included the following investments:

PCI 3.22.1 Interconnection between Resita (RO) and Pancevo (RS)

PCI 3.22.2 Internal line between Portile de Fier and Resita (RO)

PCI 3.22.3 Internal line between Resita and Timisoara/Sacalaz (RO)

PCI 3.22.4 Internal line between Arad and Timisoara/Sacalaz (RO)

<http://www.transelectrica.ro/web/tel/proiecte-de-interes-comun>

Clustering approach:

Project 144 aims to enhance the transmission capacity along the East-West corridor in the South-Eastern and Central Europe. GTC was calculated for a common boundary in South East region, between the West borders of Romania and Bulgaria which are main exporters of the area on one hand and Serbia and Hungary on the other hand. The investments 238, 269, 270, 701 and 705 are complementing each other as the main enhancements in Romania which remove bottlenecks and integrate RES to the network. Based on upper mentioned information it is crucial to cluster all these investments together, to utilize the possible benefits.

Romanian National development Plan (only in Romanian): <http://www.transelectrica.ro/web/tel/plan-perspectiva>

Investment needs

The project 144 enhances the transmission capacity along the East-West corridor in the South-Eastern and Central Europe. The project 144 supports the large scale integration of new RES in the region of South-west Romania and North-East Serbia.

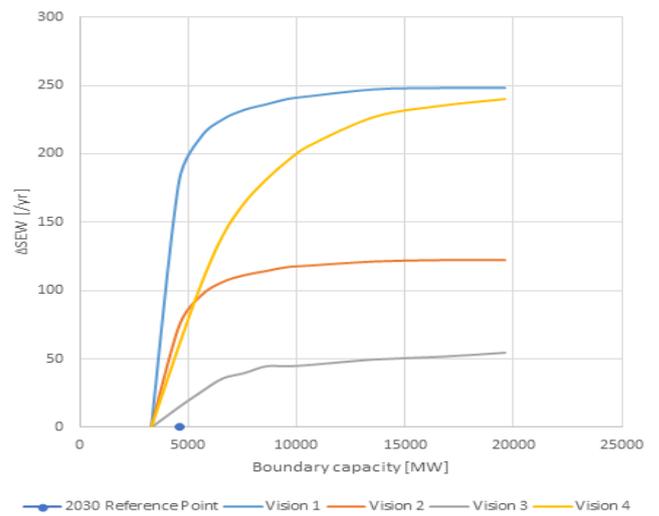
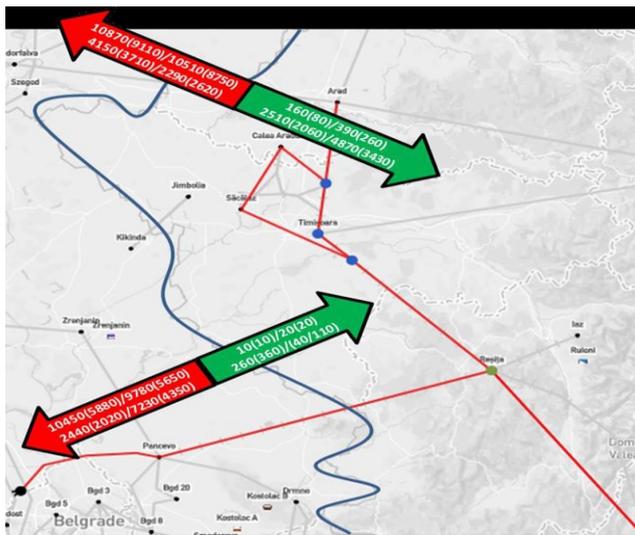
Numbers in the arrows represent annual energy flow [GWh] and refers to each vision 1,2,3,4 respectively. In brackets are given flows when the Project is OUT of operation (TOOT values).

For all For all visions predominant direction of bulk flows is E->W namely Romania – Serbia respectively Romania - Hungary, due to RES integration in Romanian side.

Project will increase transmission capacity in range 960 - 925 MW, or in average for 53% for dominant direction from East (RO) to West (HU+RS+HR+BA+ME). GTC on the boundary considered will reach up to 2585 MW in 2030.

In opposite direction, GTC increase is in range 513 - 750 MW, or in average for 29%. GTC on the boundary considered will reach up to 2855 MW in 2030.

Project 144 supports market integration in mid-term, 2020EP, and brings a benefit to SEW of 50 MEUR. On a long-term, largest benefits on SEW appear in Vision 1, as can be seen in the Figure below that depicts SeW/delta GTC ratios for the 2030 Visions.



Project Cost Benefit Analysis

This project has been assessed by ENTSO-E in line with the Cost Benefit Analysis methodology, approved by the EC in February 2015.

The indicators B6/B7 reflect particular technical system aspects of projects based on a summation of qualitative performance indicators, in line with the CBA methodology; these cannot be used as a proxy for the security of supply indicator.

The assessment of losses variations induced by the projects improved in the TYNDP 2016 compared to the TYNDP 2014 with a comprehensive all year round computations on a wide-area model capturing all relevant flows.

The results must however be considered with caution and not totally reliable due to their very high sensitivity to assumptions regarding the detailed location of generation which are not secured.

General CBA Indicators

Delta GTC contribution (2020) [MW]	HU,RS,HR,BA,ME-RO: 500
	RO-HU,RS,HR,BA,ME: 950
Delta GTC contribution (2030) [MW]	HU,RS,HR,BA,ME-RO: 750
	RO-HU,RS,HR,BA,ME: 950
Capex Costs 2015 (M€) Source: Project Promoter	176 ±25
Cost explanation	Cost represents the currently expected total project investment cost. Uncertainty range related to procurement/construction cost uncertainties
S1	15-50km
S2	Negligible or less than 15km
B6	+
B7	++

Scenario specific CBA indicators	EP2020	Vision 1	Vision 2	Vision 3	Vision 4
B1 SoS (MWh/yr)	N/A	N/A	N/A	N/A	N/A
B2 SEW (MEuros/yr)	50 ±10	90 ±10	60 ±10	<10	60 ±10
B3 RES integration (GWh/yr)	<10	<10	<10	30 ±10	120 ±20
B4 Losses (GWh/yr)	25 ±25	325 ±32	125 ±25	75 ±25	75 ±25
B4 Losses (Meuros/yr)	1 ±1	17 ±2	6 ±1	4 ±2	5 ±2
B5 CO2 Emissions (kT/year)	900 ±50	1700 ±300	1100 ±200	±100	-400 ±100

The project contributes to the reduction of generation cost in Europe that is reflected in SeW values for the examined scenarios. In EP2020, Vision 1 and Vision 2, transfer capacity increase brought by new projects, assists market integration internally in the Region and with the rest of Europe. SeW is created due to the capability to increase the generation of cheap thermal production in the South-Eastern region with an associated increase in CO2 emissions. In Visions 3 and 4, SeW is created mainly because of the increased RES penetration brought by new projects and is accompanied by a corresponding CO2 reduction.