

Before going through the content of each specific Project Fiche, please read the introduction document.

Project Group EAST_03 - Slovakia-Hungary interconnection

Reasons for grouping [ENTSO G]

Project group is composed by projects aiming at expanding in both directions the capacity of the Slovakia-Hungary interconnector at the IP Balassagyarmat/Velké Zlievce as well as the enabler project TRA-A-123 which enables the increase of the capacity and flexibility in both directions (SK-HU/HU-SK).

Objective of the project(s) in the group [Promoter]

The objective of the project group is the utilization maximization of the existing infrastructure in the north-south direction and east-west direction. The IP capacities will be increased and equalized in both directions.



Projects constituting the group

TYNDP Project Code	Project Name	Promoter	Hosting Country	Project Status	4th PCI List Code	First Comm. Year	Last Comm. Year	Compared to TYNP 2018
TRA-A-0123	Városföld CS	FGSZ	HU	Advanced	6.24.4.3	2022	2022	On time
TRA-N-0524	Enhancement of Transmission Capacity of Slovak-Hungarian interconnector	FGSZ	HU	Less-Advanced	6.2.13	2022	2022	-
TRA-N-1235	Firm transmission capacity increase at the IP Velké Zlievce	Eustream,a.s.	SK	Less-Advanced	6.2.13	2022	2022	On time

Technical Information

TYNDP Project Code	Diameter [mm]	Length [km]	Compressor Power [MW]
TRA-A-0123	-	-	6
TRA-N-0524	-	-	16
TRA-N-1235	-	-	10

Capacity Increment

The capacity increment values for each project are provided at all related Interconnection points (IP), both for “exit” and “entry” directions, being indicated the operator of the IP as well as the associated commissioning years of the capacity increments.

This information is presented in the table below and should be read per each line as follows: a certain project, TRA-N-123, can bring at a specific “Point Name” operated by “Operator X” an “exit” capacity increment “From System Y” “To System Z” which has associated an “Increment Commissioning Year”. Equally, for the same “Point Name” and operated by the same “Operator X”, an “entry” (reverse) capacity increment can be available to system “Y” from system “Z” which at its turn has associated an “Increment Commissioning Year”.

TYNDP Project Code	Point Name	Operator	From System	Exit Capacity [GWh/d]	Increment Comm. Year	To System	Entry Capacity [GWh/d]	Increment Comm. Year
TRA-N-1235	Balassagyarmat (HU) / Velké Zlievce (SK)	eustream, a.s.	Transmission Slovakia	25.4	2022	Transmission Hungary (SK-HU Interconnector)	102.2	2022
TRA-N-524	Balassagyarmat (HU) / Velké Zlievce (SK)	FGSZ	Transmission Hungary (MGP)	102	2022	Transmission Slovakia	26	2022

B. Project Cost Information

During the TYNDP 2020 Project Data Collection, promoters were asked to indicate whether their costs were confidential or not. The following tables display the costs provided by the promoters (as of June 2019, end of TYNDP 2020 project collection). The amounts provided can differ from the figures used by the project promoters in other contexts, where costs can be updated and/or evaluated using different methodologies or assumptions. For the purposes of this project fiche, in case promoters identified their costs as confidential, alternative costs have been provided by the promoter. The alternative costs are identified with “*”.

	TRA-A-123	TRA-N-524	TRA-N-1235	Total Cost
CAPEX [min, EUR]	20*	58*	26.18*	104.18
OPEX [min, EUR/y]	3.1*	0.11*	1.95*	5.16
Range CAPEX (%)	25	30	-	-
Range OPEX (%)	15	30	-	-

Description of costs and range [Promoter]

No additional description was provided by the promoter.

C. Project Benefits

C.1 Summary of project benefits

This section provides a summarised analysis by ENTSG of the main benefits stemming from the realisation of the overall group and according to the guidelines included in the ENTSG 2nd CBA Methodology. More details on the indicators are available in sections D and E.

National Trends

Benefits explained (but Sustainability) [ENTSG]

> Security of Supply:

The projects group slightly improves the **Remaining Flexibility** for Hungary in in Peak Day, 2025 (Existing and LOW infrastructure levels) and for Croatia in all climatic cases, 2040 (LOW infrastructure level)

In case of **Ukrainian route disruption**, the projects group slightly mitigates the risk of demand curtailment in Croatia and Hungary, in Existing Infrastructure level, 2025.

> Competition:

The projects group improves the **diversification of entry capacities** (LICD indicator) in Slovakia.

> Market integration:

The project group increases the **bidirectionality** between Slovakia and Hungary.

Distributed Energy

Benefits explained (but Sustainability) [ENTSG]

> Security of Supply:

The projects group slightly improves the **Remaining Flexibility** in Peak Day for Hungary in year 2025 (Existing and LOW infrastructure levels).

In case of **Ukrainian route disruption**, the projects group slightly mitigates the risk of demand curtailment in Croatia and Hungary, in Existing Infrastructure level, 2025.

> Competition:

The projects group improves the **diversification of entry capacities** (LICD indicator) in Slovakia.

> Market integration:

The project group increases the **bidirectionality** between Slovakia and Hungary.

Global Ambition

Benefits explained (but Sustainability) [ENTSOG]

> Security of Supply:

The projects group slightly improves the **Remaining Flexibility** in Peak Day for Hungary in year 2025 (Existing and LOW infrastructure levels).

In case of **Ukrainian route disruption**, the projects group slightly mitigates the risk of demand curtailment in Croatia and Hungary, in Existing Infrastructure level, 2025.

In case of **SLID Slovakia**, the projects group mitigates the risk of demand curtailment in Slovakia, Czech Republic and Austria in Existing Infrastructure level, 2030.

> Competition:

The projects group improves the **diversification of entry capacities** (LICD indicator) in Slovakia.

> Market integration:

The project group increases the **bidirectionality** between Slovakia and Hungary.

Sustainability benefits explained [ENTSOG]

Project groups EAST_03 does not show benefits from fuel switch under flow-based allocation.

Sustainability benefits explained [Project Promoter]

No additional benefits were provided by promoters.

C.2 Quantitative benefits [ENTSOG]

The following tables display all the benefits quantified by ENTSOG through specific indicators and stemming from the realisation of the considered project group. Some of those benefits are measured through quantitative indicators (i.e. SLID and Curtailment rate) and monetised ex-post. Their monetised value is displayed in section E. When assessing those type of benefits, it is important to avoid any double counting considering them both in quantitative and monetised terms.

EXISTING Infrastructure Level – National Trends

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			NT			NT		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		3,905	3,334	-571	3,938	3,338	-599	3,898	3,334	-564	3,847	3,333	-513
Security of Supply													
Remaining Flexibility Peak day (%)													
Hungary		72%	75%	3%	64%	67%	3%						
Ukraine Disruption Curtailment Rate Peak Day (%)													
Croatia					-4%	-2%	2%						
Hungary					-3%	-1%	2%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

LOW Infrastructure Level – National Trends

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			NT			NT		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,805	2,503	-302	2,783	2,500	-282
Security of Supply													
Remaining Flexibility 2-Week Cold Spell (%)													
Croatia											72%	74%	2%
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
Croatia											68%	69%	2%
Remaining Flexibility Peak day (%)													
Croatia											62%	63%	2%
Hungary					96%	99%	3%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

ADVANCED Infrastructure Level – National Trends

Sum of Value		Column Labels											
		2025			2030			2040					
		CBG			GBC			NT					
Row Labels		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,805	2,503	-302	2,783	2,500	-282
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

EXISTING Infrastructure Level – Distributed Energy

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			DE			DE		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		3,905	3,334	-571	3,938	3,338	-599	3,792	3,333	-459	3,762	3,333	-428
Security of Supply													
Remaining Flexibility Peak day (%)													
Hungary		72%	75%	3%	64%	67%	3%						
Ukraine Disruption Curtailment Rate Peak Day (%)													
Croatia					-4%	-2%	2%						
Hungary					-3%	-1%	2%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

LOW Infrastructure Level – Distributed Energy

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			DE			DE		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,756	2,500	-256	2,740	2,500	-240
Security of Supply													
Remaining Flexibility Peak day (%)													
Hungary					96%	99%	3%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

ADVANCED Infrastructure Level – Distributed Energy

Sum of Value		Column Labels											
		2025						2030			2040		
		CBG			GBC			DE			DE		
Row Labels		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,756	2,500	-256	2,740	2,500	-240
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

EXISTING Infrastructure Level – Global Ambition

Sum of Value		Column Labels											
		2025						2030			2040		
		CBG			GBC			GA			GA		
Row Labels		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		3,905	3,334	-571	3,938	3,338	-599	3,825	3,333	-492	3,806	3,333	-473
Security of Supply													
Remaining Flexibility Peak day (%)													
Hungary		72%	75%	3%	64%	67%	3%						
Single Largest Infrastructure Disruption (SLID)-Slovakia													
Austria								24%	19%	-5%			
Czechia								24%	18%	-6%			
Slovakia								24%	18%	-6%			
Ukraine Disruption Curtailment Rate Peak Day (%)													
Croatia					-4%	-2%	2%						
Hungary					-3%	-1%	2%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

LOW Infrastructure Level – Global Ambition

Sum of Value		Column Labels											
		2025			2030			2040					
		CBG			GBC			GA			GA		
Row Labels		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,773	2,500	-273	2,763	2,500	-263
Security of Supply													
Remaining Flexibility Peak day (%)													
Hungary					96%	99%	3%						
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

ADVANCED Infrastructure Level – Global Ambition

Sum of Value		Column Labels											
		2025			2030			2040					
		CBG			GBC			GA			GA		
Row Labels		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
LNG and Interconnection Capacity Diversification (LICD)													
Slovakia		2,809	2,504	-305	2,826	2,509	-318	2,773	2,500	-273	2,763	2,500	-263
Market Integration													
Bi-directionality - Country													
HU <=> SK		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%
Bi-directionality - Point													
Balassagyarmat (HU) / Velké Zlievce (SK)		40%	100%	60%	40%	100%	60%	40%	100%	60%	40%	100%	60%

C.3 Monetised benefits [ENTSOG]

This section includes all benefits stemming from the realisation of a project that are quantified and monetised. Some benefits are monetised ex-post while others directly as a result of the simulations and are impacted by the modelling assumptions chosen (e.g. tariffs or supply price assumptions). Monetised benefits are showed at EU level. In order to keep the results in a manageable number, those have been aggregated per Infrastructure Level and Demand Scenarios. In line with the CBA Methodology, promoters could provide additional benefits related to Sustainability or Gasification. In the tables below these benefits are displayed separately from the ones computed directly by ENTSOG and are labelled as “(Promoter)”. More information on how to read the data in this section is provided in the Introduction Document.

		EXISTING			LOW			ADVANCED		
Benefits (Meur/year)		NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION	NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION	NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION
EU Bill benefits With Tariffs	Reference Supply	0.8	0.7	0.7	0.5	0.5	0.5	0.0	0.0	0.0
	Supply Maximization	1.5	0.9	0.9	0.9	0.7	0.7	0.3	0.3	0.4
Security of Supply	Design Case	0.2	0.2	2.2	0.0	0.0	1.2	0.0	0.0	0.0
	2-weeks Cold Spell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustainability	CO2 and Other externalities savings	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	Additional benefit (Promoter)	0	0	0	0	0	0	0	0	0

Comparison between the assessed SCENARIOS

ENTSOG runs the assessment for 5-year-rounded years (2020, 2025, 2030 and 2040) and interpolates these results to compute the benefits for the 25-years economic lifetime of projects. The following tables show the benefits as computed in the specific assessment years.

Year of assessment		2020									2025								
		EXISTING			LOW			ADVANCED			EXISTING			LOW			ADVANCED		
Benefits (Meur/year)		NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA
EU Bill benefits With Tariffs	Reference Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	3.0	2.3	2.3	2.3	0.0	0.0	0.0
	Supply Maximization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	3.9	3.9	2.8	2.8	2.8	1.1	1.1	1.1
Security of Supply	Design Case	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	6.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustainability	CO2 and Other externalities savings	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	Additional benefit (Promoter)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Year of assessment		2030									2040								
		EXISTING			LOW			ADVANCED			EXISTING			LOW			ADVANCED		
Benefits (Meur/year)		NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA	NT	DE	GA
EU Bill benefits With Tariffs	Reference Supply	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Supply Maximization	2.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Security of Supply	Design Case	0.0	0.0	6.1	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustainability	CO2 and Other externalities savings	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	Additional benefit (Promoter)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C.4 Sensitivities analysis on monetised benefits [ENTSOG]

In line with ENTSG Adapted 2nd CBA Methodology, ENTSG has also run sensitivities on some relevant assumptions such as tariffs, commissioning year and lower supply source price differential. The results included in the tables below have to be compared with the ones included in section C.3. Further information is available in the common introduction (Pages 1-6) to all project fiches. Independently from the source of the input as described in C3 (ENTSG or Promoter), the sensitivity analysis has been carried out by ENTSG and according to the criteria in the approved CBA Methodology.

[illegible]

D. Environmental Impact [Promoter]

Any gas infrastructure has an impact on its surroundings. This impact is of particular relevance when crossing some environmentally sensitive areas. Mitigation measures are taken by the promoters to reduce this impact and comply with the EU and National regulations. The Tables have been filled in by the promoter.

TYNDP Code	Type of infrastructure	Surface of impact	Environmentally sensitive area

Potential impact	Mitigation measures	Related costs included in project CAPEX and OPEX	Additional expected costs

Environmental Impact explained [Promoter]

Environmental impact assessments for the projects have not indicated any substantial and irreversible impacts on the environment. In order to ensure that environmental assessments are correct, environmental monitoring is carried out before, during and after the construction of the infrastructure.

E. Other Benefits [Promoter]

Missing benefits are all benefits of a project which may be not captured by the current application in TYNDP 2020 of the 2nd CBA Methodology.

As a necessary condition a missing benefit cannot have discrepancies with the benefits already covered by the assessment run by ENTSOG and this condition needs to be proved and justified.

Other benefits explained

Investment into the existing transmission corridor avoids stranded investments into new transmission corridor and optimize overall cost of capacity utilization.

F. Useful Links

Network Development Plan:

SK:

https://www.eustream.sk/files/docs/sk/Plan_rozvoja_prepravnej_siete_na_obdobie_2020_2029.pdf

HU:

https://fgsz.hu/file/documents/1/1743/2020_07_09_ten_year_network_development_plan.pdf