

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

Project Group EAST_16B - South Bosnia-Croatia interconnection + IAP

Reasons for grouping [ENTSO G]

The project group is composed by:

- > Interconnection between Bosnia and Herzegovina and Croatia at IP Posušje and includes the two sides of the investment.
- > Ionic-Adriatic Pipeline which connects with the Croatian transmission network, as well as, with the Trans Adriatic pipeline.

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

Group will integrate BiH with the Croatian gas transmission system and enable BiH to supply gas from other markets (LNG Krk, European and Caspian and Middle East sources from TAP and IAP). Having a single point of entry of gas supplies poses a significant risk of disruption of gas supply to BiH; therefore the need for an alternative supply route and source is evident. Additionally, capacity of the existing transmission system is not enough both to meet BiH current demand during winter season and for the planned market enhancement.

Group will additionally enable gas market development in southern Croatia and BiH where natural gas is unavailable.

The Ionic-Adriatic Pipeline will have an influence on the gasification for the entire region. The IAP project is based on the idea of connecting the existing Croatian gas transmission system, via Montenegro and Albania, with the TAP gas pipeline system (Trans Adriatic Pipeline). An exit to Bosnia and Herzegovina is planned via Southern interconnection between Bosnia and Herzegovina and Croatia. The implementation of the entire IAP project provides opening of the new energy corridor for the region of CEE and SEE within the Southern Gas Corridor – SGC), for the purpose of establishing a new natural gas supply route from the Middle East and Caspian region.

IAP will have a potential to provide bi-directional gas flow. This fact gives the LNG project on the island of Krk a significant importance since it could be a source of gas for IAP, which means that IAP is fully compatible with the LNG project on the island of Krk.



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 TYNDP 2018
TRA-A-0068	Ionian Adriatic Pipeline	Plinacro Ltd	HR	Advanced	-	2023	2025	Rescheduled
TRA-N-0851	Southern Interconnection pipeline BiH/CRO	BH Gas d.o.o.	BA	Less-Advanced	-	2023	2023	Rescheduled
TRA-A-0302	Interconnection Croatia-Bosnia and Herzegovina (South)	Plinacro Ltd	HR	Advanced	-	2023	2023	Rescheduled

Projects Overview

Technical Information – Pipeline/UGS/LNG

TYNDP Project Code	Diameter [mm]	Length [km]	Compressor Power [MW]
TRA-A-0068	800	180	-
TRA-A-0068	800	110	-
TRA-A-0068	800	250	1,4
TRA-A-0302	500	22	-
TRA-N-0851	500	162	-

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-A-302	Posušje	Plinacro Ltd	Transmission Ionic-Adriatic Pipeline Croatia	81	2023	Transmission Bosnia Herzegovina	81	2023
TRA-A-68	Ionic-Adriatic Pipeline - IAP / AB	Plinacro Ltd	Transmission Ionic-Adriatic Pipeline Croatia	33.3	2025	Transmission Albania	0	-
TRA-A-68	Ionic-Adriatic Pipeline - IAP / ME	Plinacro Ltd	Transmission Ionic-Adriatic Pipeline Croatia	16.6	2025	Transmission Montenegro	0	-
TRA-A-68	Ionic-Adriatic Pipeline - IAP / Split - HR	Plinacro Ltd	Transmission Croatia	116.6	2025	Transmission Ionic-Adriatic Pipeline Croatia	0	-
TRA-A-68	Ionic-Adriatic Pipeline - IAP / Split - HR	Plinacro Ltd	Transmission Croatia	0	-	Transmission Ionic-Adriatic Pipeline Croatia	83.2	2023
TRA-A-68	Ionic-Adriatic Pipeline - IAP Entry	Plinacro Ltd	Transmission Ionic-Adriatic Pipeline Croatia (TAP-IAP Interconnection)	0	-	Transmission Ionic-Adriatic Pipeline Croatia	166.5	2025

TRA-A-68	Trans-Adriatic Pipeline (TAP) / Ionic-Adriatic Pipeline (IAP)	Plinacro Ltd	Transmission Trans-Adriatic Pipeline Albania	0	-	Transmission Ionic-Adriatic Pipeline Croatia (TAP-IAP Interconnection)	166.5	2025
TRA-N-851	Posušje	BH Gas d.o.o.	Transmission Bosnia Herzegovina	38	2023	Transmission Ionic-Adriatic Pipeline Croatia	73	2023

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-0068	TRA-A-0302	TRA-N-0851	Total Cost
CAPEX [mln. EUR]	576*	16.12*	101	707,12
Range CAPEX	0	0	5	
OPEX [mln. EUR/y]	10.37*	0.29*	1	12,29
Range OPEX	0	0	1	

Description of costs and range [Promoter]

- TRA-N-0302 Interconnection Croatia-Bosnia and Herzegovina (South)

Description of CAPEX: 100% of the CAPEX of the Interconnection Croatia-Bosnia and Herzegovina (South) refers to the costs of designing and engineering, civil works, assembly and installation works, material and equipment.

Description of OPEX: 100% of the cost refers to the operation and maintenance cost. There are no additional costs of own consumption (fuel gas) and labour cost.

CAPEX and OPEX represent best estimations available to project promoters at the moment of TYNDP 2020 call for projects (start of 2020).

- TRA-N-0851 Southern Interconnection pipeline BiH/CRO

Estimated CAPEX includes investments in the construction of the pipeline (114 km of the main route and 48 km of branch to Mostar) and aboveground facilities, land acquisition, project documentation and permits. Data source: PFS 2013, CBA 2018. CAPEX range is estimated as 5% because of the age and maturity of available data. Once when FS and Preliminary Design will be developed, CAPEX data will be more accurate.

- TRA-A-0068 Ionian-Adriatic Pipeliene

Estimated CAPEX includes investments in the construction of the pipeline and the compression station in Split. Description of CAPEX: 100% of the CAPEX of the Ionian-Adriatic Pipeline refers to the costs of designing and engineering, civil works, assembly and installation works, material and equipment.

Description of OPEX: 100% of the cost refers to the operation and maintenance cost. There are no additional costs of own consumption (fuel gas) and labour cost.

CAPEX and OPEX represent best estimations available to project promoters at the moment of TYNDP 2020 call for projects (start of 2020).

C. Project Benefits

C.1 Summary of project benefits

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

National Trends

Benefits explained (but Sustainability) [ENTSOG]

> Security of Supply:

In the existing infrastructure level, the project group **fully mitigates the risk of demand curtailment** under 2-weeks cold spell and 2-weeks dunkelflaute in Bosnia and Herzegovina from 2030 and also provides **additional remaining flexibility** to the Bosnian gas network to face these climatic stress events. Additionally, it also **reduces the risk of demand curtailment** from 2030 under peak day climatic stress conditions in Bosnia Herzegovina and in Serbia for all climatic cases from.

In the low and advanced infrastructure levels, the project group together with FID and advanced projects **fully mitigates the risk of demand curtailment** in Bosnia and Herzegovina from 2030 for peak-day climatic stress conditions **and increases remaining flexibility** from 2025 in Croatia and in Bosnia Herzegovina (from 2030 peak-day and in 2040)

For **Single Largest Infrastructure Disruption in Bosnia and Herzegovina** (SLID-BA indicator) in the existing infrastructure level, with the project group the largest infrastructure will change to the new interconnection with Croatia at Posušje IP (instead of the interconnection with Serbia at Zvornik IP). By having an additional entry to the gas system, in case of disruption, Bosnia could also flow gas through Serbia and therefore **reduces the risk of demand curtailment** in Bosnia from 2025. Additionally, for this same indicator SLID-BA, in the low and advanced infrastructure levels, the project group **fully mitigates the risk of demand curtailment** in Bosnia in 2025. However, from 2030, due to the gas demand increase in Bosnia and Herzegovina, the project group **partially mitigates the risk of demand curtailment**.

Regarding the **disruption of the single largest infrastructure of Croatia** (SLID-HR indicator) in the existing infrastructure level, the project group, thanks to the Ionian Adriatic Pipeline, **fully mitigates the risk of demand curtailment** in Croatia in 2025 (CBG) and significantly reduces the risk of disruption in **Croatia, Bosnia Herzegovina and Serbia** from 2030.

Regarding the **disruption of the single largest infrastructure of Serbia** (SLID-RS indicator) in the existing and low infrastructure level which is the interconnection Serbia-Hungary at Kiskundorozsma IP, the project group **significantly reduces the risk of demand curtailment** in Bosnia. In addition, for this same indicator (SLID-RS), in the low infrastructure level, the project group together with FID projects also **reduces the risk of demand curtailment** in Serbia from 2030.

> Market integration:

The project group brings benefits in monetised term as a **reduction of the cost of gas supply**. In the existing infrastructure level, this can be estimated around 0.43 MEur/y (on average) for the reference supply price configuration (similar benefits to reference under expensive Russian gas or cheap LNG configurations). Such benefit is explained by the savings in the cost of gas supply in Bosnia linked to the access savings in transportations cost thanks to the new from Croatia.

Additional benefits compared to the existing infrastructure can be observed in case of low and advanced infrastructure levels, not only for reference supply price configuration, but also in case of expensive Russian gas or cheap LNG (up to 3 MEUR/y in the advanced infrastructure level). Such benefits are mainly explained by tariffs savings by the utilisation of this new supply route that allows Bosnia for a more direct gas access through Croatia thanks to the FID and advanced-status projects commissioned in Croatia allowing Bosnia to access LNG.

Distributed Energy

Benefits explained (but Sustainability) [ENTSOG]

> Security of Supply:

In the existing infrastructure level, the project group **fully mitigates the risk of demand curtailment** under all climatic stress cases in Bosnia and Herzegovina from 2030 and it also **reduces the risk of demand curtailment** in Serbia from 2030 all climatic cases from. Additionally, it provides **additional remaining flexibility** to the Bosnian gas network to face these climatic stress events.

In the low and advanced infrastructure levels, the project group together with FID and advanced projects **fully mitigates the risk of demand curtailment** in Bosnia and Herzegovina from 2030 for peak-day climatic stress conditions **and increases remaining flexibility** only in 2025 in Croatia and from 2030 for peak-day and in 2040 for all climatic stress cases in Bosnia Herzegovina.

For **Single Largest Infrastructure Disruption in Bosnia and Herzegovina** (SLID-BA indicator) in the existing infrastructure level, with the project group the largest infrastructure will change to the new interconnection with Croatia at Posušje IP (instead of the interconnection with Serbia at Zvornik IP). By having an additional entry to the gas system, in case of disruption, Bosnia could also flow gas through Serbia and therefore **reduces the risk of demand curtailment** in Bosnia from 2025. Additionally, for this same indicator SLID-BA, in the low and advanced infrastructure levels, the project group **fully mitigates the risk of demand curtailment** in Bosnia in 2025. However, from 2030, due to the gas demand increase in Bosnia and Herzegovina and Serbia, the project group **partially mitigates the risk of demand curtailment**.

Regarding the **disruption of the single largest infrastructure of Croatia** (SLID-HR indicator) in the existing infrastructure level, the project group, thanks to the Ionian Adriatic Pipeline, **fully mitigates the risk of demand curtailment** in Croatia in 2025 and 2030 and in Bosnia from 2030 and it also reduces the risk of disruption in Serbia from 2030.

Regarding the **disruption of the single largest infrastructure of Serbia** (SLID-RS indicator) in the existing infrastructure level which is the interconnection Serbia-Hungary at Kiskundorozsma IP, the project group **significantly reduces the risk of demand curtailment** in Bosnia. In addition, for this same indicator (SLID-RS), in the low infrastructure level, the project group together with FID projects also **reduces the risk of demand curtailment** in Serbia from 2030.

> Market integration:

The project group brings benefits in monetised term as a **reduction of the cost of gas supply**. In the existing infrastructure level, this can be estimated around 1.2 MEur/y (on average) for the reference supply price configuration (similar benefits to reference under expensive Russian gas or cheap LNG configurations). Such benefit is explained by the savings in the cost of gas supply in Bosnia linked to the access savings in transportations cost thanks to the new from Croatia.

Additional benefits compared to the existing infrastructure can be observed in case of low and advanced infrastructure levels, not only for reference supply price configuration, but also in case of expensive Russian gas or cheap LNG (up to 4.7 MEUR/y in the low infrastructure level). Such benefits are mainly explained by tariffs savings by the utilisation of this new supply route that allows Bosnia for a more direct gas access through Croatia thanks to the FID and advanced-status projects commissioned in Croatia allowing Bosnia to access LNG.

Benefits from supply cost savings for Distributed Energy demand scenario are higher than National Trends, mainly due to the lower demand in Croatia in DE scenario, which allows to flow more gas through the new interconnection in this scenario.

Global Ambition

Benefits explained (but Sustainability) [ENTSOG]

> Security of Supply:

In the existing infrastructure level, the project group **fully mitigates the risk of demand curtailment** under all climatic stress cases in Bosnia and Herzegovina from 2030 and it also **reduces the risk of demand curtailment** in Serbia from 2030 all climatic cases from. Additionally, it provides **additional remaining flexibility** to the Bosnian gas network to face these climatic stress events.

In the low and advanced infrastructure levels, the project group together with FID and advanced projects **fully mitigates the risk of demand curtailment** in Bosnia and Herzegovina from 2030 for peak-day climatic stress conditions **and increases remaining flexibility** only in 2025 in Croatia and from 2030 for peak-day and in 2040 for all climatic stress cases in Bosnia Herzegovina.

For **Single Largest Infrastructure Disruption in Bosnia and Herzegovina** (SLID-BA indicator) in the existing infrastructure level, with the project group the largest infrastructure will change to the new interconnection with Croatia at Posušje IP (instead of the interconnection with Serbia at Zvornik IP). By having an additional entry to the gas system, in case of disruption, Bosnia could also flow gas through Serbia and therefore **reduces the risk of demand curtailment** in Bosnia from 2025. Additionally, for this same indicator SLID-BA, in the low and advanced infrastructure levels, the project group **fully mitigates the risk of demand curtailment** in Bosnia in 2025. However, from 2030, due to the gas demand increase in Bosnia and Herzegovina and Serbia, the project group **partially mitigates the risk of demand curtailment**.

Regarding the **disruption of the single largest infrastructure of Croatia** (SLID-HR indicator) in the existing infrastructure level, the project group, thanks to the Ionian Adriatic Pipeline, **fully mitigates the risk of demand curtailment** in Croatia in 2025 and 2030 and in Bosnia from 2030 and it also reduces the risk of disruption in Serbia from 2030.

Regarding the **disruption of the single largest infrastructure of Serbia** (SLID-RS indicator) in the existing infrastructure level which is the interconnection Serbia-Hungary at Kiskundorozsma IP, the project group **significantly reduces the risk of demand curtailment** in Bosnia. In addition, for this same indicator (SLID-RS), in the low infrastructure level, the project group together with FID projects also **reduces the risk of demand curtailment** in Serbia from 2030.

> Competition:

The project group **reduces dependence of Russian gas** in the low infrastructure level in Croatia and Slovenia in 2030 and 2040. In the advanced infrastructure level, all European countries show low dependency to Russian gas for Global Ambition demand scenario.

> Market integration:

The project group brings benefits in monetised term as a **reduction of the cost of gas supply**. In the existing infrastructure level, this can be estimated around 0.5 MEur/y (on average) for the reference supply price configuration (similar benefits to reference under expensive Russian gas or cheap LNG configurations). Such benefit is explained by the savings in the cost of gas supply in Bosnia linked to the access savings in transportations cost thanks to the new from Croatia.

Additional benefits compared to the existing infrastructure can be observed in case of low and advanced infrastructure levels, not only for reference supply price configuration, but also in case of expensive Russian gas or cheap LNG (up to 3.7 MEUR/y in the low infrastructure level). Such benefits are mainly explained by tariffs savings by the utilisation of this new supply route that allows Bosnia for a more direct gas access through Croatia thanks to the FID and advanced-status projects commissioned in Croatia allowing Bosnia to access LNG.

Sustainability benefits explained [ENTSOG]

ENTSOG analysis shows that project group EAST_16B does not show significant benefits from fuel switch under flow-based allocation.

Sustainability benefits explained [Promoter]

In addition to ENTSOG's analysis on Sustainability, the promoter complements this analysis with the following country-specific information:

The realization of the project will, in addition to the introduction of natural gas as a completely new energy source in Montenegro, enable further development of the natural gas market in Albania, gasification of southern part of Croatia, as well as southern and central parts of Bosnia and Herzegovina. In addition to the above, the project will enable the diversification of natural gas supply sources for countries that already use natural gas, and for Bosnia and Herzegovina it will additionally affect the security of supply of the existing natural gas market (currently N-1=0 in BiH) and will enable the further development of natural gas market in Bosnia and Herzegovina, which is of the crucial importance for cities in BiH because of extremely high air pollution caused by using of coal and heavy fuel in industry and commercial and residential sectors.

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		
	CBG			GBC			NT			NT		
Row Labels	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Security of Supply												
Curtailed Rate 2-Week Cold Spell (%)												
Bosnia Herzegovina							-18%	0%	18%	-14%	0%	14%
Serbia							-18%	-14%	4%	-13%	-8%	5%
Curtailed Rate 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							-18%	0%	18%	-14%	0%	14%
Serbia							-18%	-14%	4%	-13%	-8%	6%
Curtailed Rate Peak Day (%)												
Bosnia Herzegovina							-36%	-4%	32%	-41%	-4%	37%
Serbia							-34%	-27%	7%	-36%	-28%	8%
Remaining Flexibility 2-Week Cold Spell (%)												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
Remaining Flexibility 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina												
Bosnia Herzegovina	100%	18%	-82%	100%	18%	-82%	100%	36%	-64%	100%	41%	-59%
Single Largest Infrastructure Disruption (SLID)-Bulgaria												
Bosnia Herzegovina							27%	0%	-27%	41%	0%	-41%
Serbia							35%	31%	-4%	36%	31%	-5%
Single Largest Infrastructure Disruption (SLID)-Croatia												
Bosnia Herzegovina							36%	4%	-32%	41%	4%	-37%
Croatia	35%	0%	-35%	37%	1%	-36%	35%	4%	-31%	35%	4%	-31%
Serbia							34%	27%	-7%	36%	28%	-8%
Single Largest Infrastructure Disruption (SLID)-Serbia												
Bosnia Herzegovina							90%	4%	-86%	90%	4%	-86%

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
Security of Supply													
Curtailement Rate Peak Day (%)													
Bosnia Herzegovina								-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
Bosnia Herzegovina											54%	100%	46%
Croatia		53%	59%	6%	46%	52%	6%	73%	80%	6%	72%	76%	4%
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
Bosnia Herzegovina											47%	100%	53%
Croatia		49%	55%	6%	43%	49%	5%	63%	69%	6%	68%	71%	4%
Remaining Flexibility Peak day (%)													
Bosnia Herzegovina								0%	100%	100%	0%	100%	100%
Croatia		42%	46%	4%	37%	41%	4%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
Bosnia Herzegovina		100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%
Single Largest Infrastructure Disruption (SLID)-Serbia													
Bosnia Herzegovina								28%	0%	-28%	41%	0%	-41%

ADVANCED 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
Security of Supply													
Curtailement Rate Peak Day (%)													
Bosnia Herzegovina								-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
Bosnia Herzegovina											54%	100%	46%
Croatia		84%	90%	6%	76%	82%	6%						
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
Bosnia Herzegovina											47%	100%	53%
Croatia		79%	86%	6%	72%	78%	6%	96%	100%	4%			
Remaining Flexibility Peak day (%)													
Bosnia Herzegovina								0%	100%	100%	0%	100%	100%
Croatia		70%	75%	4%	64%	68%	4%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
Bosnia Herzegovina		100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%

EXISTING 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
Security of Supply												
▾ Curtailment Rate 2-Week Cold Spell (%)												
Bosnia Herzegovina							-18%	0%	18%	-20%	0%	20%
Serbia							-17%	-13%	4%	-19%	-15%	5%
▾ Curtailment Rate 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							-18%	0%	18%	-20%	0%	20%
Serbia							-17%	-13%	4%	-19%	-15%	5%
▾ Curtailment Rate Peak Day (%)												
Bosnia Herzegovina							-36%	0%	36%	-41%	0%	41%
Serbia							-34%	-27%	7%	-36%	-28%	8%
▾ Remaining Flexibility 2-Week Cold Spell (%)												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▾ Remaining Flexibility 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▾ Remaining Flexibility Peak day (%)												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▾ Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina												
Bosnia Herzegovina	100%	18%	-82%	100%	18%	-82%	100%	36%	-64%	100%	41%	-59%
▾ Single Largest Infrastructure Disruption (SLID)-Croatia												
Bosnia Herzegovina							36%	0%	-36%	41%	0%	-41%
Croatia	35%	0%	-35%	37%	1%	-36%	8%	0%	-8%	36%	28%	-8%
Serbia							34%	27%	-7%	36%	28%	-8%
▾ Single Largest Infrastructure Disruption (SLID)-Serbia												
Bosnia Herzegovina							90%	0%	-90%	90%	0%	-90%

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
Security of Supply													
Curtailment Rate Peak Day (%)													
	Bosnia Herzegovina							-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
	Bosnia Herzegovina										54%	100%	46%
	Croatia	53%	59%	6%	46%	52%	6%						
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
	Bosnia Herzegovina										47%	100%	53%
	Croatia	49%	55%	6%	43%	49%	5%						
Remaining Flexibility Peak day (%)													
	Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
	Croatia	42%	46%	4%	37%	41%	4%						
	Hungary				96%	97%	1%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
	Bosnia Herzegovina	100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%
Single Largest Infrastructure Disruption (SLID)-Serbia													
	Bosnia Herzegovina							28%	0%	-28%	41%	0%	-41%
	Serbia							27%	19%	-7%	28%	20%	-8%

ADVANCED 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
Security of Supply													
Curtailment Rate Peak Day (%)													
	Bosnia Herzegovina							-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
	Bosnia Herzegovina										54%	100%	46%
	Croatia	84%	90%	6%	76%	82%	6%						
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
	Bosnia Herzegovina										47%	100%	53%
	Croatia	79%	86%	6%	72%	78%	6%						
Remaining Flexibility Peak day (%)													
	Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
	Croatia	70%	75%	4%	64%	68%	4%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
	Bosnia Herzegovina	100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%

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
Security of Supply												
▢ Curtailment Rate 2-Week Cold Spell (%)												
Bosnia Herzegovina							-24%	0%	24%	-26%	0%	26%
Serbia							-23%	-19%	3%	-25%	-21%	4%
▢ Curtailment Rate 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							-24%	0%	24%	-26%	0%	26%
Serbia							-23%	-19%	3%	-25%	-21%	4%
▢ Curtailment Rate Peak Day (%)												
Bosnia Herzegovina							-36%	0%	36%	-41%	0%	41%
Serbia							-34%	-27%	7%	-36%	-28%	8%
▢ Remaining Flexibility 2-Week Cold Spell (%)												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▢ Remaining Flexibility 2-Week Cold Spell (%) --- DF												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▢ Remaining Flexibility Peak day (%)												
Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
▢ Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina												
Bosnia Herzegovina	100%	18%	-82%	100%	18%	-82%	100%	36%	-64%	100%	41%	-59%
▢ Single Largest Infrastructure Disruption (SLID)-Croatia												
Bosnia Herzegovina							36%	0%	-36%	41%	0%	-41%
Croatia	35%	0%	-35%	37%	1%	-36%	16%	0%	-16%	7%	0%	-7%
Serbia							34%	27%	-7%	36%	28%	-8%
▢ Single Largest Infrastructure Disruption (SLID)-Serbia												
Bosnia Herzegovina							90%	0%	-90%	90%	0%	-90%

LOW Infrastructure Level – Global Ambition

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			GA			GA		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Competition													
MASD-RU													
	Croatia							30%	27%	-3%	23%	13%	-10%
	Slovenia				33%	30%	-3%				23%	17%	-6%
Security of Supply													
Curtailment Rate Peak Day (%)													
	Bosnia Herzegovina							-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
	Bosnia Herzegovina										54%	100%	46%
	Croatia	53%	59%	6%	46%	52%	6%						
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
	Bosnia Herzegovina										47%	100%	53%
	Croatia	49%	55%	6%	43%	49%	5%						
Remaining Flexibility Peak day (%)													
	Belgium							53%	55%	1%			
	Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
	Croatia	42%	46%	4%	37%	41%	4%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
	Bosnia Herzegovina	100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%
Single Largest Infrastructure Disruption (SLID)-Serbia													
	Bosnia Herzegovina							28%	0%	-28%	41%	0%	-41%
	Serbia							27%	19%	-7%	28%	20%	-8%

ADVANCED Infrastructure Level – Global Ambition

Sum of Value		Column Labels											
		2025			2030			2040					
Row Labels		CBG			GBC			GA			GA		
		WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA	WITHOUT	WITH	DELTA
Security of Supply													
Curtailment Rate Peak Day (%)													
	Bosnia Herzegovina							-27%	0%	27%	-41%	0%	41%
Remaining Flexibility 2-Week Cold Spell (%)													
	Bosnia Herzegovina										54%	100%	46%
	Croatia	84%	90%	6%	76%	82%	6%						
Remaining Flexibility 2-Week Cold Spell (%) --- DF													
	Bosnia Herzegovina										47%	100%	53%
	Croatia	79%	86%	6%	72%	78%	6%						
Remaining Flexibility Peak day (%)													
	Bosnia Herzegovina							0%	100%	100%	0%	100%	100%
	Croatia	70%	75%	4%	64%	68%	4%						
Single Largest Infrastructure Disruption (SLID)-Bosnia Herzegovina													
	Bosnia Herzegovina	100%	0%	-100%	100%	0%	-100%	100%	27%	-73%	100%	41%	-59%

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.

Benefits (Meur/year)		EXISTING			LOW			ADVANCED		
		NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION	NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION	NATIONAL TRENDS	DISTRIBUTED ENERGY	GLOBAL AMBITION
EU Bill benefits	Reference Supply	0.4	1.2	0.5	1.5	3.7	3.6	2.8	4.2	3.9
With Tariffs	Supply Maximization	0.4	1.3	0.6	2.0	4.7	3.7	2.9	4.3	3.9
Security of Supply	Design Case	2.9	2.0	2.2	1.0	1.0	1.0	0.8	0.8	0.8
	2-weeks Cold Spell	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell DF	4.0	4.0	4.0	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	0.0	0.0	67.1	67.1	67.1
Gasification Benefits	Fuel Switch	0.0	0.0	0.0	0.0	0.0	0.0	51.0	51.0	51.0

Comparison between the assessed SCENARIOS

ENTSOE 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	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3	0.3	0.3	0.3	0.3	0.3	0.3
	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
Gasification Benefits	Fuel Switch	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	0.4	0.4	0.4	2.8	3.5	3.4	3.6	3.7	3.7	0.5	2.1	0.6	1.3	5.4	5.1	2.9	5.6	5.0
	Supply Maximization	0.4	0.4	0.4	3.2	4.7	4.0	3.6	3.7	3.7	0.6	2.3	0.9	2.0	6.6	5.1	3.1	5.8	5.0
Security of Supply	Design Case	2.9	1.8	2.2	1.1	0.9	0.9	0.7	0.7	0.7	3.1	10.0	2.1	1.3	1.7	1.3	0.9	8.0	8.0
	2-weeks Cold Spell	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	4.9	4.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0
	2-weeks Cold Spell DF	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.1	5.1	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	30.0	30.0	30.0	0.00	0.00	0.00	0.0	0.0	0.0	133.0	133.0	133.0
Gasification Benefits	Fuel Switch	0.0	0.0	0.0	0.0	0.0	0.0	27.0	27.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	98.0	98.0	98.0

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
TRA-N-0068	Transmission gas pipeline + CS	DN 800, length 540 km	NO
TRA-N-0302	Transmission gas pipeline	DN 500, length 22 km	NO
TRA-N-851	Transmission gas pipeline	The South Interconnection of BiH and Croatia project is located mainly on the territory of BiH in the length of 162 km. The project falls within the administrative boundaries of the following cantons: Herzegovina-Neretva, West Herzegovina, Canton 10 and Central Bosnia Canton.	Potential sensitive area will be identified during ESIA/EIA procedure and development of Preliminary Design (currently in progress)

Potential impact	Mitigation measures	Related costs included in project CAPEX and OPEX	Additional expected costs
During construction period the potential impacts on the environment are likely to appear in the following areas: air quality, noise, geomorphology, habitats, cultural heritage.	<p>For the project TRA-N-0302, EIA procedure has been carried out and a Decision on acceptability has been issued by the Croatian line Ministry. The Decision on acceptability issued by the Ministry includes prescribed relevant environmental protection measures for reducing the potential impacts to the lowest level. EIA procedures were carried out in accordance with the Croatian national legislation, that is, they have been aligned with the EU requirements.</p> <p>For the project TRA-N-0851 the mitigation measures will be identified through ESIA/EIA Study that is currently in progress and that carried out in accordance with EBRD requirements as well as national legislation.</p>	Included in project	

<p>TRA-N-0068</p> <p>During construction period the potential impacts on the environment are likely for: air quality, noise, geomorphology, habitats, cultural heritage</p>	<p>For Croatian part of the route TRA-N-0068 EIA procedures have been carried out and Decisions on acceptability have been issued by the Croatian line Ministry. The Ministry' Decision on acceptability includes prescribed relevant environmental protection measures for reducing the potential impacts to the lowest level. EIA procedures were carried out in accordance with Croatian national legislation that is aligned with EU requirements.</p> <p>For the pipeline sections in Albania and Montenegro appropriate assessments (EIA) have also been carried out within Feasibility study.</p>	<p>Included in project CAPEX</p>	
<p>Major potentially environmental impact of the project occurs during the construction period (disturbance, impacts due to the dust, noise from transport and machineries). Impacts on the environment to be considered during EIA procedure are for: air quality, noise, geomorphology, habitats, flora and fauna, cultural heritage, occupational health, waste and accidents.</p>	<p>Mitigation measures to mitigate possible impacts to the lowest possible level will be proposed through the EIA procedure, all in line with national legislation and EU requirements. Mitigation measures during the construction phase, MM during operation, MM in case of accident, MM after termination of use and socio-economic MM will include responsibilities of design company, contractor, engineer, operator and potential other parties.</p>	<p>The environmental protection and mitigation measures costs will be assessed in EIA procedure</p>	<p>Related costs will be assessed in EIA procedure</p>

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.

Major influences of the project **TRA-N-0302** on the economic and environmental dimensions are to be felt during the construction period (disturbance, traffic disturbance where secondary roads are cut, and impacts due to the dust, noise, transport machinery, and other machineries). The impacts on the environment are likely to appear in the following areas: air quality, noise, geomorphology, habitats, flora and fauna, cultural heritage, occupational health, waste and accidents. The proposed environmental protection measures include measures prescribed by national law and other regulations, protection measures in accidental situations, plans and technical solutions for environmental protection as well as other protective measures. Protection measures for reducing the possible impacts to the lowest possible level are proposed in the EIA procedures.

The preliminary EIA, which was conducted for project **TRA-N-0851** during the Pre-FS Report, considered potential impacts along the two potential pipeline routes. Most of the potential physical, biological and economic residual effects that could arise during construction and operation of the pipeline were considered to be reversible in the short- to medium-term. It was assessed that in no situation there was a high probability for the occurrence of a permanent or long-term residual effect that could not be technically or economically compensated. In conclusion, route Zagvozd-Posušje-N.Travnik with the main branch to Mostar was selected as more acceptable and was recommended for further development in the next stages of the Project. ESIA for South Interconnection of BiH and Croatia by the route Zagvozd – Posušje – N. Travnik is currently in progress that will determine all possible influences on the environment that could occur and will propose protection measures in order to reduce possible impacts to the lowest possible level.

Major influences of the project **TRA-N-0068** on the economic and environmental dimensions are to be felt during the construction period (disturbance, traffic disturbance where secondary roads are cut, and impacts due to the dust, noise, transport machinery, and other machineries). The impacts on the environment are likely to appear in the following areas: air quality, noise, geomorphology, habitats, flora and fauna, cultural heritage, occupational health, waste and accidents. The proposed environmental protection measures include measures prescribed by national law and other regulations, protection measures in accidental situations, plans and technical solutions for environmental protection as well as other protective measures. Protection measures for reducing the possible impacts to the lowest possible level are proposed in the EIA procedures.

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

The implementation of the projects within this Group will have significant positive impact on the integration of the Croatian, BiH ... gas markets.

The construction of the pipelines from this Group will enhance security of supply for BiH (current N-1 = 0) and provide additional volumes of gas available to the market. Group will create a potential for using gas for power generation in BiH. Natural gas consumption means using clean, environmentally friendly source of energy, because it is of low-carbon intensity compared to other fossil fuels. Therefore, use of gas for heating and power generation lead to reduction of environmental pollution i.e. reduction of CO₂, SO₂, NO_x and PM emissions. Thus, Project will improve the situation with air pollution in BiH that significantly increases during the winter season and especially in urban areas. The main economic benefits from the implementation of the Project are the savings made on avoiding interruptions in gas supply when the existing connection is cut (because of the age and poor condition) and savings from the avoidance of gas disruptions on the route via Ukraine, from Russia. Other benefits include market enhancement, increased economic activity and employment growth, savings related to lower costs of gas purchase (potential less expensive supply sources become available) and increased bargaining power in negotiation with the current gas supplier.

The Group provides diversification of routes and supplies (significant cross-border effect, certain projects within this Group enables the connection of the SGC with the existing Croatian transmission system and the supply of CEE and SEE countries and facilitates the gasification of Montenegro, southern Croatia and Bosnia and Herzegovina.

F. Useful Links

The project website:

www.plinacro.hr

Network Development Plan:

PLINACRO:

<http://www.plinacro.hr/UserDocImages/dokumenti/Desetogodi%C5%A1nji%20plan%20razvoja%20PTS%202018-2027.pdf>

(NDP 2018-2027, page 64)

BH-Gas:

Framework Energy Strategy of Bosnia and Herzegovina until 2035:

http://www.mvteo.gov.ba/data/Home/Dokumenti/Energetika/Framework_Energy_Strategy_of_Bosnia_and_Herzegovina_until_2035_ENG_FINAL....pdf

Conclusion of Government of Federation of BiH on Strategic importance of the South Interconnection of BiH and Croatia Gaspipeline Project, route Zagvozd (CRO) – Posušje (BiH) – Novi Travnik with branch to Mostar:

http://www.fbihvlada.gov.ba/bosanski/sjednica_v2.php?sjed_id=642&col=sjed_saopcenje