

SNTGN TRANSGAZ SA

**DEVELOPMENT PLAN FOR THE
NATIONAL GAS TRANSMISSION
SYSTEM**

2024-2033

Updated September 2025

Updated 2025



CONTENTS

1. INTRODUCTION	4
1.1 Update and additions to the 2024-2033 TYNDP	6
2. COMPANY PROFILE	8
2.1 The company's core business	8
2.2 Shareholding	9
2.3 Organization and management	9
3. DESCRIPTION OF THE NATIONAL GAS TRANSMISSION SYSTEM	11
4. ROMANIAN AND REGIONAL GAS MARKET	13
4.1 Romanian gas market	13
4.2 Natural gas market in the region and possibilities for natural gas supply	15
4.3 The conclusions of the regional gas market analysis	24
5. GAS CONSUMPTION, PRODUCTION AND STORAGE	26
5.1 Gas consumption	26
5.1.1 2015-2024 gas consumption history	26
5.1.2 Seasonal consumption and consumption peak	27
5.1.3 Gas consumption forecasts	28
5.2 Gas production	29
5.2.1 2015-2024 gas production history	29
30	
5.2.2 Forecast of the domestic gas production 2025-2033	30
5.3. Underground gas storage	31
5.3.1 Current context of the underground gas storage activity	31
6. SECURITY OF GAS SUPPLY	34
7. DEVELOPMENT PATHS FOR THE NATIONAL GAS TRANSMISSION SYSTEM (NTS)	38
7.1 Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	39
7.2 Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	40
7.3 Development on the Romanian territory of the Transmission Corridor for taking over the Black Sea gas (Tuzla – Podișor)	42
7.4 Expansion of the National Gas Transmission System, part of the Vertical Corridor	43
7.5 Romania – Serbia Interconnection – interconnection of the national gas transmission system with the similar gas transmission system in Serbia	44
7.6 Development/Upgrading of the gas transmission infrastructure in the North-Western part of Romania	46
7.7 Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	47
7.8 Eastring-Romania	48
7.9 Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	49
7.10 Development of the SCADA system for the National Gas Transmission System	50
7.11 Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	52

7.12 Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	54
7.13 Interconnection between NTS and the Black Sea LNG Terminal	55
7.14 Black Sea LNG terminal.....	56
8. DIRECTIONS FOR THE DEVELOPMENT OF THE NATURAL GAS STORAGE SYSTEM	57
I. DEPOGAZ PLOIEȘTI-MAJOR STORAGE PROJECTS.....	58
8.1 Increasing the daily extraction capacity at the Bîlciurești Storage Facility - Upgrading the infrastructure of the natural gas storage system-Bîlciurești.....	58
8.2 Increasing the underground natural gas storage capacity of the Ghercești storage facility.....	60
8.3 New underground natural gas storage facility in Fălticeni (Moldova)	61
8.4 Increasing underground natural gas storage capacity at the Sărmășel storage facility (Transylvania) 62	
8.5 Upgrading of the natural gas storage infrastructure – Bălăceanca.....	64
II. DEPOMURES TÂRGU-MURES-MAJOR STORAGE PROJECT.....	65
8.6. Storage unit –Depomureș.....	66
9. DEVELOPMENT DIRECTIONS FOR HYDROGEN TRANSPORT	67
9.1 The hydrogen market in Romania	67
9.2 Hydrogen production in Romania	68
9.3 Hydrogen consumption in Romania	68
9.4 The estimation of hydrogen consumption	68
9.5 Transgaz projects for hydrogen transmission	69
9.5.1 Gas transmission infrastructure repurposing projects for hydrogen transmission	70
9.5.1.1 Upgrading of the Isaccea - Jupa pipeline for hydrogen transmission	70
9.5.1.2 Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission.....	71
9.5.1.3 Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission	72
9.5.1.4 Upgrade of the Onești - Ungheni pipeline for hydrogen transmission	73
9.5.1.5 Upgrade of the Romania - Serbia interconnection for hydrogen transmission	73
9.5.1.6 Upgrade of the Coroi-Medioșu Aurit pipeline for hydrogen transmission.....	74
9.5.1.7 Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission	75
9.5.1.8 Upgrading the Vadu - T1 pipeline for hydrogen transport.....	76
9.5.2 Dedicated hydrogen transmission line development projects.....	76
9.5.2.1 Hydrogen transmission line in the Giurgiu-Podișor-Bibeuști-Jupa-Horia-Nădlac direction.....	76
9.5.2.2 Hydrogen transmission line in the Black Sea - Podișor direction.....	77
10. ANALYSIS OF MAJOR PROJECTS	79
I. Analysis of major gas transmission projects.....	79
10.I.1 Status of Projects.....	79
10.I.2 Cost of Projects	81
10.I.3 Planning the implementation of Transgaz's natural gas transmission projects for the period 2024-2033.....	88
10.I.4 Benefits of natural gas transmission projects.....	89
II. Analysis of major storage projects.....	89
10.II.1. Status of Projects according to the Final Investment Decision (FID):	89
10.II.2. Cost of major storage projects	90
10.II.3. Planning of storage projects for the period 2024-2033	91
III. Analysis of major hydrogen transmission projects	92
10.III.1 Status of projects.....	92
10.III.2 Cost of hydrogen transmission projects	93
10.III.3 Planning the implementation of Transgaz's hydrogen transmission projects for 2024-2033.....	94
10.III.4 Benefits of hydrogen transmission projects	94
10.1 Comparison ENTSG TYNDP 2022 / Development Plan for the National Gas Transmission System 2024 – 2033 updated 2025	95

11. FINANCING OPTIONS.....	97
12. DO MINIMUM AND DO MAXIMUM SCENARIOS	98
13. 2025-2027 UPGRADING AND INVESTMENT PLAN FOR 2025-2027	100
14. CONCLUSIONS	112
Definitions and abbreviations.....	114

1. INTRODUCTION

According to the provisions of Art. 22 of European Directive EC/73/2009 on the obligation of all EU gas transmission system operators to prepare **TYNDPs**, Transgaz, as the technical operator of the National Gas Transmission System of Romania, prepared the **Development Plan for the gas transmission system for 2024-2033 (TYNDP 2024-2033)**.

This document presents the development directions of the Romanian gas transmission network and the major projects that the company envisages over the next 10 years. The goal is to achieve a maximum level of transparency with respect to the development and upgrading of the National Gas Transmission System (NTS) in order for the market players to be informed in a timely manner about the existing and planned transmission capacities, in order for the investment decisions regarding the gas transmission network to respond to the market demands, following public consultations.

The Development Plan for the National Gas Transmission System (NTS) for 2024-2033, prepared according to **Electricity and Gas Law no. 123/2012**, as further amended and supplemented, with the national objectives proposed by the National Energy Strategy 2025-2035 with 2050 outlook, by the updated National Integrated Energy and Climate Change Plan 2021-2030 (NIECP), by the National Recovery and Resilience Plan (NRRP) and by the National Hydrogen Strategy 2023 -2030 (SNH), is compliant with the European energy policy for:

- ensuring safety of gas supply;
- increasing interconnectivity between the national gas transmission network and the European network;
- increasing the flexibility of the national gas transmission network;
- the liberalization of the gas market;
- creating the integrated gas market in the European Union;
- ensuring the connection of third parties to the gas transmission system, according to specific regulations, within the limits of transmission capacities and compliant with the technological regimes;
- ensuring the gas supply to the Romanian towns;
- ensuring the connection to the natural gas network of new investments which generate work places;
- the development of the transmission system so that it is compatible with the gradual blending of hydrogen into natural gas in line with European targets, based on detailed analyses including relevant technical and economic aspects;
- development of the societal strategy for coupling hydrogen ecosystems and industrial centres to the integrated EU Hydrogen Backbone;
- ensuring a phased transition to climate neutral activity and strengthening resilience to climate change;
- meeting national and international (climate) requirements and regulations/National Integrated Energy and Climate Change Plan.

The Development Plan for the National Gas Transmission System (NTS) for 2024-2033 updated 2025:

- (a) presents the major development projects of the natural gas transmission system over the next ten years;
- (b) defines the investments in the natural gas transmission system that the company has decided to make in the next three years (IDMP 2025-2027).

While preparing the **TYNDP 2024-2033 updated 2025**, Transgaz has considered and analysed both the existing situation and the projected future for natural gas demand and production. The evolution of natural gas production, supply, import and export was analysed, taking into account the development of transmission and distribution systems, the planned development of gas storage facilities and the forecasted use of hydrogen in industry and transport.

Transgaz is a member of ENTSO-G (The European Network of Natural Gas Transmission System Operators) and when developing the Plan for the Development of the National Gas Transmission System for the period 2024-2033 updated 2025, the coordination with the TYNDP, GRIPs and 10-year development plans of the regional natural gas transmission operators was aimed at.

For the sustainable development of the natural gas transmission infrastructure in Romania, Transgaz proposes an extensive investment plan through the **TYNDP** enabling the alignment of the NTS with European transmission and operation requirements complying at the same time with the requirements of European regulations in the field of environmental protection and carbon footprint mitigation.

In this regard, Transgaz aims:

- to promote investment projects which contribute to the achievement of a sustainable gas transmission system in safety conditions stipulated in the applicable laws, with the limitation of the impact on the environment and the population;
- to carry out projects in such a way that the impact on the natural and anthropogenic environment is minimal;
- to execute projects in such a way that the impact on biodiversity is minimal
- carrying out the investment projects needed to connect and adapt the national gas transmission system to the European Hydrogen Backbone network.

According to the legal provisions, TYNDP 2024-2033 – updated 2025 is subject to the approval of the National Regulatory Authority for Energy (ANRE).

This document represents the update and supplementation of the Plan for the Development of the NTS for the period 2024-2033, as approved by ANRE by Decision 2717/17.12.2024.

1.1 Update and additions to the 2024-2033 TYNDP

- update the Major Projects List in Chapter 1 following the completion of works or the introduction of new projects;
- update of Chapters 2, 3, 4, 5 and 6 with the dates as at the end of 2024;
- update of major projects under Chapter 7;
- update of storage project development phase 8.6 under Chapter 8;
- update of Chapter 9 with the list of Projects related to Transgaz's Climate and Decarbonization Strategy;
- update of Chapter 10 - Analysis of major projects;
- update of Chapter 11 - Financing options;
- update chapter 12 - Do minimum and Do maximum scenarios;
- update of Chapter 13 - Upgrading and Investment Development Plan 2025-2027.
- update of Chapter 14 – Conclusions.

List of major projects

Project number	Project name	Status
	Development on the Romanian territory of the National Gas Transmission System on the Bulgaria – Romania – Hungary – Austria Corridor – Phase I	COMPLETED
	Development on the Romanian territory of the National Gas Transmission System on the Bulgaria – Romania – Hungary – Austria Corridor – Phase II	It was replaced with projects 7.1,7.2 2025
7.1	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	
7.2	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș – TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	
7.3	Development on the Romanian territory of the Southern Transmission Corridor for taking over the Black Sea gas	
	The interconnection of the national gas transmission system with the international gas transmission pipeline T1 and reverse flow Isaccea	COMPLETED
	NTS developments in North-East Romania for enhancing gas supply to the area and for ensuring transmission capacities to the Republic of Moldova	COMPLETED
7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	Re-named (former BRUA phase III) 2025
	NTS developments for taking over Black Sea gas	COMPLETED
7.5	Romania – Serbia Interconnection	
	Upgrading GMS Isaccea 1	COMPLETED
	Interconnection between the gas transmission systems of Romania and Ukraine in the Gherăești – Siret direction	It was removed 2022

Project number	Project name	Status
7.6	Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania	
7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	
7.8	Eastring-Romania	
7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	
7.10	Development of the SCADA system for the National Gas Transmission System	
7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	
7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	
7.13	Interconnection between NTS and the Black Sea LNG Terminal	
7.14	Black Sea LNG Terminal	
9.5.1.1	<i>Upgrading of the Isaccea - Jupa pipeline for hydrogen transmission</i>	
9.5.1.2	<i>Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission</i>	
9.5.1.3	<i>Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission</i>	
9.5.1.4	<i>Upgrade of the Onești - Ungheni pipeline for hydrogen transmission</i>	
9.5.1.5	<i>Upgrade of the Romania - Serbia interconnection for hydrogen transmission</i>	
9.5.1.6	<i>Upgrade of the Coroi-Medioșu Aurit pipeline for hydrogen transmission</i>	
9.5.1.7	<i>Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission</i>	
9.5.1.8	<i>Upgrading the Vadu - T1 pipeline for hydrogen transmission</i>	
9.5.2.1	<i>Hydrogen transmission line in the direction Giurgiu-Podișor-Bibeuști-Jupa-Horia-Nădlac</i>	
9.5.2.2	<i>Hydrogen transmission line in the Black Sea - Podișor direction</i>	

Project included in:

	TYNDP 2014-2023
	TYNDP 2017-2026
	TYNDP 2018-2027
	TYNDP 2019-2028
	TYNDP 2020-2029
	TYNDP 2024-2033
	TYNDP 2024-2033 updated 2025

2. COMPANY PROFILE

2.1 The company's core business

Transgaz is the technical operator of the National Gas Transmission System (NTS) ensuring the execution of the national strategy regarding the internal and international gas transmission and dispatching with efficiency, transparency, safety, non-discrimination and competitiveness, as well as the research and project development in its field, in compliance with the provisions of the European and national laws, the quality, performance, environment and sustainable development standards.

The National Gas Transmission Company TRANSGAZ SA established under Governmental Decision no. 334/28 April 2000 carries out the following activities:

- Natural gas transmission - monopoly regulated activity, with tariffs established based on the methodology issued by the National Energy Regulatory Authority;
- Gas dispatching, research and design in the field of natural gas transmission.

Transported natural gas

History

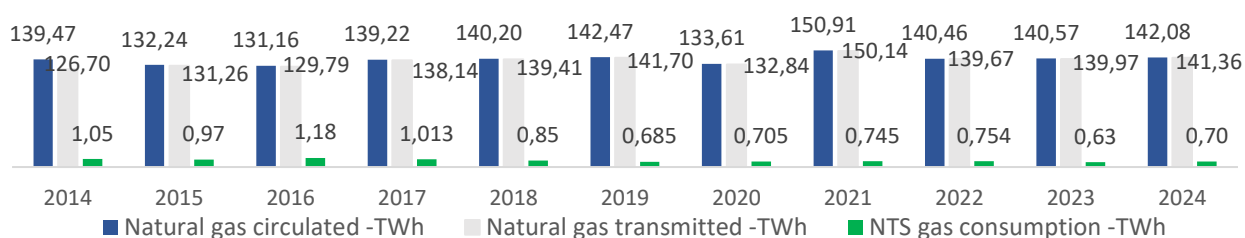


Chart 1 - Evolution of transported natural gas including gas for underground storage and NTS gas consumption for the period 2014-2024

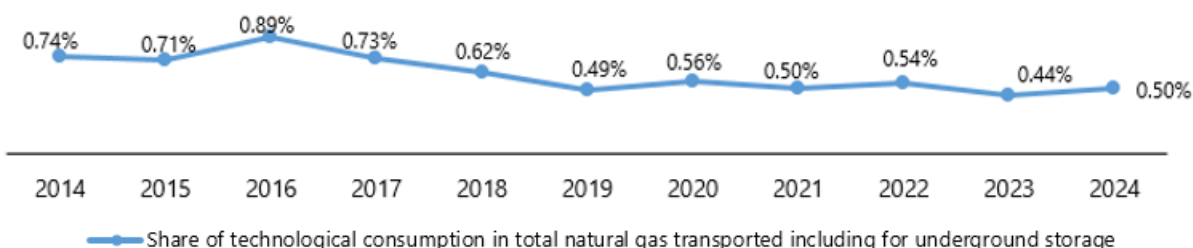
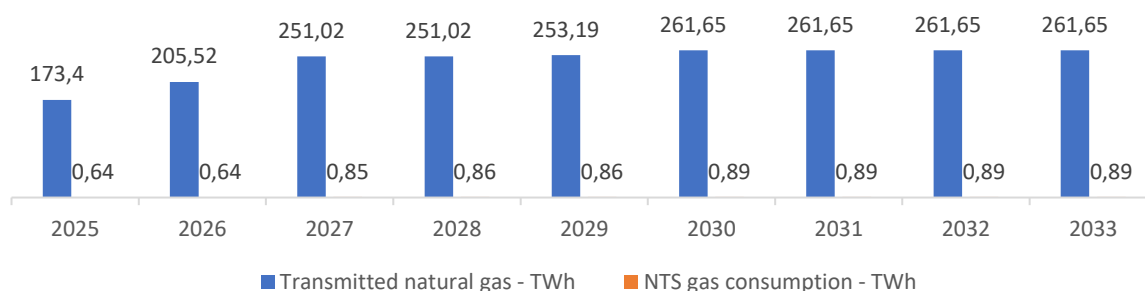


Chart 2 - The share of the NTS gas consumption in the total transmitted gas including gas for underground storage for the period 2014-2024

Forecasts of the transmitted gas quantities including the ones meant for underground storage and of the NTS gas consumption for the period 2025–2033:



Source: Internal – compliant with the data provided by Neptun Deep – Black Sea natural gas exploitation

Chart 3 - Forecasts of the transmitted gas quantities including underground storage gas for the period 2025-2033

2.2 Shareholding

The General Meeting of Transgaz' Shareholders approved by Decision no. 11 of 07.12.2022 the increase in the share capital by incorporating reserves from the net profit of previous financial years in amount of 1.766.076.600 lei, from 117.738.440 lei to 1.883.815.040 lei, by issuing 176.607.660 new shares, with a nominal value of 10 lei/share.

Therefore, as at 31 December 2024, Transgaz' share capital amounted to 1.883.815.040 lei and was divided into 188.381.504 nominative shares, each share having a nominal value of 10 lei.

Shareholding structure as at 31 December 2024

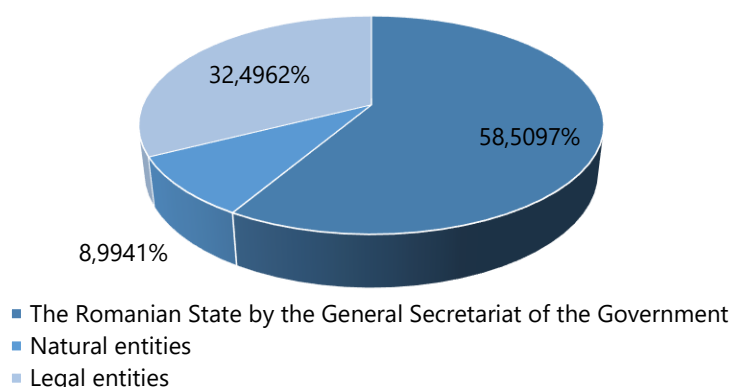


Chart 4 – Transgaz's shareholding structure as at 31 December 2023

2.3 Organization and management

The management of SNTGN Transgaz SA is ensured by:

- The General Meeting of Shareholders;
- The Board of Administration;
- The executive management delegated to the Director-General.

The Board of Administration delegated the company's management to Transgaz' Director-General. Transgaz' Director-General represents the company in the relations with third parties and is responsible for taking all measures related to the management, within the limits of the company's activity and in compliance with the exclusive powers reserved by law or by the Articles of Incorporation, the Board of Administration and the General Meeting of Shareholders.

TRANSGAZ is structured into functional organisational entities (divisions, units, departments, offices, compartments, etc.) and production entities (9 regional operating centres, sectors, laboratories, workshops, etc.).

SNTGN Transgaz SA carries out its activities at the following locations:

MEDIAS, SIBIU county

- **Transgaz' headquarters:**, no. 1 Piața C.I.Motaș, code 551130;
- **Maintenance Division:** no. 11, George Enescu St., code 551018;
- **Research and Design Division:** no. 6 Unirii St., code 550173.

BUCHAREST

- **Transgaz Representative Office – Romania:** no. 55 Primăverii bvd.;
- **General Inspection Division:** no. 155 Calea Victoriei, sector 1, Block D1, entrance 6, floor 3, code 010073;
- **VTP Operation Unit Bucharest:** no. 155 Calea Victoriei, sector 1, Block D1, entrance 6, floor 11, code 010073.

CHISINAU, the Republic of MOLDOVA

The subsidiaries of SNTGN Transgaz SA in the Republic of Moldova are as follows:

- Limited Liability Company „EUROTRANSGAZ”: no. 7/E Șoseaua Balcani, outside the built-up area, Ghidighici village;
- Limited Liability Company „VESTMOLDTRANSGAZ”: no. 7/E Șoseaua Balcani, outside the built-up area, Ghidighici village.



Figure 1 - Map of the territorial organisation of SNTGN Transgaz SA

3¹. DESCRIPTION OF THE NATIONAL GAS TRANSMISSION SYSTEM

The National Transmission System is represented by the main pipeline, as well as by the related facilities and equipment, operated at pressures ranging from 6 bar to 63 bar through which the gas is taken over from the production fields or imported and transmitted for delivery to internal gas market customers, export, international transmission.

Length of the National Gas Transmission System:

13.992,33 km

Compressor stations:

8 stations with an installed power of 79,6 MW

Neighbouring gas transmission system operators:

- FGSZ Hungary
- Bulgartransgaz EAD Bulgaria
- JP Srbijagaz Serbia
- LLC Gas TSO of Ukraine
- Vestmoldtransgaz, the Republic of Moldova
- Moldovatransgaz

Cross-border Entry (En)/ Exit (Ex) points:

- | | |
|--|--|
| <ul style="list-style-type: none"> Csanádpalota, FGSZ (HU); Ruse-Giurgiu, Bulgartransgaz (BG); Ungheni, Vestmoldtransgaz (MD); Negru Vodă 1/Kardam, Bulgartransgaz (BG); Negru Vodă 2/Kardam, Bulgartransgaz (BG); Negru Vodă 3/Kardam, Bulgartransgaz (BG); | <ul style="list-style-type: none"> Medieșu Aurit Import/GTSOU (UA); Isaccea Import/GTSOU (UA); Isaccea 1/Orlovka, GTSOU (UA); Isaccea 2/Orlovka, GTSOU (UA); Isaccea 3/Orlovka, GTSOU (UA). |
|--|--|

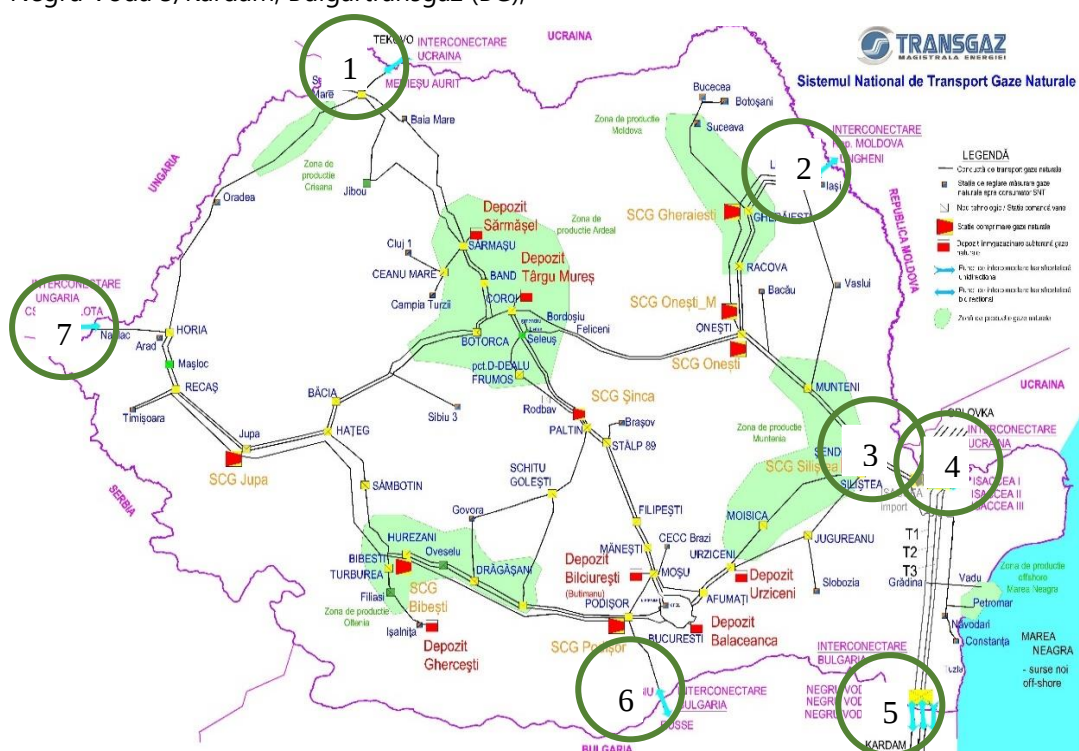


Figure 2 – Map of the National Gas Transmission System and the capacities at the cross-border interconnection points (bScm/year)

¹ As at 31.12.2024

1			
UA		RO	
Tekovo		Medieșu Aurit	
LLC GAS TSO		Transgaz	
Ex	2,71	→	2,71 En

2			
MO		RO	
Ungheni		Iași	
Vestmoldtransgaz		Transgaz	
Ex	0,73	→	0,73 En
En	2,19	←	2,19 Ex

3			
UA		RO	
Orlovka		Isaccea	
LLC GAS TSO		Transgaz	
Ex	6,85	→	6,85 En

4			
UA		RO	
Orlovka 1		Isaccea 1	
LLC GAS TSO		Transgaz	
Ex	6,85	→	6,85 En
En	4,12	←	4,12 Ex

5			
BG		RO	
Kardam		Negru Vodă	
Bulgartransgaz		Transgaz	
Ex	5,31	→	5,31 En
En	6,36	←	6,36 Ex

6			
BG		RO	
Ruse		Giurgiu	
Bulgartransgaz		Transgaz	
Ex	0,92	→	0,92 En
En	1,5	←	1,5 Ex

7			
HU		RO	
Szeged		Arad	
FGSZ		Transgaz	
Ex	2,63	→	2,63 En
En	2,63	←	2,63 Ex

In order to maintain the appropriate NTS technical conditions, Transgaz carries out the maintenance activity in the context of a predominantly preventive planned and corrective maintenance system, supported by annual investment programmes for development and upgrading.

The table below shows a synthesis of the limitations and interruptions scheduled following the repair/investment plans or the unforeseen limitations and interruptions following unexpected/accidental events for 2014-2024:

Period		Scheduled		Unscheduled	
		Limitations	Interruptions		Limitations
Calendar year	2014	5	43	5	158
	2015	8	64	8	164
	2016	7	43	38	160
	2017	11	44	0	198
	2018	0	5	8	121
	2019	1	17	6	72
	2020	1	19	3	57
	2021	1	30	12	134
	2022	0	29	1	90
	2023	2	7	2	77
	2024	0	19	2	122
Gas year	2016-2017	11	58	2	174
	2017-2018	0	5	7	138
	2018-2019	1	17	5	84
	2019-2020	1	18	3	56
	2020-2021	1	29	13	115
	2021-2022	0	31	2	112
	2022-2023	2	7	2	74
	2023-2024	0	18	2	120

4. ROMANIAN AND REGIONAL GAS MARKET

4.1 Romanian gas market

The current structure of the Romanian gas market includes (at the interface with Transgaz):

- 1 operator of the National Gas Transmission System – SNTGN TRANSGAZ SA MEDIAȘ;
- 13 gas producers: OMV Petrom SA, SNGN ROMGAZ SA, SC Amromco Energy SRL, SC Foraj Sonde SA, SC Raffless Energy SRL, Stratum Energy Romania LLC Wilmington the Bucharest Subsidiary, SC Hunt Oil SRL, SC Lotus Petrol SRL, SC Serinus Energy România, Dacian Petroleum SRL, Black Sea Oil & Gas SA; Petro Ventures Resources SRL; Gas Plus Dacia SRL;
- 2 underground storage facilities operators: SNGN Romgaz - the Underground Gas Storage Facility Depogaz Ploiesti and SC Depomureș Târgu Mureș;
- 28 gas distribution companies, the largest being Distrigaz Sud Retele Srl and SC Delgaz Grid;
- 158 licences gas suppliers.

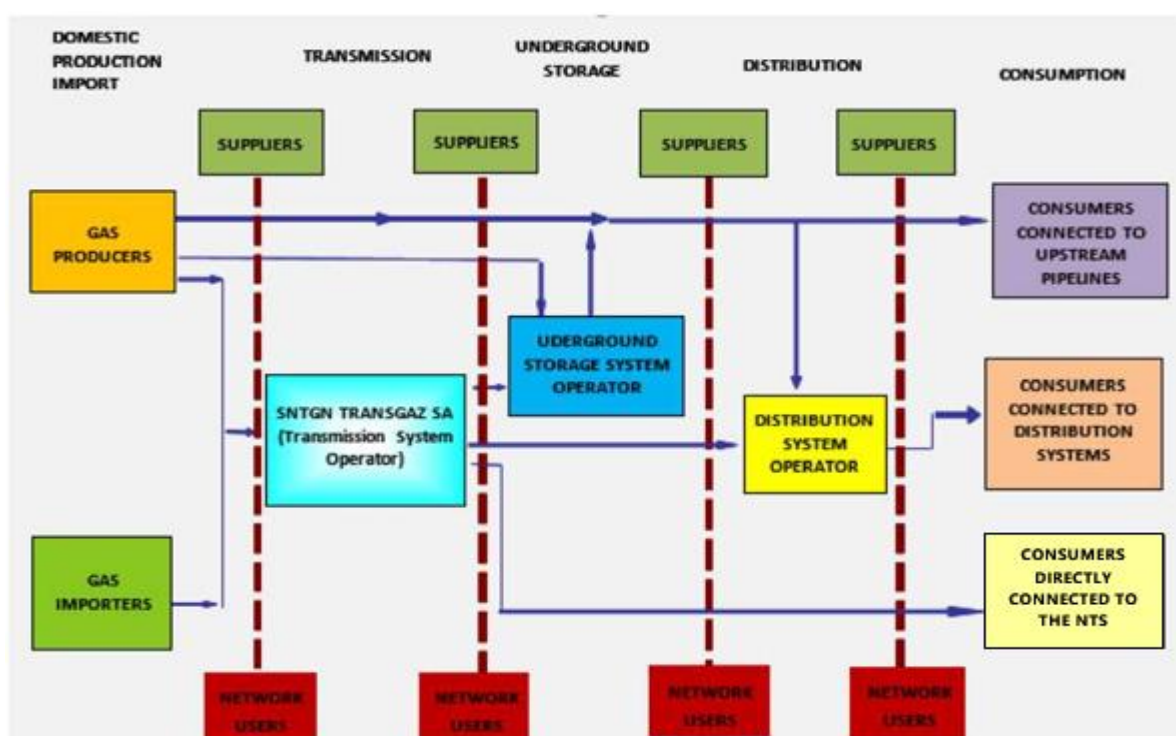


Figure 3 – Schematic representation of the Romanian gas market

Internal source

The internal gas market has two components:

- **the competitive segment**, which includes:
 - the *wholesale market* which functions based on:
 - bilateral contracts between the gas economic operators,
 - transactions on centralized markets managed by the operator of the gas market or the operator of the balance market, whichever the case,

- (iii) other types of transactions or contracts.
- the *retail market* where the suppliers sell gas to final clients through contracts with negotiated prices.
- **the regulated segment** which includes the natural monopoly activities, the related activities and gas supply at a regulated price, based on the framework agreements approved by ANRE.

The increase of the competitive market share is achieved gradually by ensuring access to this market for more participants, suppliers and final clients. The final clients can choose their supplier and can directly negotiate purchase agreements with the latter. Currently the degree of gas market openness is 100% for both industrial and residential consumers.

Romania's energy mix is diverse, incorporating a mix of fossil fuels, renewables and nuclear energy. Historically, Romania has relied heavily on fossil fuels, particularly coal and natural gas, to meet its energy demand. The country's extensive coal reserves have played a crucial role in ensuring energy security. In addition, natural gas has been a vital source of energy for both electricity generation and heating, providing a cleaner alternative to coal.

Natural gas accounts for about 29% of domestic primary energy consumption. Its significant share is explained by the high availability of indigenous resources, low environmental impact and the ability to balance power produced from intermittent renewable sources.

Romania's natural gas consumption has been decreasing in recent years mainly because the petrochemical industry, a major consumer of natural gas, has closed production capacity. With the reopening of these units and the replacement of coal-fired power generation capacity by gas-fired capacity, the expansion of gas transmission and distribution networks and the increase in domestic production following the start of gas exploitation in the Black Sea, natural gas consumption is expected to increase.

Over the next 3-4 years, natural gas consumption in Romania is expected to increase by about 10 billion cubic meters of natural gas through the construction of the Mintia power plant with a production capacity of 1700 MWH and a consumption of 2.5 billion cubic meters of gas per year through the construction of the two co-generation plants in Isalnita and Turceni, as part of the CEO restructuring plan, already approved by the European Commission, with a production capacity of 1200 MWH and a consumption of 1.5 billion cubic metres of natural gas, by the completion of the Iernut power plant, with a production capacity of 450 MWH and a consumption of 1 billion cubic metres of natural gas, and by the restart of the Azomures fertiliser plant, which consumes 1.2 billion cubic metres of natural gas per year, and by the restart of the Piatra-Neamt chemical plant, which consumes over 0.8 billion cubic metres of natural gas per year. In addition, an estimated additional consumption of 3 billion cubic metres per year will come from localities that will be connected to the natural gas network, where local authorities have already prepared distribution projects using the instruments at their disposal: NRRP, Modernisation Fund, RepowerEU, or Government Programmes such as Anghel Saligny.

Natural gas means economic development, a better quality of life for citizens and environmental protection. Horizontal development is not just about how natural gas will be harnessed, but also about the industry that makes it possible to extract, transport and process it. The entire economic ecosystem will benefit from the exploitation of natural gas.

In the context of development, the internal gas market aims at:

- the development of competition between gas suppliers;
- continuing to implement 'cap' pricing methods;
- stimulating the opening and/or the rehabilitation of gas deposits, in order to increase the internal production of gas and limit the dependency on imports;
- diversification of the import/export sources;
- flexibility of the storage system.

Transgaz, as technical operator of the NTS, has a very important role in ensuring the security of gas supply to the country and in the correct operation of the national gas market.

4.2 Natural gas market in the region and possibilities for natural gas supply

The conflict between Russia and Ukraine highlighted the importance of ensuring diversification of energy supplies and brought energy security to the forefront of European governments' concerns.

The situation in Ukraine required an immediate response from European and national authorities, and the sanctions imposed on Russia and the disruption of supply chains in the Black Sea basin had a direct impact on energy prices, which was reflected in the economy.

The effects in the energy sector showed the vulnerability of the Member States in relation to energy products imported from Russia, the natural consequence was for the EU to take the decision to ensure the Union's sustainable energy independence.

To achieve this goal, in May 2022 the European Commission presented the REPowerEU initiative - a planning document proposing to rapidly reduce dependence on fossil fuels from Russia. The REPowerEU plan sets out measures on diversification of energy suppliers, energy savings and energy efficiency, as well as an accelerated introduction of renewable energy.

The Commission set up the EU Energy Platform to aggregate regional energy demand and facilitate future joint purchases of green gas and hydrogen, to ensure the best use of infrastructure so that gas reaches where it is most needed, and to establish links with international supply partners.

Five Member State regional groups have already been initiated under the platform and a dedicated task force has been set up within the Commission to support this process. The EU is managing to move away from gas imports from Russia thanks to increased LNG imports and pipeline imports from other suppliers.

The European Gas Demand Reduction Plan sets out measures, principles and criteria for coordinated demand reduction. The plan focuses on substitution of natural gas by other fuels and overall energy savings in all sectors - **Energy saved in summer means energy available for winter**. It aims to **safeguard supplies to households** and **essential users** such as hospitals, but also to industries that are crucial to the supply of essential products and services to the economy, as well as to the EU's supply chains and competitiveness. The plan gives Member States guidelines to take into account when planning to reduce.

The demand reduction plan **also helps Member States to identify and prioritise**, within their 'unprotected' customer groups, **the most important customers or installations**, based on overall economic considerations and the following criteria:

- **Critical societal importance** - sectors including health, food, safety, security, refining and defence, as well as the provision of environmental services;
- **Cross-border supply chains** - sectors or industries providing goods and services critical to the smooth functioning of supply chains in the EU;
- **Damage to installations** - to avoid them being unable to resume production without significant delays, repairs, regulatory approval and costs;
- **Gas reduction possibilities and product/component substitution** - the extent to which industries can switch to imported components/products and the extent to which demand for products or components can be met by imports.

By phasing out reliance on fossil fuel sources and reducing the EU's overall energy consumption as a result of increased energy efficiency, the **European Green Deal and the 'Fit for 55' package strengthen security of supply to the EU**. Based on these proposals, REPowerEU aims to accelerate the development of renewable energy across the EU and the start of energy efficiency investments.

Currently, more than 20% of EU energy comes from renewable sources, and the Commission has proposed that this share should be more than double and reach at least 45% by 2030.

With investment in LNG terminals and gas interconnectors, each Member State can now receive gas from at least two sources and two-way flows between neighbours are possible. Under the Security of Gas Supply Regulation, Member States are required to draw up national preventive action plans and emergency plans, as well as a solidarity mechanism to ensure the supply of 'protected customers' in neighbouring countries in a major emergency situation.

By exploiting the potential of the Black Sea and deep onshore resources, by supporting domestic natural gas production, Romania can achieve a sufficiently high level of domestic production to become an energy security provider in the region.

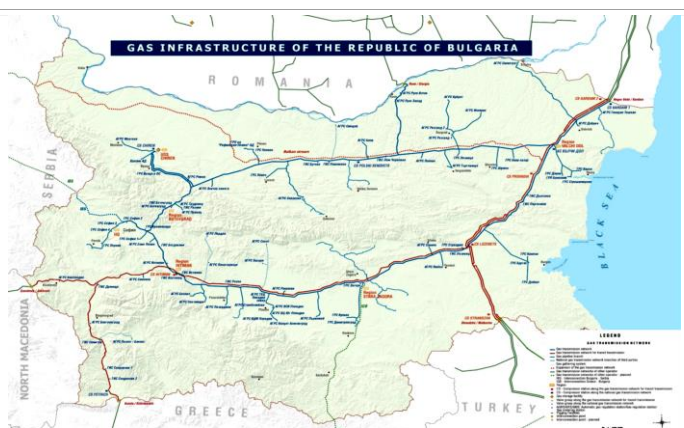
A strong internal market contributes significantly to a high degree of energy security.

The natural gas transmission network is a particularly important infrastructure for the country's energy security. Romania will become a European natural gas transmission corridor by connecting to the European North-South and East-West corridors, by interconnecting pipelines with its neighbours and by natural gas infrastructure projects currently under construction or planned for the development of the domestic network.



Figure 4 - Lengths of natural gas transmission systems of neighbouring countries

BULGARIA

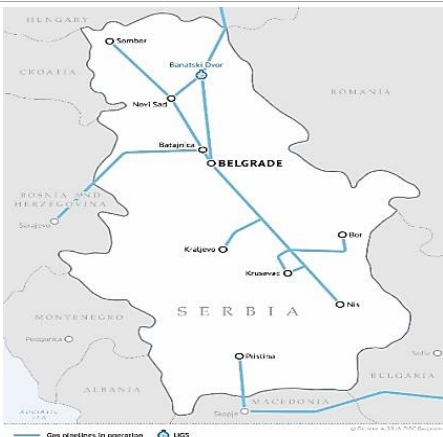
BULGARIA	
Natural gas consumption (2022)	2.7 bcm
National Transmission System Operator	Bulgartransgaz EAD
Shareholding structure	100% – Bulgarian Energy Holding EAD
Volume of gas transported (2023)	Consumers and storage – 8 mld.Mc Transit – 17,8 bcm/year until 2030 TOTAL: 25,8 bcm
Length of the natural gas transmission system	3.276 km
Natural Gas Transmission System Map	

BULGARIA	
Description of the natural gas transmission system	The national Bulgarian gas transmission system is circular in shape, with a total length of 3,276 km, with: ✓ 11 compressor stations: CS Kardam-1, CS Kardam-2, CS Valchi Dol și CS Polski Senovets, CS Rasovo, CS Provadia, CS Nova Provadua, CS Lozenets, CS Strandzha, CS Ihtiman and CS Petrich with a total installed capacity of 406 MW; ✓ 240 exit points from the system; ✓ 2 connection points with production facilities; ✓ 1 connection point with storage facilities; ✓ 9 interconnections; ✓ 1 interconnection point within the country.
LNG	-
Interconnections	Romania: Negru Vodă I, II and III/Kardam–Transgaz Romania Ruse/Giurgiu – Transgaz Romania Greece: Kulata/Sidirokastron – DESFA Greece IGB Turkiye: Strandzha/Malkoclar – BOTAS Turkiye Strandzha 2/Malkoclar - TAGTAS, Turkiye Macedonia: Kyustendil/Zidilovo – GA-MA , North Macedonia Serbia: Kireevo/Zaychar – Gastrans, Serbia
Storage facilities	Chiren–Bulgartransgaz –Installed capacity 9MW; Storage capacities 5,8 mill. MWh/d
Investment program	The development plan for the period 2023-2032 is available at: https://bulgartransgaz.bg/files/useruploads/files/amd/TYNDP%2023-2032%20EN.pdf
Main investments	– Rehabilitation, Upgrading and Development of the NTS; – Construction of a gas pipeline between BG-RO (investment in the Bulgarian system to increase capacity within the BRUA project); – LNG Terminal Alexandroupoli, Greece; – Eastring-Bulgaria; – Expansion of storage capacity at Chiren; – Construction of a pipeline to increase capacity and interconnection with the existing system in the form of a ring between CS ValchiDol and Novi Iskar valve station; – Construction of a pipeline between Varna and Oryahovo; – Construction of a pipeline to increase capacity and interconnection with the existing system in the form of a ring between CS Provadia and Rupcha; – Construction of new storage facilities on the territory of Bulgaria.

Source: www.bulgartransgaz.bg, <http://ec.europa.eu/eurostat>, www.gie.eu, entsog.eu

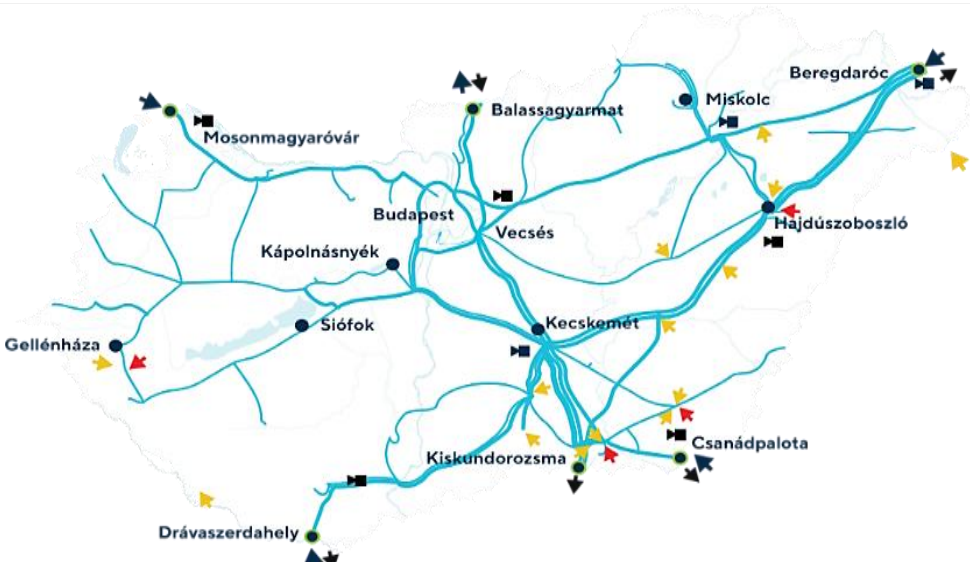
SERBIA

SERBIA	
Natural gas consumption (2022)	2,93 bcma
National Transmission System Operator	JP SRBIJAGAS
Shareholding structure	100% - Serbian state.
Volume of gas transported (2023)	In 2023 the volume of NG transported was 13 million cm.

SERBIA	
Length of the natural gas transmission system	2.501 km – pipelines.
Natural Gas Transmission System Map	
Description of the natural gas transmission system	✓ The Serbian transmission system is operated by JP Srbijagas, with the exception of the MG-9 section from Pojate to Niš which is operated by Yugorosgaz (a subsidiary of Gazprom); ✓ PN in the system is 16-50 bar; DN 150-750; ✓ 32 gas distribution stations; ✓ 1 compressor station at Batajnica; ✓ storage facility with a maximum capacity of 550 million cubic meters.
LNG	-
Interconnections	Hungary: Horgoš-Kiskundorozsma-FGSZ HU Bosnia and Herzegovina: Mali-Zvornik-BH Gas d.o.o. BH YUGOROSGAZ: Pojate-YUGOROSGAZ (Gazprom subsidiary) Bulgaria: Niš-Dimitrovgrad-Bulgartransgaz BG
Storage facilities	Banatski Dvor SRBIJAGAS Total capacity 550 mill. cm
Investment program	JP SRBIJAGAS natural gas transmission system development plan 2022- 2031 can be found on the website: https://www.transportgas-srbija.rs/en/o-nama/plan-razvoja
Main investments included in the program	Investments: The company's investments focus on: – upgrading and retrofitting of the Serbian NG transmission system (pipelines, connections, equipment, utilities, etc.); – upgrading of transmission capacities; – development of the Banatski Dvor storage system (increase to 800 million cubic metres - 1 billion cubic metres). – Implementation of PCIs agreed by the European Commission: – construction of an interconnector with Romania, 97 km long (12.8 km on the territory of the Republic of Serbia) and with a capacity of 1.2 bcm/year, which would make it possible to implement a future interconnection with Croatia of Serbia; – the construction of an interconnector with Bosnia-Herzegovina (Rep. Srpska), 90 km long, DN500 diameter, 50 bar pressure and a maximum capacity of 1.2 bcm/year; – the possibility of the construction of an interconnector with Montenegro (with the possibility of bidirectional flow), 114 km long, diameter DN500, pressure 50-40 bar, and a maximum capacity of 1,000 million cm/year; – construction of an interconnector with Croatia, 95 km long, diameter DN600, pressure 75 bar and capacity of 1,500 million cubic metres/year; – the possibility of the construction of an interconnector with Macedonia, 70.7 km long, diameter DN: 300, pressure 50 bar and capacity 380 million cubic metres/year.

Source: transportgas-srbija.rs, Internet, <http://ec.europa.eu/eurostat>

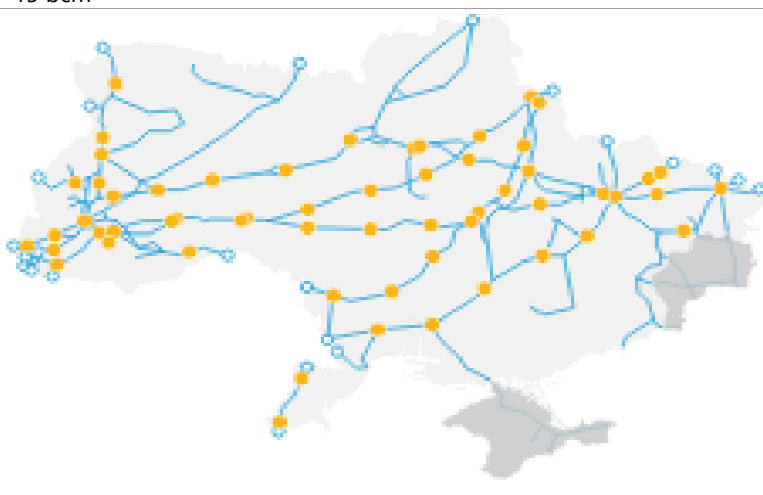
HUNGARY

HUNGARY	
Natural gas consumption (2023)	10 bcm
National Transmission System Operator	FGSZ Zrt.
Shareholding structure	MOL Plc. – 100%
Volume of gas transported (2023)	În anul 2023 volumul de GN transportat a fost de 29,6 mld mc.
Length of the natural gas transmission system	5.889 km – conducte magistrale
Natural Gas Transmission System Map	
Description of the natural gas transmission system	✓ 25 entry points; ✓ 400 exit points; ✓ infrastructure with DN between 80-1400 mm; ✓ 8 compressor stations; ✓ 6 technical control centres attached to 3 regions; ✓ 1 technical control centre in Siófok; ✓ 7,229 km of fibre optic for telecommunications; ✓ gas transported at PN between 40-75 bar.
Storage facilities	Zsana Magyar Foldgaztaro Hajuszoboszlo Magyar Foldgaztaro Pusztaderics Magyar Foldgaztaro Kardosku Magyar Foldgaztaro Szoreg-1 MMBF Foldgaztaro Total capacity 6 bcm
LNG	-
Interconnections	Interconnections with: Ukraine: Beregdaroc–Ukrtransgas (UA) Austria: Mosonmagyarovar–OMV Gas (AT)

HUNGARY	
	Serbia: Kiskundorozsma–Srbijagas (RS) Romania: Csanádpalota–Transgaz (RO) Croatia: Dravaszerdahely–Plincro (HR) Slovakia: Balassagyarmat–Eustream Slovakia (SK) Slovenia: Pince-Tornyiszentmiklós
Investment program	The 10-year natural gas transmission system development plan of FGSZ Zrt. for 2022-2031 is presented at http://fgsz.hu/en/about-fgsz
Main investments included in the program	Development projects of FGSZ Zrt.: Ensuring an entry capacity on the Serbia-Hungary route of max. 6 bcm/year Increasing the entry capacity in the Serbia-Hungary direction to 8.5 bcm/year Development of the Csanádpalota compressor station and metering station Ensuring capacity demand from Hungary to Ukraine and on the HU>AT direction Ensuring capacity on the Slovenia-Hungary interconnector between 20,000-190,000 m ³ /h Development of the SZADA compressor station Development of the Dorog compressor station Construction of Kozármisleny-Kaposvár pipeline Securing capacity on Hungary-Austria interconnector Development of Hydrogen corridors (HU/UA, HU/HR, HU/SK, HU/RO, HU/AT, HU/SI) Replacement of gas turbine compressors with electrically driven compressors Construction of the Kiskundorozsma - Városföld pipeline Construction of the Eastwing in the direction RO>HU>SK with transmission capacities between 10-40 bcm/year.

Source: gie.eu, <https://fgsz.hu>, <http://ec.europa.eu/eurostat>, entsog.eu

UKRAINE

UKRAINE	
Gas consumption (2023)	19 bcm
Transmission operator	LLC Gas TSO of Ukraine vby two operators Branch and LLC
Length of transmission system (2021)	33.190 km pipelines
Transited gas volume (2021)	15 bcm
Map of the Natural Gas Transmission System	
Description of the natural gas transmission system (2020)	The transmission is characterised by infrastructure with: ✓ 1,389 gas distribution stations + 83 gas distribution stations in occupied territories; ✓ 71 compressor stations + 2 compressor stations in the occupied territories (Donetsk and Lugansk);

UKRAINE	
	✓ 87 compressor stations + 2 compressor stations; ✓ 41 NG distribution companies connected to the Ukrainian gas transmission system; ✓ 153 direct consumers; ✓ 11 underground NG storage facilities with a capacity of 30.5 bcm + 1.4 bcm in the occupied territories (Donetsk and Lugansk).
Power of the compressor stations	Transmission: 4.581 MW Storage: 10 MW
Interconnections	Romania: Orlovka–Isaccea (RO) Tekovo–Medieșu Aurit (RO) Russia: Platovo RU/UA Prokorovka RU/UA Sokhranovka RU/UA Pisarevka RU/UA Serebryanka RU/UA Valuyki RU/UA Volchansk RU/UA Belgorod RU/UA Sudzha RU/UA Belarus: Kobryn Belarus–UA Polonia: Hermanowice–Polonia/UA Slovakia: Budince–Slovakia/UA Hungary: Beregdaroc (HU)–Beregovo (UA) Moldova: Oleksiivka–MD/UA Grebenyky–MD/UA
Storage facilities	12 underground storage facilities with a capacity of 30.95 bcm Krasnopopivske–PJSC Ukrtransgaz Olyshivske–PJSC Ukrtransgaz Bohorodchanske–PJSC Ukrtransgaz Uherske (XIV–XV)–PJSC Ukrtransgaz Oparske–PJSC Ukrtransgaz Solokhivske–PJSC Ukrtransgaz Dashavske–PJSC Ukrtransgaz Kehychivske–PJSC Ukrtransgaz Chervonopartyzanske–PJSC Ukrtransgaz Bilche–Volytsko–Uherske–PJSC Ukrtransgaz Proletarske–PJSC Ukrtransgaz Verhunske–PJSC Ukrtransgaz
Natural gas Import (bcm) (2021)	2,6 (six times less than in 2020)
Domestic production (bcm) (2022)	18,5
Future projects	Development and upgrading ✓ of natural gas transmission pipeline networks and ancillary parts ✓ compressor stations ✓ telecommunications system ✓ gas storage system ✓ gas transmission system monitoring ✓ alternative fuel sources It is important to underline Ukraine's interest both in physical reverse flow at the interconnection points with the Romanian system, but especially at the Isaccea 1 point, thus ensuring deliveries of natural gas

UKRAINE	
	from the South-East via the Bulgarian transmission system and the I transit line.

Source: tsoua.com, utg.ua, spglobal.com, www.reuters.com, <http://ec.europa.eu/eurostat>, www.entsog.eu, www.gie.eu

REPUBLIC OF MOLDOVA

REPUBLIC OF MOLDOVA	
Natural gas consumption (2023)	398 million cm
National Transmission System Operator	Vestmoldtransgaz SRL
Shareholding structure	75% - SNTGN Transgaz S.A. and 25% - EBRD
Transported gas volumes	In 2023 the volume of natural gas transported was 423 million cm.
Length of the natural gas transmission system	1.682,5 km
Natural Gas Transmission System Map	
Description of the transmission system (2023)	✓ 776,315 km of main pipelines; ✓ 906,206 km of connection pipelines; ✓ maximum capacity of the transmission system - 20 bcm/year; ✓ 3 GCS with a total capacity of 75.5 MW; ✓ 7 SGNC; ✓ 81 Gas delivery stations; ✓ 226 Cathodic protection stations; ✓ 84 MRSs;

REPUBLIC OF MOLDOVA	
	✓ 2 GMS: Căușeni și Ungheni; ✓ 2.200 km of cable telecommunications lines.
LNG	-
Power of the compressor stations (2023)	✓ GCS Drochia with a total capacity of 31,5 MW; ✓ GCS Șoldănești with a total capacity of 24 MW; ✓ GCS Vulcănești with a total capacity of 20 MW.
Interconnections (2021)	The transmission system of the Republic of Moldova is, in fact, a transit system (through the 8 main pipelines: ATI, RI, ȘDKRI, ACB, ChR, OCh, TCM, OIS) of gas via Ukraine from Russia to the states of the Balkan Peninsula and the south of the republic. The Moldovan transmission system has 6 interconnection points, including 1 interconnection point (reverse-flow system) with Romania: L-120 km; Capacity RO-MD - 1.88 bcm/year MD-RO - 0.73 bcm/year The capacity requested for booking is carried out through the GMOIS platform managed by SNTGN Transgaz SA. <u>Moldovatrangaz and Vestmoldtransgaz</u> Romania: Ungheni (IUC) RO-MD Ukraine: GMS Alexeevca (ACB) UA-MD GMS intermediare Ananiev/Orlovca (ACB) UA-MD GMS Grebeniki (ATI) UA-MD, GMS Grebeniki (RI, SDKRI) UA-MD, GMDS Limanscoe (TO 3) UA-MD Căușeni (ATI) MD-UA, Căușeni (RI, SDKRI) MD-UA Virtual exit point to consumers in Ukraine (Vestmoldtransgaz)
Investment Program	<i>Vestmoldtransgaz's natural gas transmission system development plan 2023-2032 is available on the website:</i> <i>https://www.vmtg.md/images/PLANURI/H_CA_ANRE_nr_820_Plan_de_Dezvoltare_2023-2032_Vestmoldtransgaz.pdf</i>
Main investments included in the programme	Investments: The company's investments focus on: – technical reuse, reconstruction and modernisation of existing transmission facilities (CS, GDS, GMS, CPS, data transmission networks, etc.); – optimisation of existing ones and introduction of new capacities with automated control of technological equipment operating processes; – introduction of tele-mechanical and telemetry systems for the control of the main technical elements (linear valve nodes, cathodic protection) on gas main pipelines, with the possibility of transmitting the necessary information to the central dispatching, in order to ensure the safe operation of the transmission system; – ensuring the safe and accident-free operation of the transmission system for the gas transmission to distribution system operators as well as for gas transit to the Balkan region and Turkey, eliminating emergency situations; – optimising the loads of existing pipelines; – extension of the Iasi-Ungheni-Chisinau Interconnector (Phase II); – construction of the natural gas transmission network with DN 500 on the Ungheni-Balti segment, with connection to the northern transmission network "Ananiev-Cernauti-Bogorodicieni"; – construction of the natural gas compressor station located in Ungheni district.

Source: www.moldovatrangaz.md, <http://ec.europa.eu/eurostat>

4.3 The conclusions of the regional gas market analysis

The information about the neighbouring countries' gas markets indicates an important dependency of these markets on import gas sources.

If until recently the only gas supply source for these countries was Russia, today, through the planning and implementation of new infrastructure projects, the neighbouring countries seek to diversify these sources, in order to increase the reliability of gas supply and to ensure competitive prices.

The orientation of the gas transmission system operators from neighbouring countries towards creating new cross-border transmission capacities, or increasing the already existing ones, clearly shows the preoccupation for an important increase in interconnectivity in a European region that wishes to have a fully integrated market.

Romania is in a privileged position today thanks to major investments in gas transmission infrastructure. As a result, Romania is of particular importance in the region, representing a hub that can ensure energy security and gas supply from diversified sources.

After the construction of the Turkish Stream 2 pipeline in Bulgaria and Serbia, the pipelines on the Transbalkan Corridor became unused in the North-South direction. As a result, Transgaz transformed these pipelines from one-way to two-way pipelines by investing its own forces and thus created the conditions for transporting natural gas on the South-North direction from the Southern Corridor through the Transbalkan pipelines at a capacity of 14 billion cubic meters/year from Azerbaijan and LNG from terminals in Turkey and Greece to Romania and Europe.

The fact that we are reverse-flow interconnected allows us to import natural gas from different corridors. Until 5 years ago there was only the option of importing Russian gas through the T1 transit pipeline. Now things are radically different. We can import gas from Hungary, from Bulgaria, from the Caspian Sea, via the TANAP and then TAP pipelines, via the Vertical Corridor, or even liquefied natural gas from Greek or Turkish terminals. This demonstrates two important aspects: first, that Romania is a country with vision and courage to act in the gas sector, which is important for the present and the future; and second, that Transgaz is a leader in the regional energy sector.

The Vertical Corridor, a component of the South-North Corridor of the 3 Seas Initiative (3SI), will contribute to the diversification of natural gas sources and increase the security of natural gas supply to Central and Eastern Europe and the Balkans.

The integration of BRUA into the Vertical Corridor transforms Romania into an important player on the gas market in the region. Natural gas will be transported through Greece to other countries via several entry and exit points and from different sources of supply (Azerbaijan, Qatar, Algeria, Egypt, Iran ,etc.).

The meeting on 11 January 2024 in Bucharest of the heads of the signatory TSOs of the MoU on the Vertical Corridor was an important step towards the enabling of a bi-directional corridor of natural gas flows from Greece and Turkey to Central and Eastern Europe and the Balkans, respectively to the Republic of Moldova and Ukraine and vice versa, the development of the Vertical Corridor activity, interconnecting the gas transmission networks in Greece, Bulgaria, Romania and Hungary, allowing bi-directional gas flow by involving non-EU countries (Ukraine, Republic of Moldova) as this approach is relevant for the implementation of the Vertical Corridor, the

harmonisation of planned developments in the region, taking into account the expectations of CESEC and relevant EU strategies and policies and regional aspects.

On 19 January 2024, on the sidelines of the CESEC meeting in Athens, gas infrastructure operators participating in the Vertical Corridor initiative signed a new Memorandum of Understanding which included as signatories operators from the Republic of Moldova (Vestmoldtransgaz), Ukraine (GTSO) and Slovakia (Eustream). The Vertical Corridor is operational and gas can be brought in from Azerbaijan.

In the second phase, Bulgartransgaz needs to build another 63 kilometres, which could bring the total gas volume up to 15 billion cubic metres, including gas from the Caspian Sea and liquefied gas from Turkey.

The operators (TSOs) of the national gas transmission systems of several Eastern European and Balkan countries are preparing to apply for non-reimbursable EU funds from the Modernisation Fund to strengthen their pipeline networks and increase interconnections between them in order to diversify the gas supply sources of the countries concerned by enhancing access to liquefied natural gas (LNG) from liquefaction terminals in Greece and Turkey.

The Vertical Corridor, created at Transgaz' initiative will bring prestige to Romania but also energy security for Eastern European countries, the Republic of Moldova and Ukraine, as well as Central Europe: Hungary, Slovakia, Poland, Austria, Czech Republic, etc. Transgaz is confident in the synergy of the Technical System Operators of Greece, Bulgaria, Romania, Hungary, Ukraine, Republic of Moldova and Slovakia, in the significant impact they can bring in increasing and strengthening the energy security of those countries, the region and the European Union.

A coordinated development of these countries' systems and interconnection capacities can contribute to the transformation of the region and the continent in terms of gas supply security and enable Romania to become a pole of economic development in Europe.

In all this picture **Romania** is the country with the market with the lowest dependence on imported natural gas, but it can become a gateway for natural gas from Greece through Bulgaria to Central and Eastern Europe. Adding to this picture, in addition to its favourable geostrategic position, the resources discovered in the Black Sea, Romania could clearly play a defining role in the region.

In this context, the natural gas transmission infrastructure becomes the most important factor, and **Transgaz** is facing a major challenge: the development - as soon as possible - of natural gas transmission corridors that ensure both the necessary degree of interconnectivity at European level and sufficient natural gas transmission potential to exploit resources on the domestic and regional markets.

5. GAS CONSUMPTION, PRODUCTION AND STORAGE

5.1 Gas consumption

5.1.1 2015-2024 gas consumption history

The total gas consumption in the Romanian market in the period 2015–2024:

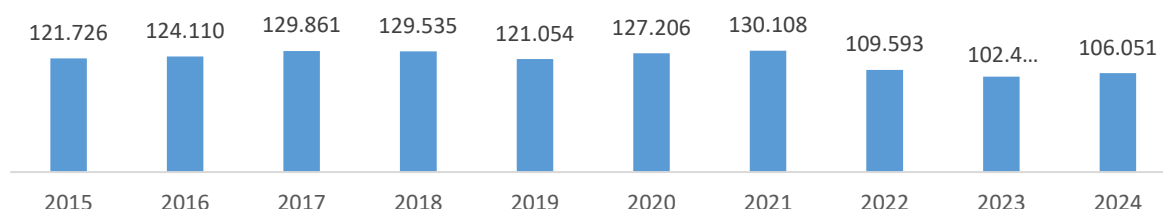


Chart 5 -The gas consumption in the Romanian market in the period 2015–2024 (GWh)

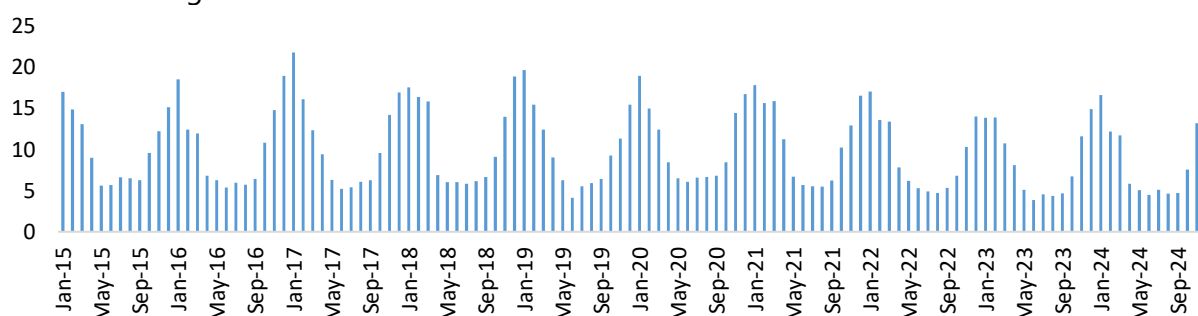
Source: ANRE reports

Natural gas consumption in Romania has decreased in recent years due to the decrease in consumption in the industrial sector (e.g. chemical industry), which has closed many production capacities.

5.1.2 Seasonal consumption and consumption peak

Depending on the season (winter, summer), natural gas consumption varies and the gas transmission network has to deal with different levels of transmission demand.

The seasonal variation of the gas consumption in the period 2015–2024 is represented in the following chart:



Source: ANRE reports

Chart 6- Seasonal gas consumption in the period 2015-2024 (TWh)

Key elements to ensure safety of gas supply in critical times have the historical gas consumption data of the **day** of the year with the **highest consumption** and of the **14 consecutive days with the highest consumption in the year**.

The history of the two key elements is as follows:

Maximum daily consumption and 14 days maximum consumption				
Year	Maximum consumption 1 day (GWh)	Date	Maximum consumption 14 days (GWh)	Period
2014	734,9	31 January	9.677,7	25 January-7 February
2015	647,5	9 January	8.393,3	1-14 January
2016	728,5	22 January	8.874,6	15-28 January
2017	751,1	9 January	10.145,2	7-20 January

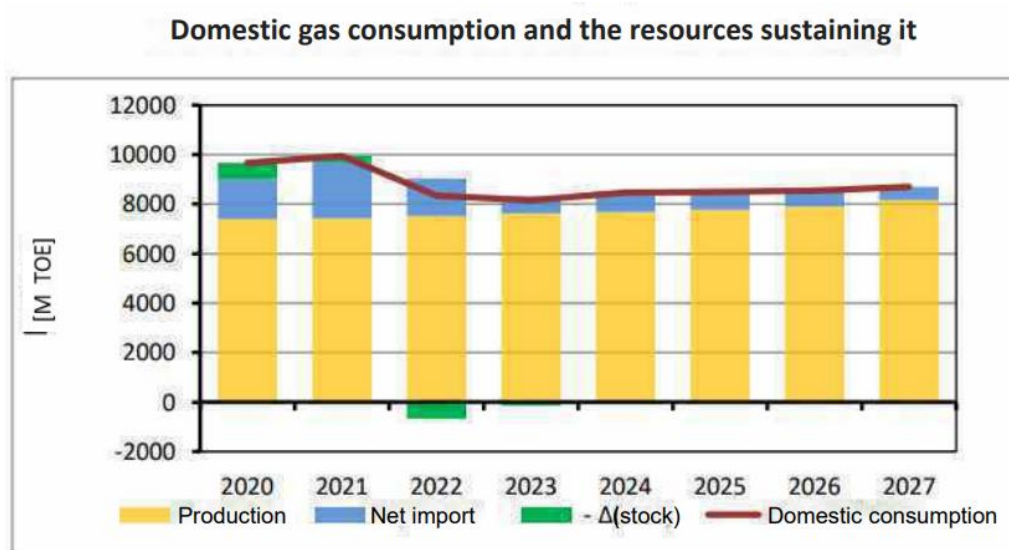
2018	718,2	01 martie	9.061,0	20 February – 5 March
2019	709,9	08 January	9.344,9	4-17 January
2020	690,8	08 January	8.864,4	7-20 January
2021	690,8	19 January	8.648,3	9-22 January
2022	643,3	26 January	8.292,3	14-27 January
2023	612,1	10 februarie	7.823,7	30 January -12 February
2024	618,4	10 January	8.020,6	10-23 January

Table 1 - PEAK and maximum consumption 14 days

5.1.3 Gas consumption forecasts

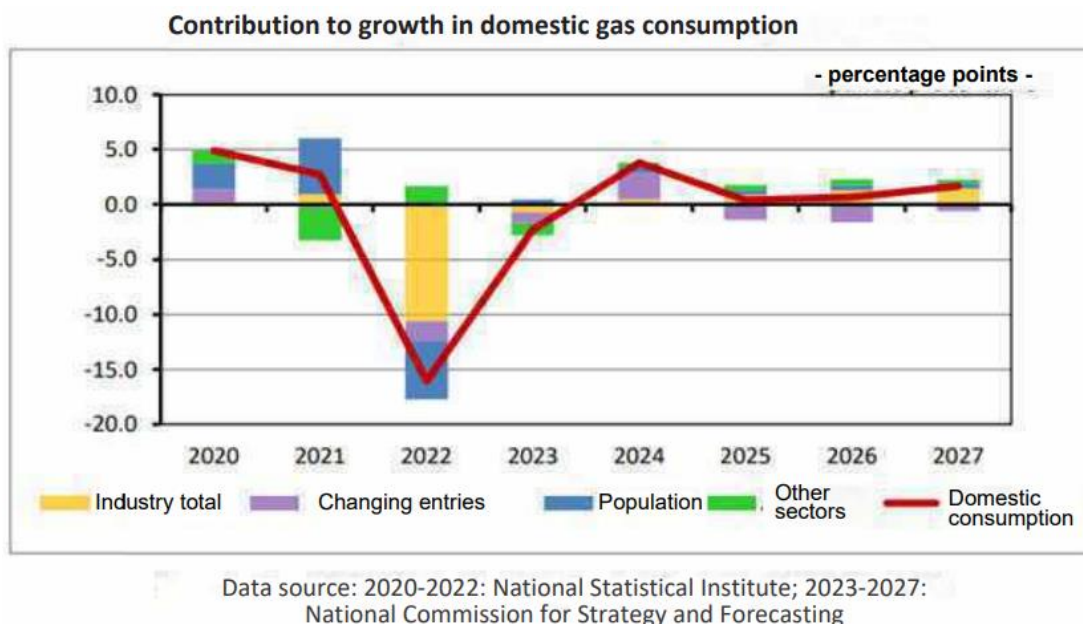
Romania's natural gas consumption will increase over the next 3-4 years due to the upgrading and commissioning of new power generation facilities: Iernut (430 MW), CET Mintia (1,700 MW), Işalnița and Turceni (1,325 MW), connections to the NTS under the Anghel Saligny program as well as the industry growth.

The decrease in domestic consumption in 2023 was 2.3% with an estimated resumption of growth of 3.8% in 2024, followed by an average annual growth rate of 0.9% between 2025 and 2027, with a more marked increase in the last forecast year.



Data source: 2020-2022: National Statistical Institute; 2023-2027: National Commission for Strategy and Forecasting

In conclusion, for the forecast period between 2025 to 2027, the most important contribution to consumption growth will be made by industry, as the major consuming branches (food, metallurgy, metal constructions) will intensify their advance.



5.2 Gas production

5.2.1 2015–2024 gas production history

The domestic gas production (TWh) in 2015–2024 by the main producers was as follows:

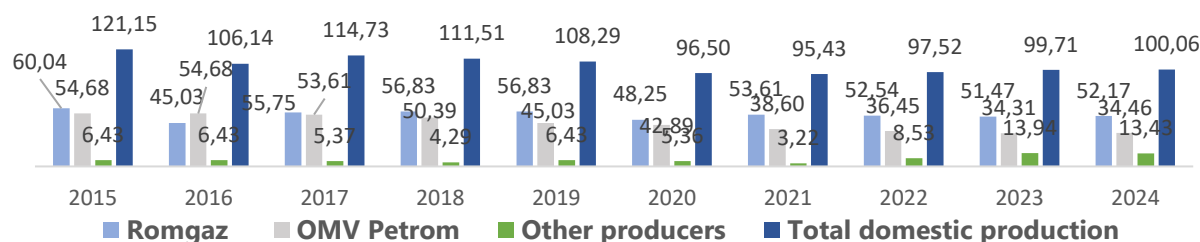


Chart 7 – The domestic gas production depending on the main producers between 2015-2024 (TWh/y)

Source: Internal – Dispatching Centre

The gas supply sources in 2015 – 2024, were as follows:

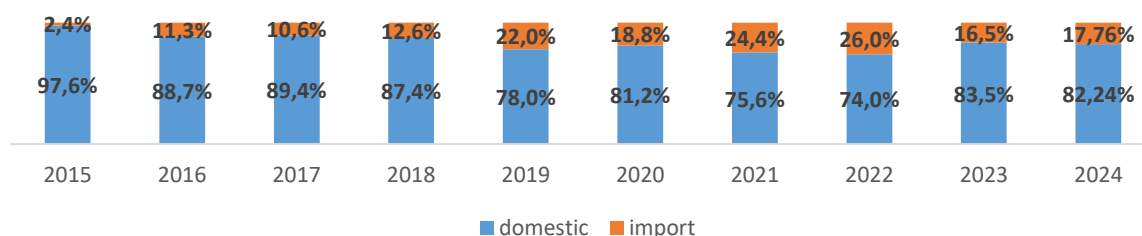


Chart 8 – The gas supply sources in the period 2015-2024

Source: Annual ANRE reports for the period 2015 –2024

Declining domestic production in the period 2015-2024 amid depletion of natural gas reserves has led to an increase in the annual share of natural gas imports from 2.4% in 2015 to 17.76% in 2024.

5.2.2 Forecast of the domestic gas production 2025-2033

For the preparation of the gas production forecasts the following were taken into account:

1. Forecasts from Romania's 2025-2035 Energy Strategy with the 2050 outlook

According to forecasts up to 2030 with the outlook for 2050, onshore natural gas production is expected to decrease, with the maintenance of a reduced dependence on imports thus being conditional on the exploitation of natural gas reserves discovered in the Black Sea.

The first natural gas from the Neptun Deep project, gas exploited by OMV Petrom and Romgaz in the Black Sea, will be extracted and transported through the Tuzla-Podișor pipeline from autumn 2027. The estimated annual gas volumes are about 8,16 bcm/y (87,6 TWh/y) entering the national natural gas transmission network from the Neptun Deep field.

In terms of gas-fired electricity generation, the net installed capacity at the beginning of 2024 was 2238 MW, up from 1988 MW in 2023, but very low compared to other European countries.

Efficient electricity natural gas-fired capacity has the prospect of a competitive position in the energy mix, thanks to its relatively low GHG and noxious emissions, flexibility and ability to be quickly adjusted. They are capable of providing system services and back-up for intermittent RES.

2. Forecasts of the main natural gas producers for the period 2025-2033

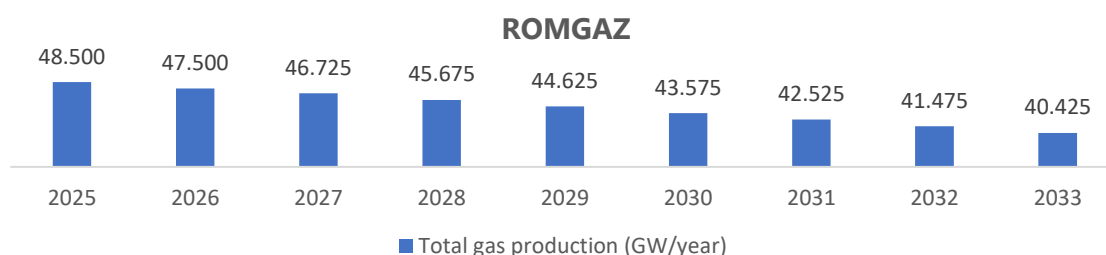


Chart 9 – ROMGAZ natural gas production forecast for the period 2025–2033

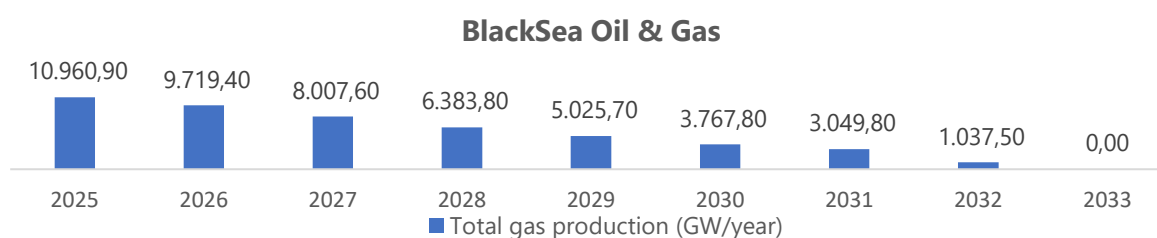


Chart 10 – Black Sea Oil and Gas natural gas production forecast for the period 2025–2033

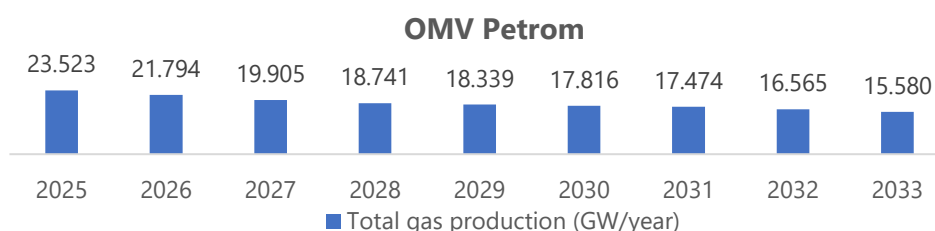


Chart 11 – OMV Petrom natural gas production forecast for the period 2025–2033

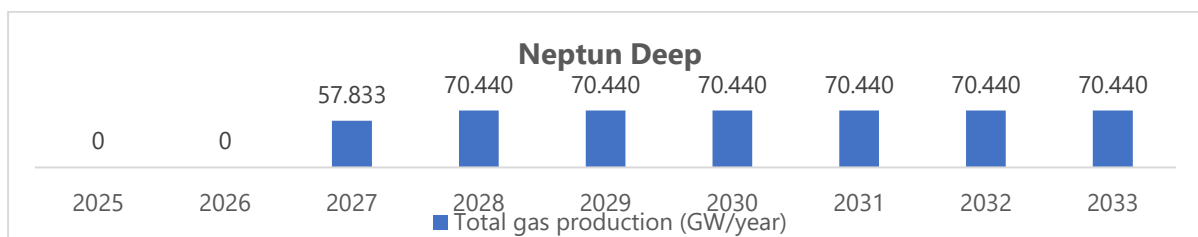


Chart 12 – Neptun Deep natural gas production forecast for the period 2025–2033

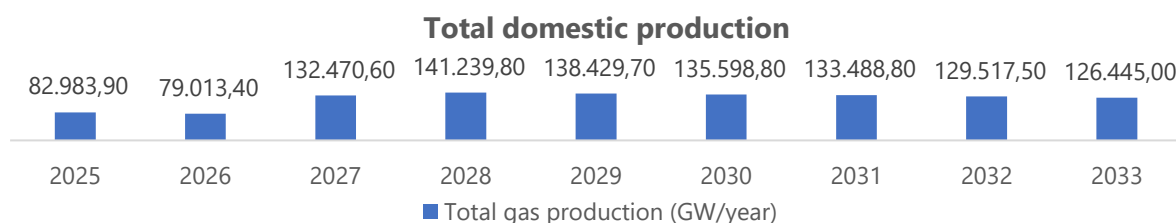


Chart 13– Natural gas production forecast 2025-2033 according to natural gas producers

Source: ROMGAZ, Black Sea Oil and Gas, OMV Petrom

5.3. Underground gas storage

5.3.1 Current context of the underground gas storage activity

The storage sector is of great importance to the European Union, to its security of energy supply and to the Union's other essential security interests. For the purposes of Council Directive 2008/114/EC underground gas storage facilities are considered to be critical infrastructure. The current European regulations on security of gas supply are geared towards cooperation between Member States in order to develop and agree on common measures to prevent and respond to security of supply risks and introduce the principle of solidarity in order to ensure the supply of gas to vulnerable consumers in crisis situations.

The objective of the European Commission is to ensure the necessary measures to guarantee the continuity of gas supply throughout the European Union, in particular for protected customers, in the event of difficult weather conditions or disruption of gas supply.

Climate and environmental challenges are the defining responsibility of our generation. The atmosphere is warming and the climate is changing more and more every year.

The European Green Deal proposes and sets out a new growth strategy, which aims to transform the EU into a fair and prosperous society with a modern, competitive and resource-efficient economy with zero net greenhouse gas emissions in 2050 and with economic growth decoupled from resource use. In this context, finding new ways of storing energy and developing and adapting to new, less polluting forms of energy production is a European challenge.

The use of methane gas will continue to play an important role in supporting the transition of the EU economy from solid fuel to green energy (energy from renewable sources). However, at EU level, in order to meet climate targets by 2050, methane will need to be composed of biomethane and synthetic methane.

At the national level, underground storage of natural gas plays a major role in ensuring security of natural gas supply, facilitating the balancing of consumption - domestic production - import of natural gas, by covering consumption peaks caused mainly by temperature variations, as well as maintaining the optimal operating characteristics of the National Natural Gas Transmission System, in order to obtain technical and economic advantages.

At the same time, underground gas storage has the strategic role of ensuring the supply of natural gas from storage in cases of force majeure.

The activity of underground storage of natural gas is an activity that can only be carried out by operators licensed by ANRE for this purpose, in accordance with the provisions of Law 123/2012 Law on Electricity and Natural Gas, as amended. Starting with the 2021 - 2022 storage cycle, the storage activity has been deregulated in line with national commitments on the liberalisation of the natural gas market.

Underground gas storage capacity is provided in Romania through 6 underground gas storage facilities with a total active capacity of 33.864 TWh per storage cycle, i.e. an injection capacity of 267,750 GWh/day and an extraction capacity of 341,440 GWh/day.

There are currently two storage system operators active in the Romanian storage market:

- Natural Gas Storage Subsidiary **DEPOGAZ Ploiesti SRL**, a subsidiary of SNGN Romgaz SA Mediaş, owning a license for the operation of five underground gas storage facilities having a total capacity of 30.709 TWh per cycle respectively 90, 7% of the total storage capacity and
- **Depomures**, which operates the underground gas storage facility in Târgu Mureş, with an active capacity of 3.155 TWh per storage cycle representing 9.3% of the total storage capacity.

Capacity of the underground storage facilities				
Underground storage facility	Storage operator	Active capacity	Withdrawal capacity	Injection capacity
		TWh/cyclu	GWh/day	GWh/day
Bălăceanca	Depogaz	0,535	12,840	10,700
Bilciureşti	Depogaz	14,017	149,800	107,000
Gherceşti	Depogaz	2,675	21,400	21,400
Sărmăşel	Depogaz	9,630	80,250	69,550
Urziceni	Depogaz	3,852	48,150	32,100
Târgu Mureş	Depomureş	3,155	29,000	27,000
Total		33,864	341,440	267,750

Source: Reporting: Depogaz and Depomureş

In terms of capacity booking history, the situation in the period 2014 - 2024 is described below:

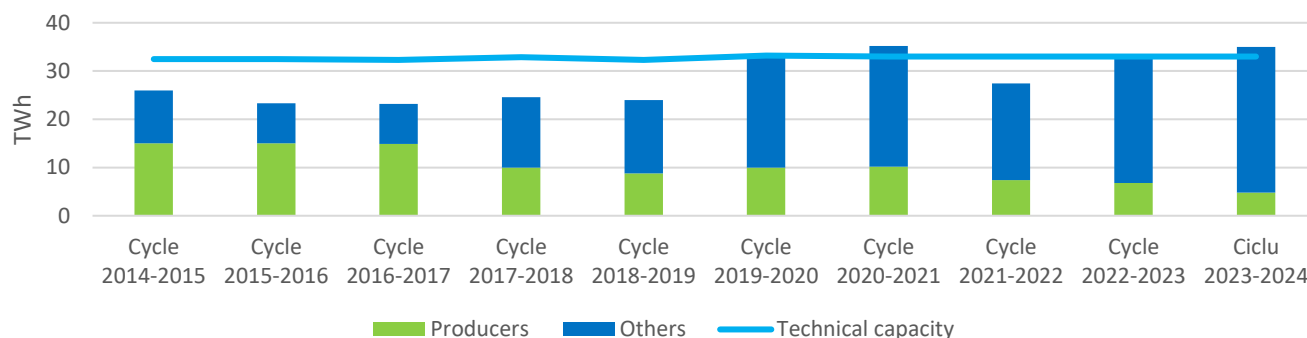


Chart 14 – Capacities booked in the period 2014-2024

Source: Depogaz

At national level, statistically over the last 5 years, the ratio of the volume of natural gas stored to annual consumption has been around 24.95%, in the middle of the European ranking.

During the winter period, the ratio of natural gas from storage to daily gas consumption is on average around 46%.

5.3.2 Forecasts for underground gas storage

In order to implement the European Green Deal, the EC Communication to the EU Parliament states that there is a need to rethink policies for clean energy supply across the economy, industry, production and consumption, large-scale infrastructure, transport, food and agriculture, construction, taxation and social benefits”.

The Commission considers that decarbonising the energy system is critical to reach climate objectives in 2030 and 2050. The production and use of energy across economic sectors account for more than 75% of the EU’s greenhouse gas emissions. Energy efficiency must be prioritised. A power sector must be developed that is based largely on renewable sources, complemented by the rapid phasing out of coal and decarbonising gas.

In the context of the energy transition, natural gas is a source of energy, which makes a rapid and effective contribution, through available and innovative technologies, to harnessing the potential for energy efficiency.

The contribution of the storage activity to ensuring the quantities of natural gas needed for annual consumption during this transitional period can be increased by increasing the technical performance of the storage facilities, an objective which can be achieved by ensuring the conditions for increasing the degree of filling of the storage facilities and by providing the technical possibilities for increasing the volumes of gas extracted daily during the extraction cycles.

In accordance with the Preventive Action Plan on measures to guarantee the security of natural gas supply in Romania (approved by GD 1077/2021), storage investment projects are promoted by SNGN Romgaz S.A., the Gas Storage Subsidiary DEPOGAZ Ploiești SRL, include the following actions:

- Investments in upgrades of storage facilities in order to increase the daily gas supply capacity;
- Increasing flexibility in using storage facilities in the injection and withdrawing cycles by promoting alternative operation solutions.

6. SECURITY OF GAS SUPPLY

Regulation (EU) 2017/1938 of 25 October 2017 concerning measures to safeguard the security of gas supply providing for the fulfilment of several objectives, as follows:

- The preparation by ENTSO-G of a simulation at EU level for the gas supply interruption situations in order to identify the main risks at EU level related to gas supply interruptions;
- The cooperation between Member States within the regional groups in order to evaluate common risks on the security of supply and to prepare and agree upon joint preventive and response measures;
- Introduction of the solidarity principle according to which Member States have to assist each other so as to permanently guarantee gas supply to vulnerable consumers even during the most severe crisis situations;
- Improving transparency: gas companies have to officially notify the national authority on long term contracts which may be relevant for security of supply;
- The setting of a relevant framework in which the decision on a bidirectional permanent flow takes into account the opinions of all EU countries for which that project brings benefits.

In order to meet the requirements of Regulation (EU) no. 2017/1938 of 25 October 2017, Art. 5, Transgaz shall demonstrate the fulfilment of all the necessary measures, so that, in case the main infrastructure is affected, the capacity of the remaining infrastructure, determined by the N-1 formula, may satisfy the gas demand necessary for the calculated area for one day of peak consumption demand (the peak daily consumption demand over the last 20 years).

The obligation to ensure that the remaining infrastructure has the capacity to satisfy the total gas demand mentioned above is considered to be observed and in the case that the competent authority proves in the preventive action plan that a supply disruption can be sufficiently compensated and in due time through proper measures based on market demand.

The following assumptions were considered for the calculation of the N-1 formula:

- the size of the market, classic consumption scenario;
- network configuration;
- local gas production;
- the forecasted capacity for the new interconnections;
- the forecasted capacity after the reverse flow optimisation.

The calculation of the N-1 formula for Romania

1. Definition of the N-1 formula

The N-1 formula describes the technical capacity of the gas transmission infrastructure to satisfy the total gas demand of the relevant area (Romania) in the case that the single main gas network is affected, for one day of exceptionally high demand, recorded statistically once every 20 years.

The gas infrastructure includes the gas transmission network, including interconnections, as well as the production facilities, LNG and storage facilities connected to the relevant area.

The technical capacity² of all the other gas infrastructures, available in the case that the single main gas infrastructure is affected, must be at least equal to the daily total gas demand for the relevant area, during one day of exceptional high gas demand, recorded statistically once every 20 years.

The result of the N-1 formula must be equal to at least 100%.

2. The calculation method for the N-1 formula:

$$N - 1[\%] = \frac{EP_m + P_m + S_m + LNG_m - I_m}{D_{max}} \times 100, N - 1 \geq 100\%$$

3. Definitions of the parameters of the N-1 formula

‘Relevant area’ means the geographical region for which the N-1 formula is calculated, as set by the competent authority. In this case, Romania - National Gas Transmission System (NTS).

Definitions regarding demand

‘D_{max}’: daily gas demand (in mil.cm/day) in Romania during a day with exceptionally high demand, statistically recorded once every 20 years.

Definitions regarding offer

‘EP_m’: the entry points technical capacity (mil. cm/day), other than production, LNG and storage facility entry points, symbolized by P_m, LNG_m, S_m, and meaning the sum of the technical capacities in all border entry points, capable of supplying Romania with gas;

‘P_m’: the maximum technical capacity for production (mil. cm/day) means the sum of the daily maximum technical production capacities of all the gas production facilities, that can be supplied at entry points in Romania;

‘S_m’: the maximum technical capacity for withdrawal (mil. cm/day) means the sum of the daily maximum capacities for withdrawals from all the storage facilities, that can be supplied to the Romanian entry points, taking account the physical properties of each of them;

‘LNG_m’: the maximum technical capacity of LNG facilities (mil. cm/day) means the sum of the maximum daily technical capacities for withdrawal from all the LNG facilities in Romania, taking into consideration critical elements, such as unloading, additional services, temporary storage and the regasification of LNG, as well as the technical capacity for extraction;

‘I_m’: means the technical capacity of the single main gas infrastructure (mil. cm/day), with the highest supply capacity for Romania.

If several infrastructures are connected to the same infrastructure upstream or downstream and cannot be operated separately, these are considered as a single gas infrastructure.

² According to Art. 2 (1) (19) of Regulation (EU) 2014/1789, ‘technical capacity’ means the maximum firm capacity that can be offered to the network users, taking account of system integrity and the operational requirements of the transmission system operator, or the distribution operator, or the hydrogen network operator, where applicable.

The result of the N-1 formula calculated for Romania in 2024 is as follows:

$$N - 1[\%] = \frac{45,0 + 24,05 + 32 + 0 - 18,8}{72} \times 100$$

$$N - 1[\%] = 114,9\%$$

$$N - 1[\%] \geq 100\%$$

Explanations regarding the used values

a) Terms regarding demand:

Terms regarding demand [mil. cm/day]		Explanations
D_{max}	72,0	In the beginning of 2024 the peak consumption ensured through the NTS amounted to 55,2 million S m ³ /day on gas day 10.01.2024, which was lower than the peak consumption statistically existing once every 20 years.

b) Terms regarding offer (capacity):

Terms regarding offer [mil. cm/day]		Explanations
EP_m	45,0	The total capacity of import points (Isaccea 1, Negru Vodă 1, Csanadpalota, Ruse-Giurgiu, Ungheni).
P_m	24,05	Domestic gas production entered into the NTS
S_m	32	The sum of the maximum potential flow rates to be extracted from each storage facility under conditions of 100% loading
LNG_m	0	There are no LNG terminals.
I_m	18,8	The import capacity at Isaccea 1 (from Ukraine).

For P_m it was considered the production potential and not the technical capacity (64,3 million Scm/day as at 31.12.2024). We consider that this approach ensures a correct image provided by the N-1 standard; the technical capacity mentioned can no longer be achieved due to the decreasing of domestic production.

Upon the determination of the S_m the maximum potential flows that can be extracted from the 6 romanian underground storage facilities under conditions of 100% loading was taken into consideration.

	Commercial technical capacity (mil Sm ³ /day)	Maximum potential flow (mil Sm ³ /day)
Depogaz Ploiești SRL	32.7	29.2
Depomureș S.A. Tg. Mures	3.0	2.8
Total	35,7	32,0
<i>Maximum daily flow withdrawn simultaneously from all the storage facilities (22.01.2024)</i>	<i>26,7</i>	

At EP_m value determination, the Isaccea 1, Negru Vodă 1, Csanadpalota and Giurgiu-Ruse and Ungheni entry points were considered as follows:

Entry points	Entry point capacity (mil. Scm/day)
Isaccea 1 entry point	18,8
Negru Voda 1 entry point	14,5
Csanadpalota entry point	7,2
Ruse –Giurgiu entry point	2,5
Ungheni entry point	2,0
Total	45

Table 2 - Gas import points

4. The calculation of the N-1 formula by taking into account the demand oriented measures:

$$N - 1[\%] = \frac{EP_m + P_m + S_m + LNG_m - I_m}{D_{max} - D_{eff}} \times 100, N - 1 \geq 100\%$$

Definition related to demand:

`D<sub>eff</sub>` means the part of (in million cm per day) of D_{max} which, in case of gas supply disruption, may be covered to a sufficient extent and in due time by market measures focused on demand, in line with Art. 9 (1) (c) and Art. 5 (2).

The calculation result is the same as: D_{eff}=0 – no contracts are concluded with interruptible safety clients

Note:

- This document is an evaluation made by SNTGN TRANSGAZ SA;
- The official calculation of the N-1 formula is the exclusive task of the Competent Authority assigned for applying Regulation (EU) 2017 /1938 of 25 October 2017 on measures guaranteeing the security of gas supply.

Forecast of the value of the N-1 formula for the partial Russian gas supply interruptions (through Isaccea):

YEAR	N-1
2025	111,8
2026	110,4
2027	163,5
2028	155,1
2029	154,2
2030	157,9
2031	157,2
2032	158,7
2033	157,8

Table 3– Forecasts for the N-1 value for 2025-2033

7. DEVELOPMENT PATHS FOR THE NATIONAL GAS TRANSMISSION SYSTEM (NTS)

I. STRATEGIC PROJECTS

The Development Plan for the Romanian National Gas Transmission System consists of large-scale projects meant to reconfigure the gas transmission network, which, although extended and complex, was designed at a time when the main goal was to supply gas to large industrial consumers and to provide them with access to the resources concentrated in the middle of the country and in Oltenia.

The identification of the projects that need to be developed regarding the National Transmission System (NTS) was based on the main requirements the system has to meet under the present dynamics of the regional gas market. Taking into account the latest evolutions and trends in the European gas transmission routes, two important sources for gas supply are clearly emerging: **Caspian** and **Black Sea gas**.

Therefore, the projects planned by the company aim at:

- ensuring a proper interconnectivity with the neighbouring countries;
- creating regional gas transmission routes to ensure gas transmission from new supply sources;
- creating the necessary infrastructure for taking over and transmitting offshore blocks gas to the Romanian market and other markets in the region;
- extending the gas transmission infrastructure to improve gas supply to deficient areas;
- creating the single integrated European market.

In this context, it is very important for Transgaz to implement the described projects on a short notice, in order to connect the Central European markets to the Caspian and Black Sea resources.

The geostrategic position, the primary energy resources, the major investment projects in gas transmission infrastructure can support Romania's becoming a key player in the region, provided it keeps pace with the technological progress and succeeds in obtaining the necessary financing. By the envisaged projects for the upgrading and development of the gas transmission infrastructure, by the smart network control, automation, communication and management system implementation, Transgaz intends to **maximize energy efficiency** on the entire chain of activities and to **create** an efficient, reliable and flexible **smart gas transmission system**.

The **`smart energy transmission system`** concept applicable to the **`smart gas transmission systems`** will enhance network management which will also deal with smart tool safety and use issues regarding pressure, flow, metering, in-line inspection, odorization, cathodic protection, traceability, enhancing the system's operating flexibility, safety and integrity, generating the energy efficiency increase.

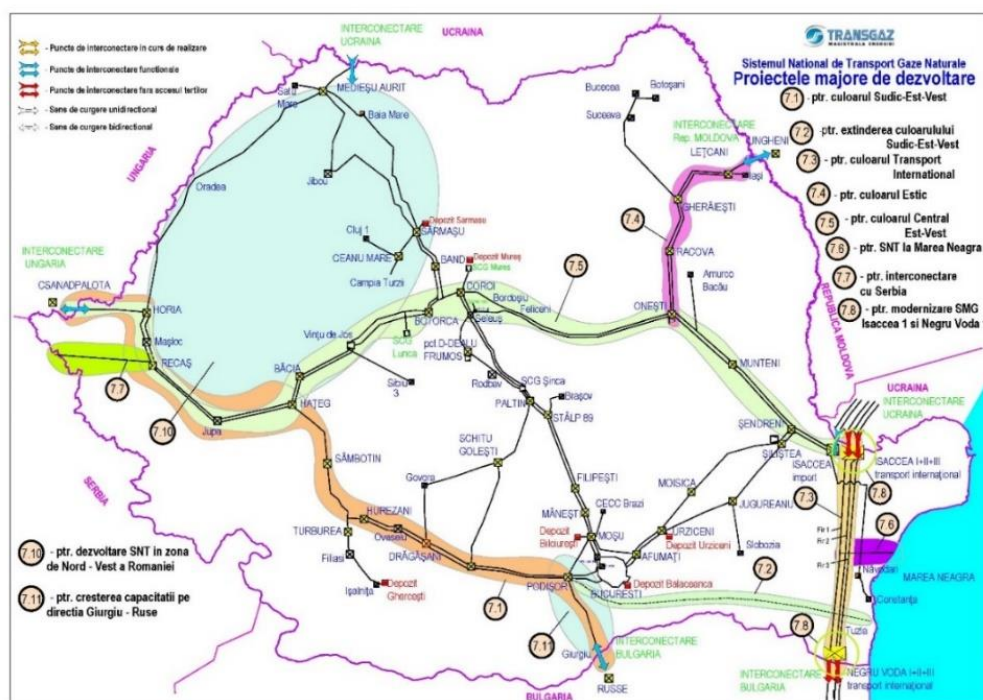
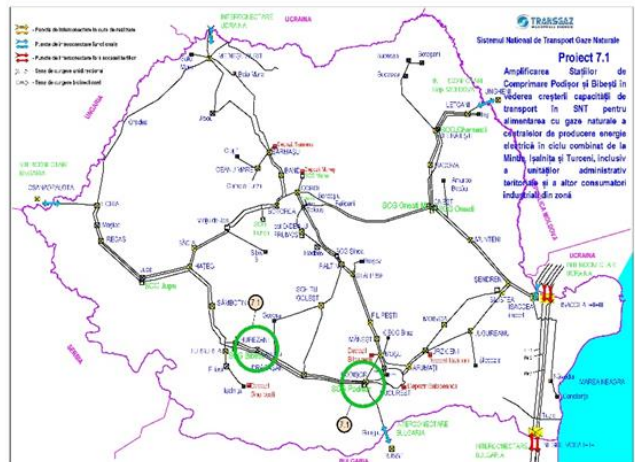


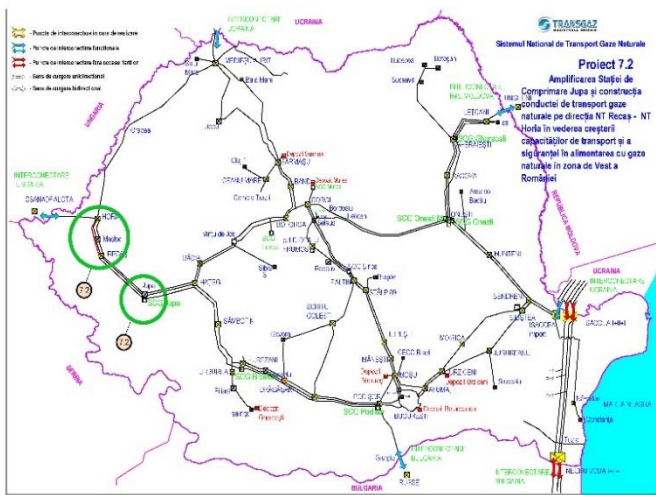
Figure 5 - Major NTS projects map

7.1 Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area

Project name:	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area
Project number:	7.1
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Increasing gas transmission capacity Ensuring security of gas supply
Estimated completion date	2026
Project Objective:	The expansion of the compressor stations of Podișor and Bibești will ensure a constant gas supply for the Mintia, Ișalnița and Turceni power plants, as well as for other industrial facilities and Territorial Administrative Units, thus increasing the reliability of the region's energy system. The project will increase the gas capacity and pressure in order to ensure a constant and stable gas flow to industrial customers and power plants, and it will support the industrial development of the region by ensuring a constant gas flow, contributing to energy stability and increasing industrial competitiveness.

	At the same time, by implementing the investment for the expansion of the Podișor Compressor Station (TCS Podișor) and the Bibești Compressor Station (TCS Bibești), the aim is not only to improve transmission capacities and ensure a more secure and efficient energy system, but also to support the transition to cleaner energy, promote economic development and strengthen regional interconnectivity. These general objectives are fundamental to supporting sustainable growth and to meet the demands of the ever-changing energy market.
Project description:	The project "Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area" involves the expansion of the existing Podișor and Bibești Gas Compressor Stations (CS), by installing in each one a new compressor in a room, as well as a gas filtering-separation system and a compressed gas cooling system, in order to increase the NTS' transmission capacity for gas supply to the Mintia combined cycle power plant and the Ișalnița and Turceni combined cycle power plants, including consumers in their area. No additional land areas beyond the existing Podișor CS and Bibești CS enclosure are needed, all the works will be carried out inside the station. 
Project justification:	Considering the provisions of the European Strategy for Energy Union and the actions for implementing the aims of this strategy (competitiveness, sustainability and security of energy supply), Romania pays great attention to ensure energy security, develop energy infrastructure by diversifying energy sources and transmission routes, and ensure the efficient functioning of the energy market.
Connection with other projects:	-
Economic data:	Estimated value of the project is 55.54 million Euro
Impact on cross-border capacity:	-
The project stage:	The pre-feasibility study is completed.
TYNDP:	PCI status:
The investment project was declared a project of national importance in the gas sector by GD 759/18.09.2025.	

7.2 Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania

Project name:	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania
Project number:	7.2
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Increasing gas transmission capacity Ensuring security of gas supply
Estimated completion date	2027
Project Objective:	The expansion of the Jupa compressor station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction will ensure the circulation of additional volumes and pressures needed in the system to supply consumers in the western part of the country, balance the gas transmission system in the western part of the country, increase the security of gas transmission to the Central European markets and the possibility of further development of the gas transmission/supply network in the region. At the same time, by the implementation of the investment for the expansion of the Jupa Compressor Station (TCS Jupa) and the construction of the natural gas transmission pipeline in the direction of TN Recaș-TN Horia, the aim is not only to improve transmission capacities and ensure a more secure and efficient energy system, but also to support the transition to cleaner energy, promote economic development and strengthen regional interconnectivity. These general objectives are fundamental to supporting sustainable growth and to meet the demands of the ever-changing energy market.
Project description:	The project "Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania" involves the expansion of the existing Jupa Gas Compressor Station (CS), by installing a new compressor in a room, as well as a gas filtering-separation system and a compressed gas cooling system, and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to ensure the increase of transmission capacities as well as to increase the security of gas supply in the Western part of the country. No additional land areas beyond the existing Jupa CS enclosure are needed, all the works will be carried out inside the station. 
Project justification:	Considering the provisions of the European Strategy for Energy Union and the actions for implementing the aims of this strategy (competitiveness, sustainability and security of energy supply), Romania pays great attention to ensure energy security, develop energy infrastructure by diversifying energy

	sources and transmission routes, and ensure the efficient functioning of the energy market.
Connection with other projects:	-
Economic data:	Estimated value of the project is 100.21 million Euro
Impact on cross-border capacity:	-
The project stage:	The pre-feasibility study is completed.
TYNDP:	PCI status:
The investment project was declared a project of national importance in the gas sector by GD 759/18.09.2025.	

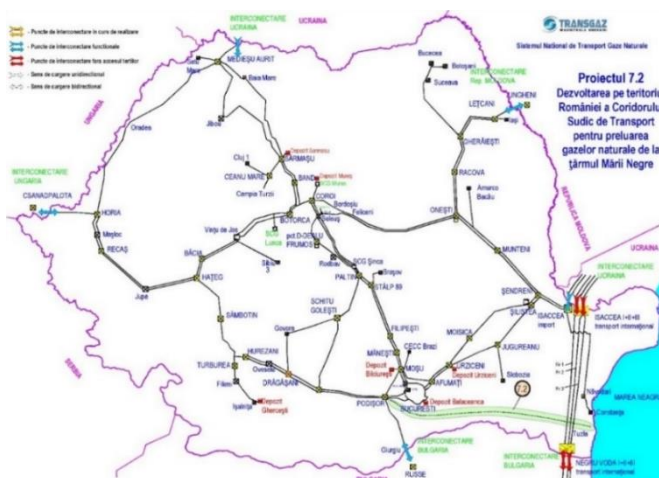
7.3 Development on the Romanian territory of the Transmission Corridor for taking over the Black Sea gas (Tuzla – Podișor)

Project name:	Development on the Romanian territory of the Transmission Corridor for taking over the Black Sea gas (Tuzla – Podișor)
Project number:	7.3
Project beneficiary:	SNTGN Transgaz SA 
Type of project:	Capacity increase
Estimated completion deadline	2025
Scope of the project:	Construction of a natural gas transmission pipeline Tuzla-Podișor, with a length of 308.3 km and DN 1200 respectively DN 1000, connecting the natural gas resources available on the Black Sea coast to the BRUA corridor, thus ensuring the possibility to transport natural gas to Bulgaria and Hungary through the existing interconnections Giurgiu-Ruse (with Bulgaria) and Nădlac- Szeged (with Hungary). This pipeline will interconnect with the T1 natural gas transmission pipeline and crosses the counties: Constanta, Calarasi and Giurgiu.

Description of the project:

The pipeline consists of two sections as follows:

- section I, Tuzla–Amzacea, 32,4 km long, Ø 48" diameter (DN1200) and technical capacity of 12 bcma;
- section II, Amzacea–Podișor, 275,9 km long, Ø40" diameter (DN1000) and technical capacity of 6 bcma.



Project justification:	As Europe becomes increasingly dependent on natural gas imports, access to new sources is becoming an urgent necessity. This investment will allow gas from the Black Sea to enter the NTS and thus reach economic operators and households in the localities connected to the system. Moreover, this pipeline will connect to new sources of natural gas in the Transbalkan Corridor and the Vertical Corridor, of which the BRUA pipeline is a part, and will also be necessary for gas trasnmission coming to Romania from the Caspian Sea area, from LNG terminals in Turkey and Greece.						
Connection with other projects:	BRUA - Development on the Romanian territory of the National Gas Transmission System on the Bulgaria – Romania – Hungary – Austria Corridor (BRUA) - phase I– completed project						
Economic data:	The estimated value of the project is Euro 493.9 million of which 85.5 million Euro was obtained from the Modernisation Fund.						
Impact on cross-border capacity:	Phased capacity increase of the bi-directional Bulgaria-Romania-Hungary-Austria transmission corridor which currently provides 2.63 bcm/year of transmission capacity with Hungary. Three levels of capacity development with Hungary are proposed in the incremental capacity process, respectively at 2.98 bcm/year, 4.38 bcm/year and 5.32 bcm/year, for the transmission of gas from the Vertical Corridor.						
Project phase:	In progress						
TYNDP: TRA-A-362				PCI status: YES – list V			
Project amendments:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Description of the project	285 km	307 km	308,2 km	308,3 km	308,3 km	308,3 km	308,3 km
Estimated completion deadline	2019	2020	2020	2021	2022	2025	2025
Total estimated value of the project (million euro)	262,4	278,3	360,4	360,4	371,6	371,6	493.9

7.4 Expansion of the National Gas Transmission System, part of the Vertical Corridor

Project name:	Expansion of the National Gas Transmission System, part of the Vertical Corridor
Project number:	7.4
Project beneficiary:	SNTGN Transgaz SA 
Type of project:	Transmission capacity increase
Estimated completion deadline	2028 - 2029

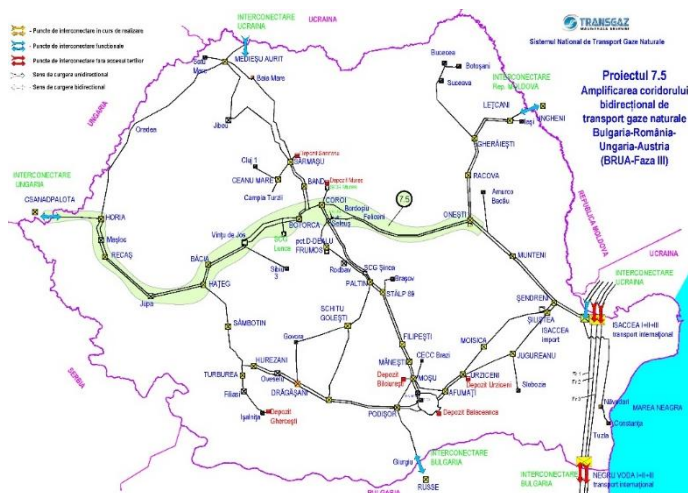
Scope of the project:

Phased increase in transmission capacity to ensure the capacity levels proposed in the incremental capacity process, i.e. 4.38 bcm/year and 5.32 bcm/year, for gas transmission on the Vertical Corridor.

Project description:

The development of this natural gas transmission corridor involves the following:

- upgrading of existing pipelines belonging to the NTS;
- replacement of existing pipelines belonging to the NTS with new pipelines or construction of new pipelines installed in parallel with existing pipelines;
- development of 4 or 5 new compressor stations with a total installed capacity of approx. 66-82.5 MW;
- increasing natural gas transmission capacity to Hungary.



Project justification:

Phased increase in transmission capacity to ensure the capacity levels proposed in the incremental capacity process, i.e. 4.38 bcm/year and 5.32 bcm/year, for gas transmission on the Vertical Corridor.

Connection with other projects:

Vertical corridor

Economic data:

The estimated value of the project is **Euro 800 million**

Impact on cross-border capacity:

Capacity increase to ensure the capacity levels proposed in the incremental capacity process, i.e. 4.38 bcm/year and 5.32 bcm/year, to transport gas from the Vertical Corridor.

Project phase:

Updated pre-feasibility study.

TYNDP: TRA-N-959

PCI status: NO

Project amendments:

	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024	TYNDP 2024 revised
Estimated completion deadline	-	2023	2023	2025	2025	2027	2028-2029	2028-2029
Total estimated value of the project (million euro)	-	530	530	530	530	530	855	800

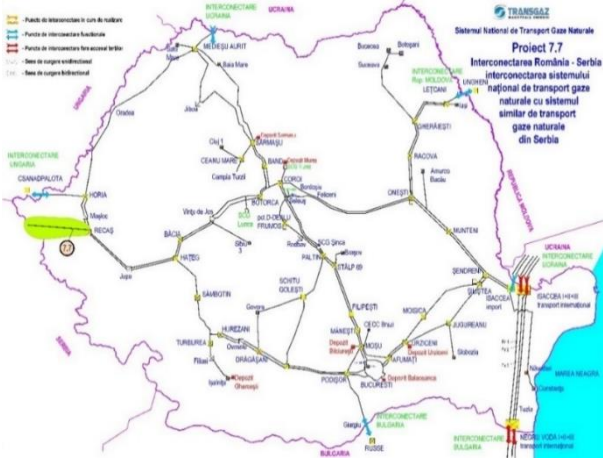
7.5 Romania – Serbia Interconnection – interconnection of the national gas transmission system with the similar gas transmission system in Serbia

Project name:

Romania – Serbia Interconnection – interconnection of the national gas transmission system with the similar gas transmission system in Serbia

Project number:

7.5

Project beneficiary:	SNTGN Transgaz SA						
Type of project:	Increasing security of gas supply, gas market integration						
Estimated completion deadline	2028						
Scope of the project:	Increasing the degree of interconnectivity between natural gas transmission systems in EU Member States and increasing energy security in the region						
Description of the project:							
The project will consist in the following:							
- construction of a new interconnection pipeline on the Recaş-Mokrin direction of approx. 97 km in length of which approx. 85 km on the territory of Romania and 12 km on the territory of Serbia with the following characteristics: - pressure in the BRUA pipeline Recaş area: 50-54 bar (PN BRUA-63 bar); - diameter of the interconnection pipeline: DN 600, PN 63 bar; - transmission capacity: max. 1.2 bn Scm/year (137,000 Scm/h), both on the Romania-Serbia and Serbia-Romania direction. - construction of a natural gas metering station (located on the territory of Romania).							
							
Project justification:	In the context of the provisions of the European Strategy on Energy Union and the actions to implement the objectives of this strategy (competitiveness, sustainability and security of energy supply), Romania is particularly interested in ensuring the energy security dimension, developing energy infrastructure by diversifying energy sources and transmission routes, strengthening solidarity between Member States and ensuring the efficient functioning of the energy market.						
Connection with other projects:	BRUA						
Economic data:	The estimated value of the project is Euro 86,8 million						
Impact on cross-border capacity:	Transmission capacity: max. 1.2 bn Scm/year (137,000 Scm/h), both in the direction Romania-Serbia and Serbia-Romania.						
Project phase:	FEED - completed						
TYNDP: TRA-A-1268			PCI status: NO				
Project amendments:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion deadline	-	2026	2020	2021	2021	2028	2028
Total estimated value of the project (million euro)	-	43	42,4	53,76	56,21	56,21	86,8

7.6 Development/Upgrading of the gas transmission infrastructure in the North-Western part of Romania

Project name:	Development/Upgrading of the gas transmission infrastructure in the North-Western part of Romania
Project number:	7.6
Project beneficiary:	SNTGN Transgaz SA 
Type of project:	Increasing natural gas transmission capacity Ensuring security of gas supply in the region
Estimated completion deadline	2027 for Stage 1 2028 for Stage 2 2029 for Stage 3
Scope of the project:	Development/upgrading of objectives related to the National Transmission System, in the North-West area of Romania, in order to create new natural gas transmission capacities or to increase existing capacities.
Description of the project: Given the scale of this project, it is proposed to implement it in stages as follows: ▪ Stage 1: ○ construction of the natural gas transmission pipeline and related installations in the Horia-Borş direction. ▪ Stage 2: ○ construction of the natural gas transmission pipeline and related installations in the direction Borş-Abrămuţ; ○ construction of a Gas Compressor Station at Medieşu Aurit; ○ construction of the gas transmission pipeline and related installations in the direction Huedin-Aleşd. ▪ Stage 3: ○ construction of the gas transmission pipeline and related installations in the direction Abrămuţ-Medieşu Aurit; ○ construction of the gas transmission pipeline and related installations in the direction of Sărmăşel-Medieşu Aurit.	
Project justification:	In the context of the provisions of the European Strategy on Energy Union and the actions to implement the objectives of this strategy (competitiveness, sustainability and security of energy supply), Romania attaches particular interest to ensuring the energy security dimension, developing energy infrastructure by diversifying energy sources and transmission routes, strengthening solidarity between Member States and ensuring the efficient operation of the energy market.
Connection with other projects:	-
Economic data:	The estimated value of the project is Euro 405 million



Impact on cross-border capacity:	-						
Project phase:	The Prefeasibility Study is finalised.						
TYNDP: TRA-N-598		PCI status: -					
Project amendments:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion deadline	-	-	-	2026	2026	2026	2028
Total estimated value of the project (million euro)	-	-	-	405	405	405	405

7.7 Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction

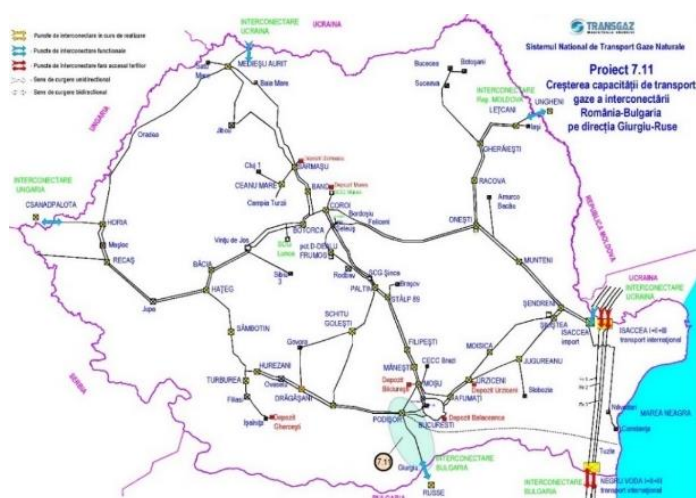
Project name:	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction
Project number:	7.7
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Ensuring energy security Diversification of natural gas transmission sources and routes
Estimated completion date	2027
Project Objective:	In line with the provisions of the Memorandum of Cooperation for the implementation of the Vertical Corridor to achieve the goal, the parties agree to explore technical needs in the form of new pipelines, interconnections or reinforcements of national transmission systems.

Project description:

Depending on capacities, the project consists of:

- construction of a new natural gas pipeline and related facilities;
- construction of a new Danube undercrossing;
- amplification of GMS Giurgiu.

The Prefeasibility Study considered several development options for an increase in capacity from 1.5 bcm/year to 5 bcm/year.



Project justification:	In the context of the provisions of the European Strategy on Energy Union and the actions to implement the objectives of this strategy (competitiveness, sustainability and security of energy supply), Romania is particularly interested in ensuring energy security, developing energy infrastructure by diversifying energy sources and transmission routes, strengthening solidarity between Member States and ensuring the efficient functioning of the energy market.						
Connecting with other projects:	BRUA						
Economic data:	The estimated value of the project is euro 51.8 million						
Impact on cross-border capacity:	Increasing capacity to Bulgaria from 1.5 bcm/year to 5 bcm/year.						
Project Stage:	Prefeasibility Study - completed.						
TYNDP:		PCI status:-					
Project amendments:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion deadline	-	-	-	2027	2027	2027	2027
Total estimated amount of the project (mil. Euro)	-	-	-	51,8	51,8	51,8	51,8

7.8 Eastring-Romania

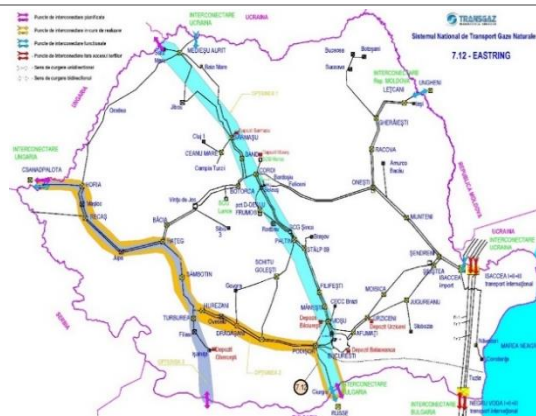
Project name:	Eastring-Romania
Project number:	7.8
Project beneficiary:	SNTGN Transgaz SA
Project type:	Increasing transmission capacity and ensuring security of gas supply across the region
Estimated completion date	2028 for Stage 1 2033 for Stage 2
Project Objective:	Connecting the natural gas transmission systems of Slovakia, Hungary, Romania and Bulgaria to gain access to natural gas reserves in the Caspian region and the Middle East.

Project description:

The EASTRING project, promoted by EUSTREAM, is a bi-directional flow pipeline for Central and South-Eastern Europe that aims to connect the natural gas transmission systems of Slovakia, Hungary, Romania and Bulgaria to gain access to natural gas reserves in the Caspian region and the Middle East.

According to the feasibility study, the project will be implemented in two phases as follows:

- Phase 1 - Maximum capacity of 20 bcm/year;
- Phase 2 - Maximum capacity of 40 bcm/year.



Project justification:	EASTRING will provide the most cost-effective, direct transmission route between gas hubs in the western European Union and the Balkan region/Western Turkey, an area with a very high potential to deliver gas from different sources. By being able to diversify transmission routes as well as supply sources, it will ensure security of supply in the whole region, mainly in South-East European countries.						
Connecting with other projects:	It connects Slovakia with the EU's external border via Bulgaria, Hungary and Romania.						
Technical data:	Bi-directional flow interconnection pipeline with an annual capacity between 225,500 GWh and 451,000 GWh (approx. 20 bcm to 40 bcm), connecting Slovakia to the EU external border via Bulgaria, Hungary and Romania.						
Economic data:	Estimated value of the investment - Phase 1 - Euro 1,297 million for Romania (Euro 2,600 million -total); - Phase 2 - Euro 357 million for Romania (Euro 739 million total).						
The impact on cross-border capacity:	- Phase 1 - Maximum capacity of 20 bcm/year; - Phase 2 - Maximum capacity of 40 bcm/year.						
The project stage:	Feasibility study - completed						
TYNDP: TRA-A-655		PCI status: YES– list V					
Project amendments:							
	PDSNT 2014	PDSNT 2017	PDSNT 2018	PDSNT 2019	PDSNT 2020	PDSNT 2022	PDSNT 2024
Estimated completion deadline	-	-	-	2028	2029	2030	2033
Total estimated project amount (mill. euro)	-	-	-	1.654	1.654	1.654	1.654

7.9 Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System

Project name:	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System
Project number:	7.9
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Intelligent network implementation for remote monitoring and control.
Estimated completion date	2027
Project Objective:	Reducing corrosion of pipelines, keeping them in operation for as long as possible and reducing maintenance costs is a major objective.

	The implementation of the acquisition, control and monitoring system for the cathodic protection system will ensure increased sustainability and safety in the operation of transmission pipelines. The acquired data will ensure simplicity of operation for a complex pipeline protection system with low maintenance costs.						
Project description:							
The centralised cathodic protection system will offer the possibility of clear and precise remote setting, monitoring and operation of system points of interest, eliminate data reading costs, avoid situations where due to weather conditions it is not possible to read data and human errors, will allow distributed control of locations, will reduce operation and maintenance costs, considerably reduce setup time. Implementing such a system will reduce micro-management, testing and commissioning times. The distributed architecture will provide minimal downtime risks and provide maximum reliability of the cathodic protection system. The system will be intuitive, easy to use and acceptable in any SCADA system structure, and operator training requirements are short and simple. Implementing such a system will reduce staff costs and specialise operations and maintenance staff.							
Project justification:		Remote control of cathodic protection station parameters and corrosion monitoring at critical points of the natural gas transmission system is mandatory to reduce corrosion and properly manage energy consumption at each location. At the same time the system will provide information related to the electrosecurity of the pipeline, as well as for inner cathodic protection, providing information at some points or sections for limiting rectification of AC leakage currents induced in the pipeline.					
Economic data:		Estimated value of the investment Euro 17,7 million					
The project stage:		Feasibility study - completed					
TYNDP: -			PCI status:-				
Project changes:							
	PDSNT 2014	PDSNT 2017	PDSNT 2018	PDSNT 2019	PDSNT 2020	PDSNT 2022	PDSNT 2024
Estimated completion deadline	-	-	-	2023	2023	2027	2027
Total estimated value of the project (euro million)	-	-	-	8	8	17,7	17,7

7.10 Development of the SCADA system for the National Gas Transmission System

Project name:	Development of the SCADA system for the National Natural Gas Transmission System
Project number:	7.10
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Intelligent network implementation for remote monitoring and control.

Estimated completion date	2026
Project Objective:	The upgrading of the natural gas transmission infrastructure must be supported in the coming years by the development of an efficient and flexible SCADA system, by upgrading the hardware and software architecture, by migrating to a decentralized architecture, with distributed control on administrative organizational units in accordance with the structure of SNTGN TRANSGAZ SA.
Project description: The project on "SCADA (Supervisory Control And Data Acquisition) System Development for the National Natural Gas Transmission System" will consist of: ▪ the analysis of the possibilities to optimise the SCADA system architecture; ▪ the replacement/upgrade of morally and physically obsolete hardware equipment in national/territorial SCADA dispatchers in order to ensure, through the new firmware/operating systems/software applications used, an increase in the volume and power of data processing as well as in the level of IT security; ▪ ensuring a reserve of hardware/software capacity at the level of national and regional SCADA dispatchers necessary for the future integration into the SCADA system of NTS facilities to be commissioned in the period 2022-2027; ▪ additional integration of about 170 operational MRSs (Metering Regulating Stations) in the National Natural Gas Transmission System (NTS); ▪ ensuring the continuity of transmission, real-time monitoring at national and regional SCADA dispatchers, of the relevant and necessary technological parameters within the NTS objectives, in accordance with the level and pace of development of technological installations in the short and medium term, in order to monitor and operate the NTS in conditions of safety, efficiency and environmental protection; the integration of the new local automations to be put into operation by 2022 resulting from the upgrading/development of natural gas compression stations, technological nodes, shut-off valves located on main pipelines, etc; ▪ installation of SCADA-type systems Intrusion Detection System LAN SCADA; ▪ the installation of dedicated IP&DS type systems with supervision at industrial protocol level for sensitive applications-stations remotely controlled by SCADA system: technological nodes; interconnection stations; compressor stations; future Pipeline Automation Systems. ▪ the installation of a simulation system and PMS (Pipeline Monitoring Software) or NSM (Network Program Management); ▪ the identification and provision of technical solutions for securing the industrial data network where data acquisition and control systems (SCADA) are installed; ▪ the analysis of technical opportunities for the design and implementation of an emergency dispatch, if the study on the opportunity and necessity of an emergency dispatch calls for it, the training of SCADA operator/technical/maintenance staff in the use of the new security techniques and policies implemented. For the implementation of the project "Development of TRANSGAZ SCADA System for the National Transmission System", taking into account the conclusions of the feasibility study it was proposed to develop the project in stages: Stage 1 - upgrading the central hardware and software infrastructure - servers and SCADA operator stations.	

Stage 2 - Equipping new MRSs for SCADA monitoring.

Stage 3 - Implementation of interconnection, control and monitoring projects with other TRANSGAZ SCADA systems.

Project justification:	The National Natural Gas Transmission System has a continuous evolution justified by the dynamics of gas flows and the strategic position of Romania in terms of ensuring national and European energy independence and security.
Economic data:	Estimated value of the investment EUR 5.5 million
The project stage:	Feasibility study - completed. Stage 1- in procurement
TYNDP:	PCI status: -

Project changes:

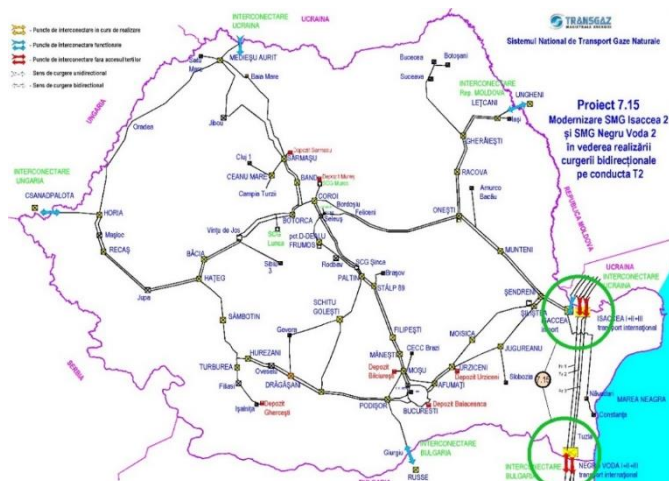
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated time of completion	-	-	-	2023	2023	2025	2026
Total estimated value of the project (€ million)	-	-	-	5,5	5,5	5,5	5,5

7.11 Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline

Project name:	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline
Project number:	7.11
Project beneficiary:	SNTGN Transgaz SA 
Project type:	The security of supply, Energy security
Estimated completion date	2028 <i>The project will be developed according to the results of the market demand assessment for incremental capacity for the interconnection points located on the T2 and T3 pipelines on the Bulgaria - Romania - Ukraine transmission direction (Transbalkan corridor).</i>
Project Objective:	Ensuring bi-directional flow at the border with Ukraine and Bulgaria on the T2 transit pipeline requires the upgrading of the natural gas metering stations GMS Isaccea 2 and GMS Negru Voda 2.
Project description:	

Upgraded Isaccea 2 Metering Station will be equipped with separation/filtration plant and metering plant:

- the separation/filtration is provided by a separation/filtration battery;
- The metering installation will consist of several parallel metering lines (operating and standby) equipped with ultrasonic meters for the purpose of measuring the quantities of natural gas delivered, each line being identically equipped with three independent metering systems (Pay, Check and Verify); the independent Pay and Check systems will use dual ultrasonic meters and the Verify systems will use a single ultrasonic meter.



The upgraded Negru Voda 2 Metering Station will be equipped with separation/filtration plant and metering equipment:

- the separation/filtration is provided by a separation/filtration battery;
- the metering installation will consist of several parallel metering lines (in operation and in standby) equipped with ultrasonic meters for the purpose of measuring the quantities of natural gas delivered, each line being identically equipped with two independent metering systems (Pay and Check); the independent Pay and Check systems will use dual ultrasonic meters.

Stage 1: Creating the possibility of bi-directional gas flow on T2 at GMS Isaccea 2 respectively creating the possibility of bi-directional gas flow on T2 at GMS Negru Voda 2 - completed.

Stage 2: The replacement/upgrade of metering systems at GMS Isaccea 2 and GMS Negru Voda 2 respectively. The project is at an early stage and will be further developed depending on the results of the market demand assessment for incremental capacity for the interconnection points located on the T2 pipeline.

Project justification:	Ensuring bi-directional flow at the border with Ukraine and Bulgaria on the T2 transit pipeline						
Economic data:	Estimated value of the investment euro 26,65 million						
Impact on cross-border capacity:	No additional capacity is developed.						
Project Stage:	Stage 1 – completed Stage 2 - market research						
TYNDP: TRA-N-602.		PCI status: -					
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion time	-	-	-	-	2024	2024	2028
Total estimated value of the project (euro million)	-	-	-	-	26,65	26,65	26,65

7.12 Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline

Project name:	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline
Project number:	7.12
Project beneficiary:	SNTGN Transgaz SA 
Project type:	The security of supply, Energy security
Estimated completion date	2028 <i>The project will be developed according to the results of the market demand assessment for incremental capacity for the interconnection points located on the T2 and T3 pipelines on the Bulgaria - Romania - Ukraine transmission direction (Transbalkan corridor).</i>
Project Objective:	Creating the possibility of bi-directional flow on the T3 pipeline, part of the Transbalkan corridor

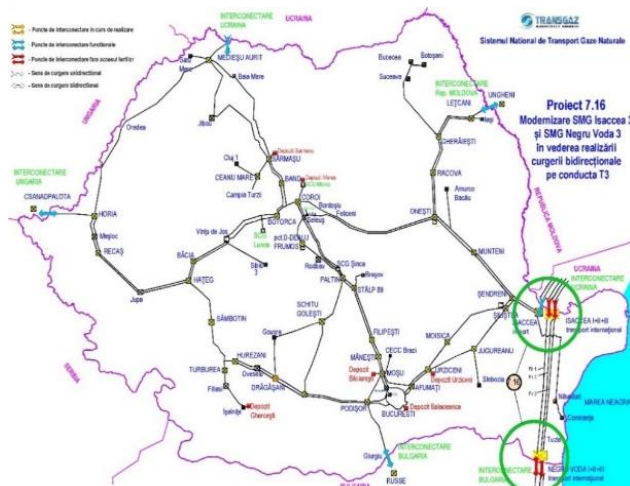
Project description:

The upgraded Isaccea 3 Metering Station will be equipped with separation/filtration plant and metering plant:

- the separation/filtration is provided by a separation/filtration battery;
- the metering installation will consist of several parallel metering lines (in operation and in standby) equipped with ultrasonic meters for the purpose of measuring the quantities of natural gas delivered, each line being identically equipped with three independent metering systems (Pay, Check and Verify);
- the stand-alone Pay and Check systems will use dual ultrasonic meters, and the Check systems will use a single ultrasonic meter.

The upgraded Negru Voda 3 Metering Station will be equipped with separation/filtration plant and metering equipment:

- the separation/filtration is provided by a separation/filtration battery;
- The metering installation will consist of several parallel metering lines (in operation and back-up) equipped with ultrasonic meters for the purpose of measuring the quantities of natural gas delivered, each line being identically equipped with two independent metering systems (Pay and Check);
- the standalone Pay and Check systems will use dual ultrasonic meters.



Stage 1: Creating the possibility of bi-directional gas flow on T3 at GMS Isaccea 3 respectively creating the possibility of bi-directional gas flow on T3 at GMS Negru Voda 3 - completed.

Stage 2: The replacement/upgrade of metering systems at Isaccea 3 and Negru Voda 3 GMSs is next. The project is at an early stage and will be developed depending on the results of the market demand assessment for incremental capacity for interconnection points on the T3 pipeline.

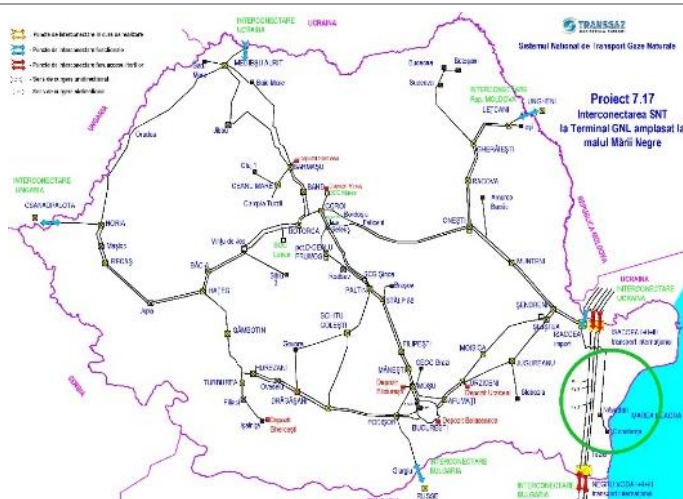
Project justification:	Ensuring bi-directional flow at the border with Ukraine and Bulgaria on the T3 transit pipeline, part of the Transbalkan corridor						
Economic data:	Estimated investment value euro 26.65 million						
Impact on cross-border capacity:	No additional capacity is being developed.						
Project Stage:	Stage 1 - completed Stage 2 - market research						
TYNDP: -		PCI status: -					
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date	-	-	-	-	2028	2028	2028
Total estimated value of the project (€ million)	-	-	-	-	26,65	26,65	26,65

7.13 Interconnection between NTS and the Black Sea LNG Terminal

Project name:	Interconnection between NTS and the Black Sea LNG Terminal
Project number:	7.13
Project beneficiary:	SNTGN Transgaz SA
Project type:	The security of natural gas supply
Estimated completion date	2028
Project Objective:	Creating the transmission capacity to take over natural gas from the LNG terminal on the Black Sea shore

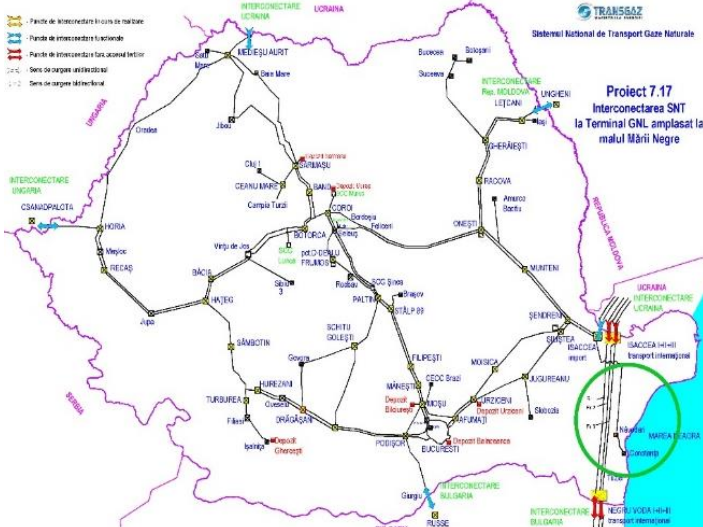
Project description:

Taking over natural gas from the Black Sea shore through an LNG terminal involves interconnecting the National Natural Gas Transmission System to the LNG terminal by building a natural gas transmission pipeline, about 25 km long, from the Black Sea shore to the T1 and T2 pipelines. The capacity and design pressure for this pipeline will be determined according to the quantities of natural gas available at the Black Sea shore.



Project justification:	Ensuring the security of gas supply from an alternative source						
Connecting with other projects:	LNG terminal located on the shores of the Black Sea.						
Economic data:	Estimated value of the investment euro19.6 million						
Impact on cross-border capacity:	The project has no impact on cross-border capacities, but contributes to diversification of sources and increased security of gas supply.						
Project Stage:	The project is at an early stage.						
TYNDP: -		PCI status: -					
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date	-	-	-	-	2028	2028	2028
Total estimated amount of the project (euro million)	-	-	-	-	19,6	19,6	19,6

7.14 Black Sea LNG terminal

Project name:	Black Sea LNG terminal
Project number:	7.14
Project beneficiary:	SNTGN Transgaz SA
Project type:	The security of natural gas supply
Estimated completion date	2028
Project Objective:	The construction of an LNG terminal on the Black Sea shore
Project description:	In order to diversify the natural gas supply sources, the opportunity has been identified to build an LNG terminal on the Black Sea coast with all the related facilities to be able to take over LNG quantities from the Caspian Sea area and the Middle East. The type of the terminal and its facilities and capacity will be determined in the design stages according to the level of gas demand resulting from the capacity booking procedures. 

Project justification:	The implementation of the Project results in diversification of natural gas supply resources
Connecting with other projects:	The interconnection of the NTS to the LNG Terminal located on the Black Sea shore.
Economic data:	Euro 360 million
Impact on cross-border capacity:	The project has no impact on cross-border capacities, but contributes to diversification of sources and increased security of gas supply.
Project Stage:	The project is at an early stage
TYNDP:	PCI status:
Project changes: new project	

8. DIRECTIONS FOR THE DEVELOPMENT OF THE NATURAL GAS STORAGE SYSTEM

Natural gas transmission and storage activities are complementary: storage allows seasonal demand to be balanced and provides support for consumption peaks, but pipelines and transmission infrastructure are needed to bring natural gas to storage facilities or distribute it to consumers. An example of this is the support for Depogaz Ploiești SA projects, which are at a more advanced stage. TRANSGAZ SA must develop complementary transmission infrastructure as follows:

8.1 Increasing daily extraction capacity at the Bilciurești Storage Facility - Upgrading the natural gas storage system infrastructure – Bilciurești

- The upgrading of the Bilciurești storage facility will increase daily extraction capacity, which requires transport infrastructure capable of handling the increased volumes.

8.2 Increasing the underground natural gas storage capacity of the Ghercești storage facility

- The Ghercești-Jitaru transmission pipeline, currently under development, supports the injection/extraction capacity of the Ghercești storage facility.

Below, we present all the major storage projects of Depogaz Ploiești and Depomureș, noting that at this time, SNTGN Transgaz SA has plans to develop complementary transmission infrastructure only for projects 8.1 and 8.2, which are at a more advanced stage of implementation (FID).

We would like to point out that for the rest of the projects belonging to Depogaz Ploiești (8.3, 8.4, and 8.5) and Depomureș, Transgaz SA is not currently required to develop the transmission infrastructure.

I. DEPOGAZ PLOIEȘTI-MAJOR STORAGE PROJECTS

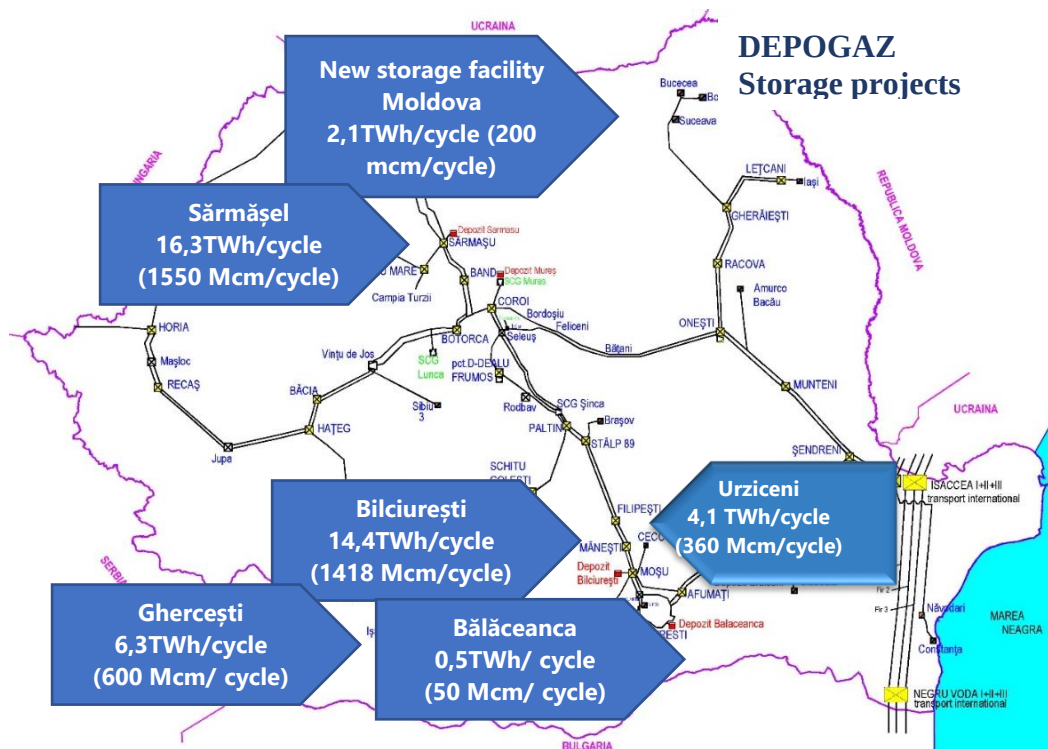


Figure 6 - Major natural gas storage projects – Depogaz

8.1 Increasing the daily extraction capacity at the Bilciuresti Storage Facility - Upgrading the infrastructure of the natural gas storage system-Bilciuresti

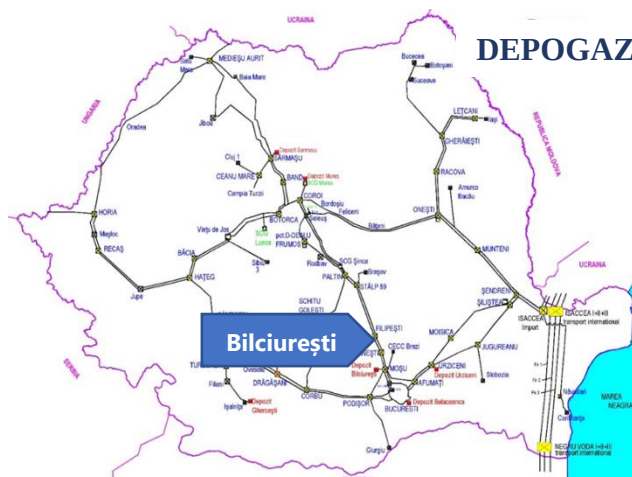
Project name:	Increasing the daily extraction capacity at the Bilciuresti Storage Facility - Upgrading the infrastructure of the natural gas storage system-Bilciuresti
Project number:	8.1
Project beneficiary:	Depogaz Ploiești
Project type:	Storage Capacity Increase
Estimated completion date	2027
Project scope:	The project aims to increase current extraction capacity from 14 million cm/day to around 20 million cm/day, coupled with an increase in storage capacity of 108 million cm/cycle.
Project description: In order not to disrupt the natural gas storage activity, the project is implemented in stages and consists of the following:	

Stage I:

- Upgrading works for the drying station group 57 Bilciurești - works completed;
- Upgrading works for drying station group 101 Bilciurești - works completed;
- Construction works of a new drying station at Group 145 Bilciurești, as well as reconfiguration and upgrading works of the technological installations in the storage facility - works completed 2021;
- Drilling works for four wells and works for the above ground technological installations related to these wells - works completed 2023;
- Upgrading works of the technological installations inside the Butimanu compressor station - the works will be completed in Q I 2024.

Stage II:

- Butimanu - Bilciurești collector with 24" diameter (DN 600 PN 150);
- Upgrading of installations within the Bilciurești natural gas storage groups;
- Upgrading of 39 injection/extraction wells;
- Upgrading of M3 Butimanu compression module cooling system;
- New pipeline (11 km) for gas transmission between Bilciurești storage facility and Butimanu compressor station
- Digitisation of the natural gas storage process.



Project justification:

Ensuring the security of the natural gas supply.

Technical data:

- Increase the daily gas delivery capacity from the Bilciurești storage by 6 million cubic meters/day, giving a total daily extraction capacity of 20 million cubic meters/day;
- For all storage facility operated by Depogaz, the completion of the project will contribute to increase the daily extraction capacity from storage facilities at national level by about 20%;
- The increase in storage capacity by 108 million cubic metres per cycle, giving a total storage capacity of 1 418 million cubic metres per cycle.

Economic data:

Euro 156 million of which :
Stage I approximately Euro 32.5 million ;
Stage II approximately Euro 123.5 million.

The project stage:

Construction stage 1, FEED completed for stage 2

TYNDP: TYNDP 2022: UGS-F-311

PCI status: 6.20.7

Project changes:

	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date						2026	2027
Total estimated value of the project (Euro million)						123	156

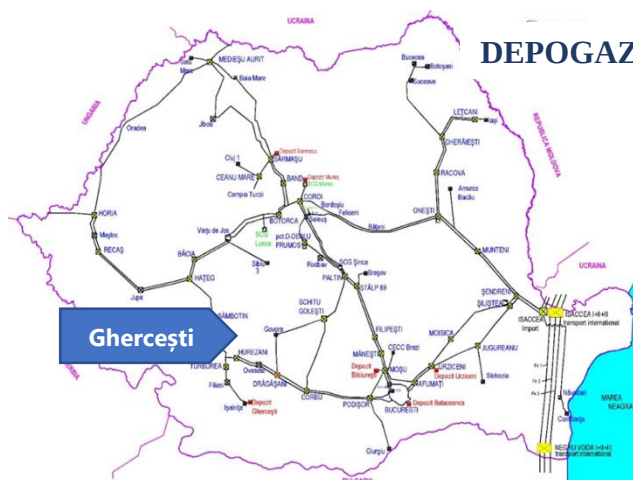
8.2 Increasing the underground natural gas storage capacity of the Ghercești storage facility

Project name:	Increasing the underground natural gas storage capacity of the Ghercești storage facility
Project number:	8.2
Project beneficiary:	Depogaz Ploiești
Project type:	Storage Capacity Increase
Estimated completion date	2028
Project Objective:	The project aims to complete the infrastructure of the Ghercești natural gas storage system to ensure operating conditions at a capacity of 600 million cm/cycle.

Project description:

The project will consist of the following:
gas compressor station;

- extension of drying and gas metering installations;
- upgrading of 20 injection/extraction wells;
- interconnection of Ghercești gas storage facility with the NTS;
- installation of photovoltaic panels for electricity production from renewable sources;
- installation of facilities for the preparation of thermal agent from renewable sources for heating administrative and technological spaces;
- introduction of hydrogen ready engines to drive compressors;
- digitisation of natural gas storage and extraction processes.



Project justification:	Ensuring the security in the natural gas supply.
Technical data:	- Increasing the daily gas injection capacity by 3 million cubic meters per day, giving a total daily injection capacity of 5 million cubic meters per day; - Increasing the daily gas delivery capacity by 3 million cubic meters per day, resulting in a total daily extraction capacity of 5 million cubic meters per day; - Increasing the storage capacity by 450 million cubic meters/cycle resulting in a total storage capacity of 600 million cubic meters/cycle; - For all Depogaz-operated storage facilities, the completion of the project will increase the national storage capacity by about 16% and the daily extraction capacity from storage facilities by about 10%;
Economic data:	Euro 126 million
Project stage:	FEED - completed
TYNDP: UGS - F - 398	PCI status: -
Project changes:	

	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date						2026	2028
Total estimated value of the project (Euro million)						55	126

8.3 New underground natural gas storage facility in Fălticeni (Moldova)

Project name:	New underground natural gas storage facility in Fălticeni (Moldova)
Project number:	8.3
Project beneficiary:	Depogaz Ploiești
Project type:	New storage facility
Estimated completion date	2032
The Project scope:	The project aims to develop a new underground storage facility in north-eastern Romania (Moldova region) by converting one of the Pocoleni or Davideni gas fields into an underground storage facility to provide a storage capacity in a gas security deficit area; Newly created storage capacity of 200 million cm/cycle; For all Depogaz-operated storage facilities, the completion of the project will contribute to an increase in national storage capacity by about 7% and in daily extraction capacity from depots by about 7%.

Project description:

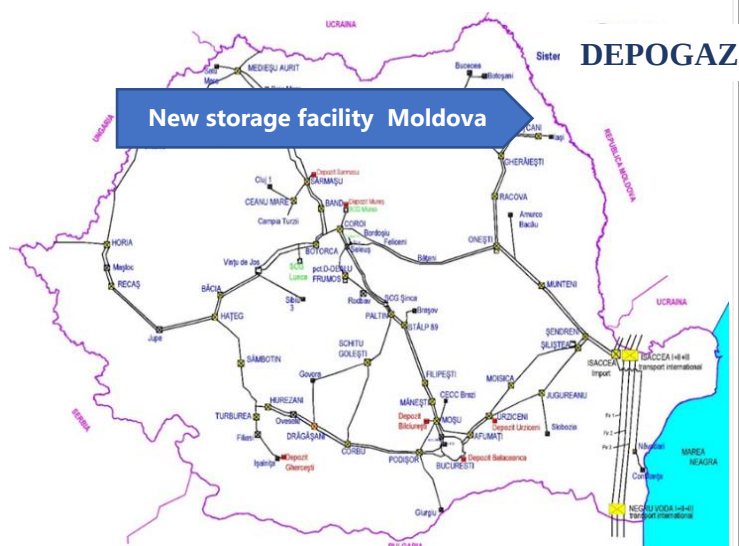
The transformation of one or more of the following depleted fields into an underground storage site: Pocoleni, Comanești, Todirești or Davideni.

Characteristics:

- capacity of about 200 million cm/cycle;
- injection capacity of approximately 1.4 million cm/day;
- extraction capacity of about 2 million cm/day.

The project will consist of the following

- natural gas compressor station;
- drying plants and natural gas metering;
- technological installations injection/extraction probes;
- drilling injection/extraction wells;
- interconnection of natural gas storage with the NTS;
- inactive natural gas stock;
- installation of facilities for the preparation of electricity and heat from renewable sources, for administrative and technological needs;



- digitizing the natural gas storage and extraction processes.

Project justification:	Ensuring the security of gas supply.						
Economic data:	Euro 120 million						
Project Phase:	Feasibility study - in preparation The project is conditional on obtaining agreements from Romgaz and ANRM for the conversion of a depleted storage facility into a storage facility.						
TYNDP: TYNDP 2022: UGS-N-399				PCI status:			
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date						2026	2032
Total estimated value of the project (Euro million)						80	120

8.4 Increasing underground natural gas storage capacity at the Sărmășel storage facility (Transylvania)

Project name:	Increasing the underground natural gas storage capacity at the Sărmășel storage facility (Transylvania)
Project number:	8.4
Project beneficiary:	Depogaz Ploiești
Project type:	Increasing storage capacity
Estimated completion date	2030
Project Objective:	The project aims to expand the existing underground storage at Sărmășel from a capacity of 900 million cm/cycle to 1550 million cm/cycle (an increase of 650 million cm/cycle), increase the injection capacity by 4 million cm/day to a total of 10 million cm/day, increase the extraction capacity by 4 million cm/day to a total of 11.5 million cm/day.
Project description: From a technical point of view, the project consists of drilling new wells, building a modern above ground infrastructure complying with the requirements of European safety and control standards, extending the natural gas compression facilities and upgrading and optimising the existing separation and fiscal metering facilities. The injection/extraction system is designed to ensure that natural gas flows for injection/extraction are conveyed through dedicated collecting pipelines for each facility. The project consists of the extension of the Sărmășel gas storage facilities and is carried out in stages: Stage I:	

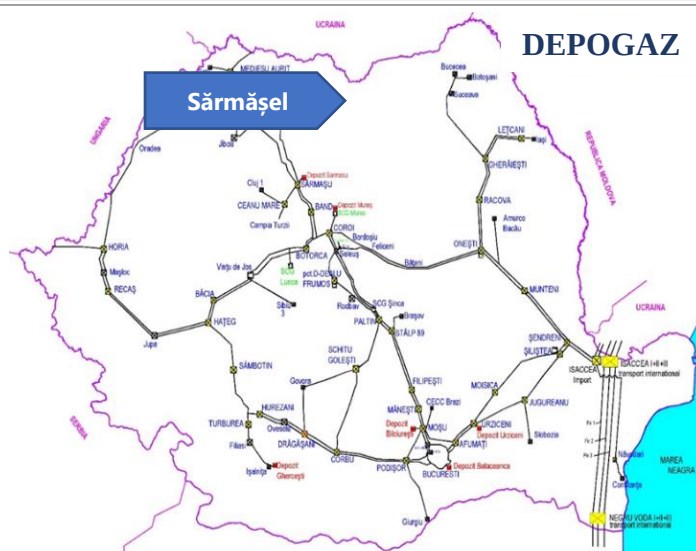
- Upgrading of 12 existing wells;
- Drilling 6 new wells
- Above-ground technology facilities for 6 wells.

Stage II:

- Upgrading 15 existing wells;
- Realisation of 8 technological groups;
- 7.70 km of adduction pipelines;
- 9.60 km of collector pipelines;
- Separation and metering system upgrade (ISM);
- Installation of facilities for the production of electricity and heat from renewable sources for administrative and technological needs;
- Digitising the natural gas storage process.

Stage III:

- drilling 32 new wells;
- 41 km of adduction pipelines;
- 9.6 km of collector pipes;
- 3 compressor units equipped with gasomotocompressors driven by natural gas mixed with up to 20% hydrogen;
- 2 gas drying installations with TEG;
- Separation and metering plant extension (ISM)
- Connection to the National Gas Transmission System (NTS);
- Expansion of facilities for the production of electricity and heat from renewable sources for administrative and technological needs;
- Extending the digitisation of the natural gas storage process.



Project justification:

Following the implementation of the technical solution resulting from the feasibility study, the new designed infrastructure will allow:

- Increasing the storage capacity from 900 million cm/cycle to 1550 million cm/cycle;
- Increasing the injection capacity by 4 million cm/day to a total of 10.5 million cm/day and increasing the extraction capacity by 4 million cm/day to a total of 11.5 million cm/day;
- On all of the storage facilities operated by Depogaz, the completion of the project will contribute to increasing the national storage capacity by about 23% and the daily extraction capacity from the storage facilities at national level by about 14%; energy from renewable sources (photovoltaic panels) and the use of LED technology for indoor and outdoor lighting system
- The project contributes to the reduction of greenhouse gas emissions and pollutant emissions in the context of decarbonisation policies at European level and the increase of ETS emission allowances prices in the context of policies already adopted by the European institutions. Through the implementation of the project, the role of natural gas or gas from renewable sources is expected to increase significantly;
- Contribution to the fulfilment of the N-1 rule at regional level in accordance with EU Regulation 1938/2017. The implementation of the project ensures an increase of the N-1 indicator from 106.3% to 111.81%;

	▪ Reducing the dependence on gas imports during the cold season.						
Economic data:	Euro 185 million						
Project stage:	The feasibility study - completed Upgrading work on 12 wells was completed during 2023. Technical design for drilling 6 new wells - completed.						
TYNDP: TYNDP 2022: UGS-N-371				PCI status:			
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date						2026	2030
Total estimated value of the project (Euro million)						163,1	185

8.5 Upgrading of the natural gas storage infrastructure – Bălăceanca

Project name:	Upgrading of the natural gas storage infrastructure - Bălăceanca
Project number:	8.5
Project beneficiary:	Depogaz Ploiești
Project type:	Increasing the storage capacity
Estimated completion date	2032
Project Objective:	The project aims to use the storage in a multi-cycle regime and increase the daily gas delivery capacity of the Bălăceanca storage to 1.6 million cm/day. In order to ensure a higher degree of operational safety and to complement the capacity of the existing natural gas infrastructure, it is necessary to upgrade the existing facilities and to build new above ground facilities that will take the additional flow and will provide the necessary flexibility for the multi-cycle use of the storage.
Project description: From a technical point of view, the project consists of drilling new wells, upgrading the existing wells and the above ground infrastructure in accordance with the requirements of European safety and control standards, expanding, upgrading and optimising the existing compression, separation and fiscal metering facilities. The project will consist of the following: - systemization of suction/refilling, natural gas injection/extraction manifolds; - Expansion and upgrading of Bălăceanca compressor station;	

- Expansion and upgrading of TEG drying station;
- upgrading of the Bălăceanca metering panel;
- upgrades within storage groups;
- drilling and equipping of 3 new wells;
- upgrading of old wells;
- digitization of the natural gas storage process.



Project justification:	The completion of the project will contribute to the flexibility of the national storage system through the use of the multi-cycle storage system and increase the storage utilisation by 200%.	
Economic data:	Euro 50 million	
Project stage:	The feasibility study completed.	
TYNDP: UGS-N-606		PCI status:
The project changes: - new project		

II. DEPOMURES TÂRGU-MURES-MAJOR STORAGE PROJECT

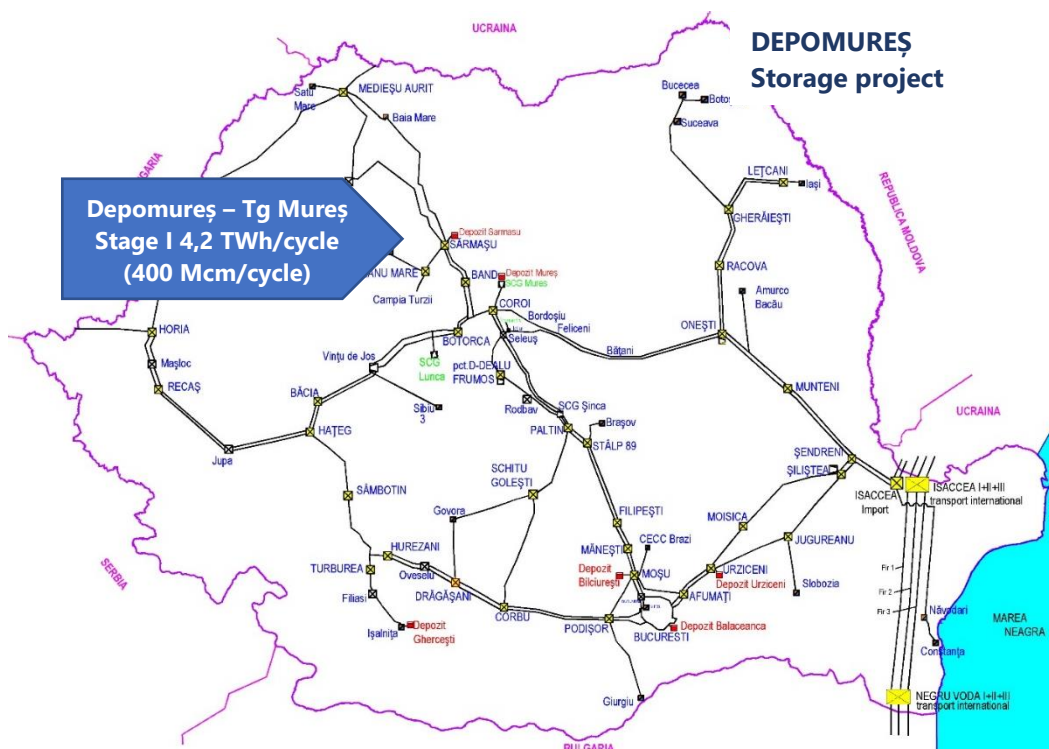


Figure 7 - Major natural gas storage projects – Depomures

8.6. Storage unit –Depomureș

Project name:	Storage unit-Depomureș
Project number:	8.6
Project beneficiary:	Depomureș Târgu Mureș
Project type:	Upgrading
Estimated completion date	2026 (Stage1)
Project Objective:	The project aims at upgrading and developing the Târgu-Mureș underground natural gas storage facility in order to improve the technical conditions of gas delivery - reception at the Târgu-Mureș storage facility - NTS interface, implicitly increasing the degree of flexibility of the services provided, especially in the context of the current dynamics of the gas market.

Project description:

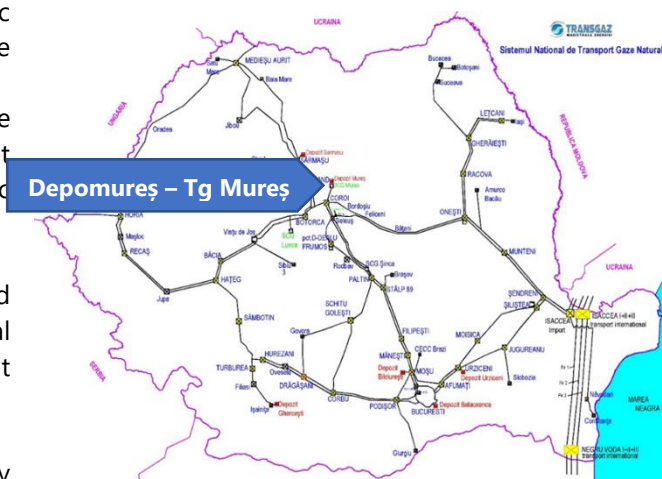
The project initiated by Depomures consists in the refurbishment and development of the Târgu-Mureș underground natural gas storage facility, with a current capacity of 300 million cubic meters. The development project of the natural gas storage operator Depomures SA is a project that is being carried out in stages (2 stages).

The main objectives of this project are:

- building of its own compression installations to serve the Târgu Mureș storage facility both for gas injection into the storage facility and for gas extraction for delivery to the NTS;
- increasing the flexibility of the storage on the one hand by increasing the storage gas delivery pressure at the interface with the NTS to 35 bar and on the other hand by increasing the daily injection and extraction capacity to approx. 3.5 million cm/day after implementation of phase 1 of the project, i.e. to approx. 5 million cubic metres/day after the implementation of the second phase of development, i.e.
- increasing the useful volume of the storage facility to 400 million cubic metres in a first stage (Stage 1) and to 600 million cubic metres in a subsequent phase (Stage 2).

The project mainly consists of the following:

- central gas station (electrically actuated compressor units, gas drying, commercial two-way gas metering panel, adjacent facilities);
- new storage collector;
- upgrading of above ground technology installations to increase operating pressure, new wells.



Project justification:

The implementation of the project will bring a number of benefits both nationally and regionally through :

- Ensuring the energy security and reducing dependence on imported fossil fuels through additional useful volume
- Increased integration of an efficient and competitive internal market by reducing and preventing infrastructure bottlenecks related to gas supply, i.e. increased flexibility of gas storage services which will contribute to increased

	market liquidity, with the wholesale market able to offer more flexibility to the system						
	- Grid interoperability across borders and sectors through its overall contribution to increasing gas export capacities, i.e. reducing risks of intermittency of renewable energy						
	- Supporting the decarbonisation of the economy and promoting energy efficiency through its overall contribution to the energy transition and balancing the significant renewable energy capacity to be installed in Eastern Europe						
Economic data:	Euro 37 million - Stage I						
Project stage:	Stage 1 construction.						
TYNDP:	TYNDP 2022: UGS-A-233	PCI status: Yes – list V(6.20.4)			CBCA decision: yes		
Project changes:							
	TYNDP 2014	TYNDP 2017	TYNDP 2018	TYNDP 2019	TYNDP 2020	TYNDP 2022	TYNDP 2024
Estimated completion date						2026	2026 (Stage1)
Total estimated value of the project (Euro million)						87	37 (Stage 1)

9. DEVELOPMENT DIRECTIONS FOR HYDROGEN TRANSPORT

9.1 The hydrogen market in Romania ³

In Romania, the hydrogen is currently a raw material used mainly in refining, fertiliser production and in the chemical industry, being used in most cases at the place of its production.

In the expected context, based on the consumption and decarbonisation targets proposed by: NESCAP (2021), Directive (EU) 2018/2021 on the promotion of energy from renewable sources (currently under review), Fit-for-55, REPowerEU (2022), taking into account that the role of hydrogen will not only be as a raw material but also as an energy carrier and fuel, the future value chain will incorporate the following segments:

- Renewable hydrogen production, considered a priority, and, to a lesser extent, low-carbon hydrogen from electrolysis of water and, at a later stage, pyrolysis of methane gas after 2030;
- Storage of hydrogen, in gaseous, liquid form, as liquid-organic hydrogen carrier (LOHC), or ammonia;
- The transport and distribution of gaseous hydrogen
 - through pipelines,
 - in pressurised vessels, by road, rail, inland waterway or sea;
- The applications and use of hydrogen are much more diverse than today, depending on local conditions: as a fuel for transport, to reduce emissions in difficult to decarbonise

³ National Strategy for Hydrogen

industries such as refining and petrochemicals, chemicals, metallurgy, cement, ceramics and paper industries, in high temperature industrial processes, but also as an energy storage medium and feedstock for synthetic fuels.

9.2 Hydrogen production in Romania ⁴

In Romania, most of the hydrogen is produced by steam methane reforming, catalytic reforming and, to a much lesser extent, by water electrolysis and consumed in the industrial processes necessary for production.

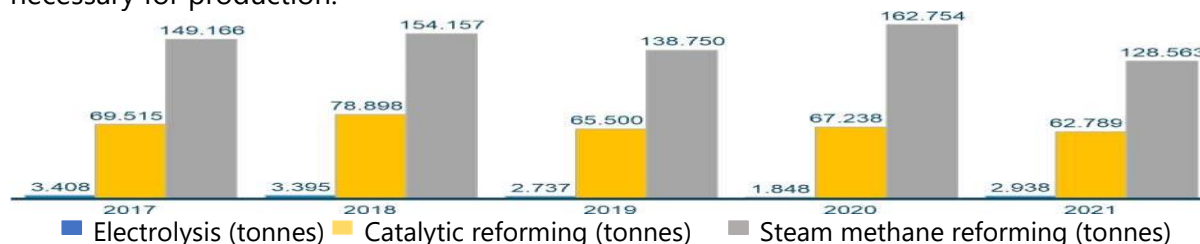


Chart 15- - The hydrogen production by technology type in tonnes for the period 2017-2021, Source: Horvath analysis based on information received from the main hydrogen producers/consumers in the industry (February 2022)

With a perspective of decarbonisation, the grey hydrogen production should be replaced by renewable hydrogen and, to a lesser extent, low carbon hydrogen.

9.3 Hydrogen consumption in Romania ⁵

Currently, hydrogen consumption in Romania is exclusively for the industrial sector, mainly in refining, chemicals, steel and chemical fertiliser production.

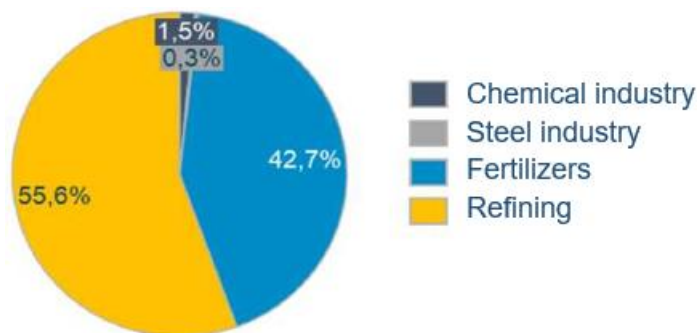


Chart 16 - The Hydrogen consumption by industry, expressed in average percentages, by 2017 - 2021, Source: Horvath analysis (February 2023)

9.4 The estimation of hydrogen consumption ⁶

In order to estimate the potential consumption and production of renewable hydrogen and low carbon footprint hydrogen in Romania by 2030, a number of scenarios have been analysed in the

⁴ The National Hydrogen Strategy

⁵ The National Hydrogen Strategy

⁶ The National Hydrogen Strategy

National Hydrogen Strategy to estimate hydrogen consumption (demand) and its contribution to achieving the 2030 CO₂ emission reduction targets.

Taking into the account all the scenarios analysed and comparing the ratio between the cost of implementing the strategy and the level of CO₂ reduction for each type of hydrogen use, the *optimal scenario* was selected.

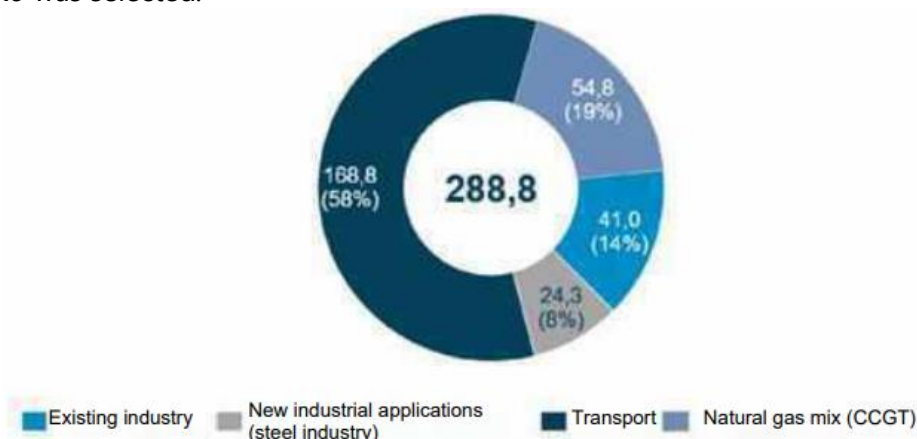


Chart 17- Summary of the estimated consumption of renewable and reduced footprint hydrogen emissions by sector expressed in percentages for the year 2030, Source: Horvath analysis (April 2023)

The consumption estimates were made on the basis of European and national targets, technical assumptions, analysis of the current situation, and with the help of the working group set up and coordinated at the Ministry of Energy, and structured by 5 sectors:

- 1. The Industrial consumption**, where renewable and, to a lesser extent, low carbon footprint hydrogen are used to replace the grey hydrogen currently used in the industrial processes;
- 2. Consumption in the steel industry**, where renewable hydrogen is used in new industrial applications for steel production;
- 3. Consumption in the transport sector**, where renewable hydrogen is used as a fuel for the following modes of transport: heavy and medium duty road haulage, passenger cars, rail, public passenger transport and maritime transport, as well as in the aviation sector, both as an addition to aviation fuels and to fuel vehicles used in airport operations;
- 4. Consumption of renewable hydrogen mixed with natural gas for new CCGT projects** - with a total capacity of 2,615 MW, to be installed under the NREP and NESCAP.
- 5. Consumption of renewable hydrogen mixed with natural gas for residential heating**, which has not been quantified in the optimal scenario, but is targeted as a sector that can contribute to the development of projects promoting hydrogen production and sector coupling.

9.5 Transgaz projects for hydrogen transmission

Transgaz' membership of the European Hydrogen Backbone is a suitable solution for the transmission and use of hydrogen in areas without localised production.

Transgaz, which has joined the EHB initiative, has identified 11 corridors that could be included in the "backbone" of the future European hydrogen transport system:

1. Transit pipeline corridor (using a pipeline);
2. Black Sea - Podișor corridor;
3. Giurgiu - Podișor - Jupa - Nădlac corridor (BRUA corridor);
4. Onești - Gherăești - Lețcani - Ungheni (Republic of Moldova) corridor;
5. Petrovaselo - Comloșu Mare (Serbia) corridor;
6. Jupa - Prunișor corridor;
7. Isaccea - Onești corridor;
8. Siliștea corridor - Bucharest;
9. Onești - Coroi - Hațeg corridor;
10. Coroi - Medieșu Aurit corridor;
11. Podișor - Coroi corridor.

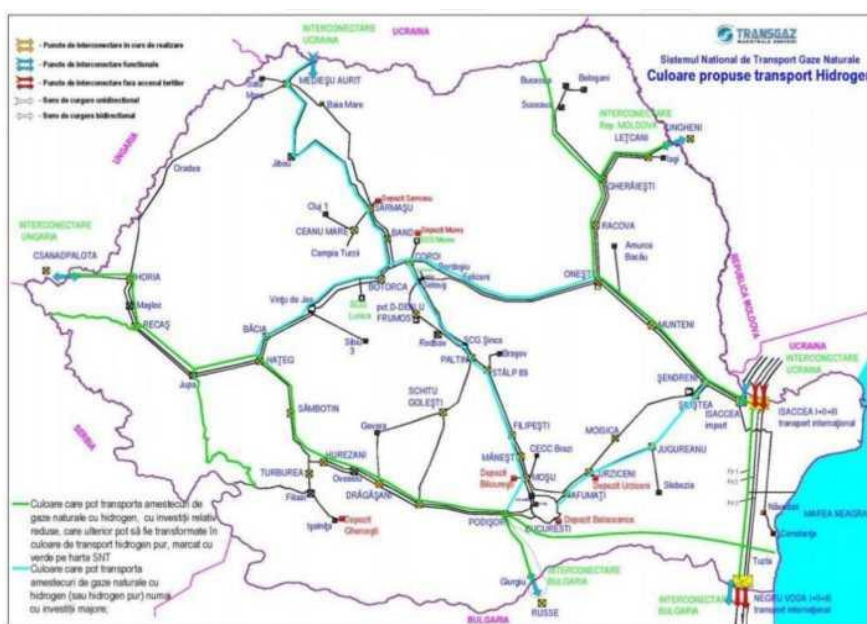


Figure 8 - Proposed "backbone" of the NTS for hydrogen transport,

Source: Transgaz (2021)

9.5.1 Gas transmission infrastructure repurposing projects for hydrogen transmission

9.5.1.1 Upgrading of the Isaccea - Jupa pipeline for hydrogen transmission

Project name:	Upgrading of the Isaccea - Jupa pipeline for hydrogen transmission
Project number:	9.5.1.1
Project beneficiary:	SNTGN Transgaz SA 
Project type:	Transport of hydrogen or mixture of natural gas with hydrogen
Estimated completion date	2040

Project Objective:	Repurposing of natural gas transmission infrastructure for hydrogen transport
Project description:	The project implies the repurposing of existing natural gas transmission pipeline sections on the Isaccea - Jupa corridor so as to provide a hydrogen pipeline on this corridor, including the repurposing of some natural gas compressor stations. The length of the repurposed pipelines is approx. 550 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sector coupling between the electricity system and H2 transmission systems.
Project justification:	The project will contribute to security of supply and the development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low-carbon sources into the natural gas transmission system in order to align with existing European Directives, Strategies and Agreements.
Economic data:	Euro 378.6 million (+/- 30%, preliminary estimate at 2021 level)
Project stage:	The project is under analysis, at the conceptual stage.
TYNDP: HYD-N-640	PCI status:
Project changes: new project	

9.5.1.2 Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission

Project name:	Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission
Project number:	9.5.1.2
Project holder:	SNTGN Transgaz SA 
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen
Estimated completion date	2040
Project Objective:	Repurposing the natural gas transmission infrastructure for hydrogen transport.
Project description:	The project involves the repurposing of a natural gas transmission pipeline to transport hydrogen and includes the following objectives: • New DN800 pipeline between RO/HU border - Jupa-Podisor. • New H2 compressor stations. • One metering station at the RO/HU border. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.
Project justification:	The project will contribute to ensuring the security of supply and diversification of energy sources in the countries involved. The project contributes to the development of competition between domestic and

	diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.
Economic data:	Euro 464,4 million (+/- 30%, preliminary estimate at 2021 level)
Project phase:	The project is under analysis, in the conceptual stage
TYNDP: HYD-N-999	PCI status:
Project changes: new project	

9.5.1.3 Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission

Project name:	Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission		
Project number:	9.5.1.3		
Project holder:	SNTGN Transgaz SA		
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen		
Estimated completion date	2042		
Project Objective:	Retrofitting the natural gas transmission infrastructure for hydrogen transmission		
Project description: The project involves converting a natural gas pipeline to transport hydrogen. The length of the pipeline is about 308 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.			
Project justification:		The project will contribute to ensuring the security of supply and diversification of energy sources in the countries involved. The project contributes to the development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.	
Economic data:		Euro 199,6 million (+/- 30%, preliminary estimate at 2021 level)	
Project phase:		The project is under analysis, in the conceptual stage	
TYNDP: HYD-N-608		PCI status:	
Project changes: new project			

9.5.1.4 Upgrade of the Onești - Ungheni pipeline for hydrogen transmission

Project name:	Upgrade of the Onești - Ungheni pipeline for hydrogen transmission		
Project number:	9.5.1.4		
Project holder:	SNTGN Transgaz SA		
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen		
Estimated completion date	2040		
Project Objective:	Retrofitting of the natural gas transmission infrastructure for hydrogen transport		
Project description: The project involves retrofitting a natural gas pipeline to transport hydrogen. The length of the pipeline is about 183 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.			
Project justification:		The project will contribute to security of supply and diversification of energy sources in the countries involved. The project contributes to the development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.	
Economic data:		Euro 156,4 million (+/- 30%, preliminary estimate at 2021 level)	
Project phase:		The project is under analysis, in the conceptual stage	
TYNDP: HYD-N-625		PCI status:	
Project changes: new project			

9.5.1.5 Upgrade of the Romania - Serbia interconnection for hydrogen transmission

Project name:	Upgrade of the Romania-Serbia interconnection for hydrogen transmission	
Project number:	9.5.1.5	
Project holder:	SNTGN Transgaz SA 	
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen	
Estimated completion date	2040	
Project Objective:	Repurposing the natural gas transmission infrastructure for hydrogen transmission	

Project description: The project involves repurposing a natural gas pipeline to transport hydrogen. The length of the pipeline is about 85 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.		
Project justification:	The project will contribute to security of supply and diversification of energy sources in the countries involved. The project contributes to the development of the competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.	
Economic data:	Euro 143.8 million (+/- 30%, preliminary estimate at 2021 level)	
Project phase:	The project is under analysis, in the conceptual stage.	
TYNDP: HYD-N-648		PCI status:
Project changes: new project		

9.5.1.6 Upgrade of the Coroi-Medioșu Aurit pipeline for hydrogen transmission

Project name:	Upgrade of the Coroi - Mediasu Aurit pipeline for hydrogen transmission	
Project number:	9.5.1.6	
Project holder:	SNTGN Transgaz SA 	
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen	
Estimated completion date	2040	
Project Objective:	Repurposing of the natural gas transmission infrastructure for hydrogen transmission	
Project description: The project involves repurposing a natural gas pipeline to transport hydrogen. The length of the pipeline is about 300 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.		
Project justification:	The project will contribute to security of supply and diversification of energy sources in the countries involved. The project contributes to the	

	development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.	
Economic data:	Euro 156,5 million (+/- 30%, preliminary estimate at 2021 level)	
Project phase:	The project is under analysis, in the conceptual stage.	
TYNDP: HYD-N-730		PCI status:
Project changes: new project		

9.5.1.7 Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission

Project name:	Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission		
Project number:	9.5.1.7		
Project holder:	SNTGN Transgaz SA		
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen		
Estimated completion date	2040		
Project Objective:	Repurposing of natural gas transmission infrastructure for hydrogen transmission		
Project description: The project involves repurposing a natural gas pipeline to transport hydrogen. The length of the pipeline is about 185 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.			
Project justification:	The project will contribute to security of supply and diversification of energy sources in the countries involved. The project contributes to the development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.		
Economic data:	Euro 99,4 million (+/- 30%, preliminary estimate at 2021 level)		
Project phase:	The project is under analysis, in the conceptual stage.		
TYNDP: HYD-N-756		PCI status:	
Project changes: new project			

9.5.1.8 Upgrading the Vadu - T1 pipeline for hydrogen transport

Project name:	Upgrade of the Vadu - T1 pipeline for hydrogen transmission		
Project number:	9.5.1.8		
Project holder:	SNTGN Transgaz SA  TRANSGAZ MAGISTRALA ENERGIE		
Project type:	Transmission of hydrogen or mixture of natural gas with hydrogen		
Estimated completion date	2040		
Project Objective:	Repurposing the natural gas transmission infrastructure for hydrogen transmission		
Project description: The project involves repurposing a natural gas pipeline to transport hydrogen. The length of the pipeline is about 25 km. The sustainability of the project is confirmed by the reduction of greenhouse gas emissions in the first phase by gradually replacing fossil gas sources from grey H2 to green H2 at existing H2 users. Along the pipeline route, there will be an opportunity to connect new H2 producers/consumers, which also contributes to the sectoral coupling between the electricity system and H2 transmission systems.			
Project justification:	The project will contribute to security of supply and diversification of energy sources in the countries involved. The project contributes to the development of competition between domestic and diversified sources of imported H2 and will benefit hydrogen prices by keeping the price of hydrogen low in relation to variations in supply and demand. Integration of Hydrogen from renewable and low carbon sources into the natural gas transmission system in order to align with the European Directives, Strategies and Agreements in force.		
Economic data:	Euro 7 million (+/- 30%, preliminary estimate at 2021 level)		
Project phase:	The project is under analysis, in the conceptual stage.		
TYNDP: HYD-N-647		PCI status:	
Project changes: new project			

9.5.2 Dedicated hydrogen transmission line development projects

9.5.2.1 Hydrogen transmission line in the Giurgiu-Podişor-Bibeşti-Jupa-Horia-Nădlac direction

Project name:	Hydrogen transmission line in the Giurgiu-Podişor-Bibeşti-Jupa-Horia-Nădlac direction	
Project number:	9.5.2.1	
Project holder:	SNTGN Transgaz SA 	
Project type:	Hydrogen transmission	
Estimated completion date	2030	
Project Objective:	It contributes to security of supply and diversification of energy sources in the countries involved. Diversified sources of H2 will be beneficial for hydrogen	

	prices and would allow a further reduction of greenhouse gas emissions by replacing fossil sources with hydrogen.
Project description: The project involves the construction of a new hydrogen pipeline along the Giurgiu - Podișor - Bibești - Jupa - Horia - Nădlac corridor. The project connects future hydrogen systems in Bulgaria, Romania and Hungary and enables the creation of the hydrogen market and cross-border hydrogen trade. The project will be part of the South East Europe Hydrogen Corridor (SEEHyC), which provides hydrogen deliveries on the route Greece>Bulgaria>Romania>Hungary>Slovakia>Czech Republic>Germany to the EU market and will also be available for reverse flow.	
Project justification:	In an integrated energy system, hydrogen supports the decarbonisation of industry, transport and energy production. The project is aligned with the EU strategy on decarbonisation by reducing CO2 emissions, while creating the possibility to connect to Europe's future hydrogen infrastructure.
Economic data:	Euro 2.263 million (+/- 30%, preliminary estimate at 2024 level)
Project phase:	The project is in the conceptual stage of analysis.
TYNDP: H2T-A-1014	PCI status:
Project changes: new project	

9.5.2.2 Hydrogen transmission line in the Black Sea - Podișor direction

Project name:	Hydrogen transmission line in the Black Sea - Podișor direction		
Project number:	9.5.2.2		
Project holder:	SNTGN Transgaz SA		
Project type:	Hydrogen transmission		
Estimated completion date	2030		
Project Objective:	It contributes to the security of supply and diversification of energy sources. Diversified sources of H2 will be beneficial for hydrogen prices and would allow a greater reduction in greenhouse gas emissions by replacing fossil sources with hydrogen.		
Project description: Given the significant potential for renewable energy production in the S-E area of Romania, the proposed project creates the necessary infrastructure to take over the potential for green hydrogen production in this area, including the hydrogen production already reported in the procedure for requesting non-binding capacity on hydrogen, carried out by SNTGN Transgaz SA in 2023. The green hydrogen capacity taken over by this project will be directed to the Giurgiu - Nădlac hydrogen corridor which is part of the SEEHyC Corridor.			
Project justification:	In an integrated energy system, hydrogen supports the decarbonisation of industry, transport and energy production. The project is aligned with the EU strategy on decarbonisation by reducing CO2 emissions, while creating the possibility to connect to Europe's future hydrogen infrastructure.		
Economic data:	Euro 1.073 million (+/- 30%, preliminary estimate at 2024 level)		
Project phase:	The project is under analysis, in the conceptual stage.		
TYNDP: H2T-N-1015		PCI status:	
Project changes: new project			

With financing from the European Investment Bank (EIB), SNTGN Transgaz SA has implemented the Climate and Decarbonisation Strategy. It includes a series of measures leading to the reduction of greenhouse gas emissions in order to achieve the decarbonisation targets set out in the Strategy for the short (2030), medium (2040) and long term (2050). The Strategy also includes the Investment Plan necessary to implement the measures related to the decarbonisation process.

Projects related to the Climate and Decarbonization Strategy of Transgaz

No.	Project	Deadline	Value -thousand lei-
1.	Decreasing energy consumption by energy monitoring of all facilities and implementation of energy efficiency actions on company assets/objectives	2028	46.697
2.	Active monitoring and detection of methane leak/emission sources (LDAR) at large NTS facilities/objectives (Natural Gas Compressor Stations, TN) by installing laser detection systems.	2030	16.600
3.	Reducing methane emissions by recovering purged gas at compressor stations	2035	15.000
4.	Reducing emissions by replacing natural gas fired heating solutions/processes with heat pumps/cogeneration.	2040	3.000
5.	Pilot project on the conversion of potential energy from natural gas to power at delivery stations where pressure drops and gas flow are high (expansion).	2030	5.000
6.	Adaptation of the gas-combustion systems equipping the existing gas turbines of compressor stations and gas heating boilers for operation with a mix of 20% hydrogen in the combustion gas. .	2050	Waiting for the technology to be finalized at compressor manufacturers
7.	Generation of renewable power by installing photovoltaic panel systems at company sites.	2030	6.908
8.	Expansion of natural gas recompression technology to limit purging during maintenance/repairs by purchasing specific equipment.	2027	30.000
9.	Replacement of existing diesel/gasoline vehicles with electric/hybrid vehicles.	2050	52.500
TOTAL			175.705

10. ANALYSIS OF MAJOR PROJECTS

I. Analysis of major gas transmission projects

10.1.1 Status of Projects

According to the Final Investment Decision (FID) in TYNDP 2015 projects were classified into two categories: FID-projects for which the final investment decision was taken and non-FID-projects for which the final investment decision was not taken.

In the TYNDP 2017 the basic non-FID status has been divided into subcategories:

- advanced non-FID (A non-FID);
- less advanced non-FID (LA non-FID).

According to this classification, the projects of the National Gas Transmission System Development Plan 2024-2033 are as follows:

No.	Project No. according to NTS TYNDP 2024-2033 updated 2025	Project	Project status
1	7.1	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	FID
2	7.2	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	A non FID
3	7.3	Development of the Black Sea - Podișor natural gas transmission pipeline in Romania	FID
4	7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	LA non FID
5	7.5	Romania-Serbia Interconnection	A non FID
6	7.6	Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania	LA non FID
7	7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	LA non FID*
8	7.8	Eastring-România	LA non FID
9	7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	LA non FID*
10	7.10	Development of the SCADA system for the National Gas Transmission System	FID
11	7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	LA non FID*

No.	Project No. according to NTS TYNDP 2024-2033 updated 2025	Project	Project status
12	7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	LA non FID*
13	7.13	Interconnection between NTS and the Black Sea LNG Terminal	LA non FID*
14	7.14	Black Sea LNG Terminal	LA non FID*

*Projects not included in TYNDP 2022

Table 4 - Status of Transgaz Major Projects for natural gas transmission

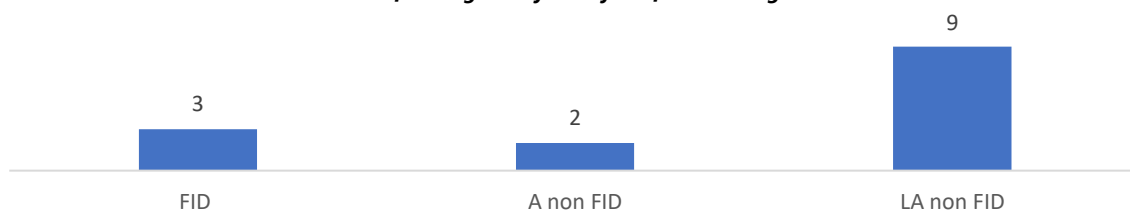


Chart 18 - Status of Major Gas Transmission Projects

Note

The following projects have been completed in relation to the previous versions of the National Gas Transmission System Development Plan (2021-2030 and 2022-2031):

- Development of the National Natural Gas Transmission System on the Bulgaria-Romania-Hungary-Austria Corridor in Romania - Phase I;
- The interconnection of the national gas transmission system with the international gas transmission pipeline T1 and reverse flow Isaccea;
- Upgrading GMS Isaccea 1;
- Developments of the NTS in the North-Eastern part of Romania in order to improve the natural gas supply of the area as well as to ensure transmission capacities to the Republic of Moldova;
- New NTS developments to take over gas from the Black Sea shore.

Project no.	Project name	Projects for which the open season procedure applies
7.5	Development of the transmission pipeline on the territory of Romania to take over natural gas from the Black Sea coast	x
7.6	Expansion of the National Gas Transmission System, part of the Vertical Corridor	x

Table 5 - Projects for which the Open Season procedure applies

10.1.2 Cost of Projects

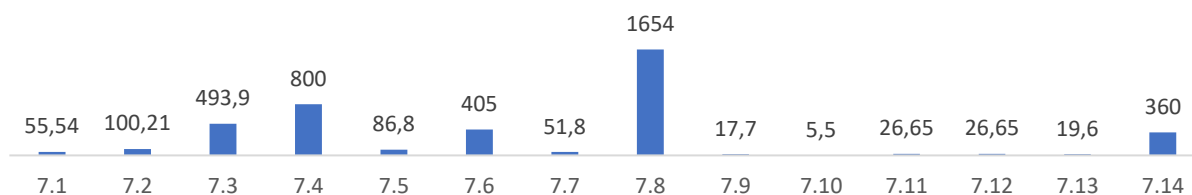


Chart 18 - Cost of major natural gas transmission projects (€ million)

The following is a summary of the major gas transmission projects:

No.	Project number	Project	Estimated amount mill. euro	Completion deadline	Importance of the project	Project status
1	7.1	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	55,54	2026	The expansion of the compressor stations Podișor and Bibești will ensure a constant gas supply for the Mintia, Ișalnița and Turceni power plants, as well as for other industrial facilities and Territorial Administrative Units, thus increasing the reliability of the region's energy system. The project will increase the gas capacity and pressure in order to ensure a constant and stable gas flow to industrial customers and power plants, and it will support the industrial development of the region by ensuring a constant gas flow, contributing to energy stability and increasing industrial competitiveness.	FID
2	7.2	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	100,21	2027	The expansion of the compressor station Jupa and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction will ensure the circulation of additional volumes and pressures needed in the system to supply consumers in the western part of the country, balance the gas transmission system in the western part of the country, increase the security of gas transmission to the Central European markets and the possibility of further development of the gas transmission/supply network in the region.	A non FID

No.	Project number	Project	Estimated amount mill. euro	Completion deadline	Importance of the project	Project status
3	7.3	Development on the territory of Romania of the natural gas Transmission Corridor from the Black Sea coast (Tuzla - Podișor).	493,9	2025	As Europe becomes increasingly dependent on natural gas imports, access to new sources is becoming an urgent necessity. This investment will allow gas from the Black Sea to enter the NTS and thus reach economic operators and households in the localities connected to the system. Moreover, this pipeline will connect to new sources of natural gas in the Transbalkan Corridor and the Vertical Corridor, of which the BRUA pipeline is a part, and will also be necessary for the transmission of gas coming to Romania from the Caspian Sea area, from LNG terminals in Türkiye and Greece.	FID
4	7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	800	2029	The phased increase of the transmission capacity to ensure the capacity levels proposed under the incremental capacity process, i.e. 4,38 bcm/year and 5,32 bcm/year, for gas transmission along the Vertical Corridor.	LA non FID
5	7.5	Romania-Serbia Interconnection	86,8	2028	Increasing the degree of interconnectivity between natural gas transmission systems in EU Member States and increasing energy security in the region.	A non FID
6	7.6	Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania	405	Stage 1 2027 Stage 2 2028 Stage 3 2029	Realization/modernization of some objectives related to the National Transmission System, in the North-West area of Romania, in order to create new natural gas transmission capacities or to increase existing capacities.	LA non FID
7	7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	51,8	2027	Improving natural gas supply to the area, ensuring energy security by diversifying natural gas transport sources and routes.	LA non FID
8	7.8	Eastring-Romania	Phase 1: 1.297 Phase 2: 357 million	Phase 1: 2028 Phase 2: 2033	EASTRING will be open to well-established as well as alternative sources. It will bring gas from new sources in the Caspian/Eastern Mediterranean/Black Sea/Middle	LA non FID

No.	Project number	Project	Estimated amount mill. euro	Completion deadline	Importance of the project	Project status
					East regions. At the same time, it will secure supplies to South-East Europe from European gas HUBs. The total capacity will be available to any transporter or supplier.	
9	7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	17,7	2027	The implementation of the SCADA system for cathodic protection will ensure durability and increased safety in the operation of transmission pipelines. Based on the acquired data, simplicity of operation will be ensured for a complex pipeline protection system.	LA non FID
10	7.10	Development of the SCADA system for the National Gas Transmission System	5,5	Phase 1 2025 Phase 2 and 3 2026	The upgrade of the natural gas transmission infrastructure must be supported in the coming years by the development of an efficient and flexible SCADA system, by modernizing the hardware and software architecture, by migrating to a decentralized architecture, with distributed control on administrative organizational units in accordance with the structure of SNTGN TRANSGAZ SA..	FID
11	7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	26,65	2028	Ensure reverse flow at the border with Ukraine and Bulgaria on the T2 transit pipeline.	LA non FID
12	7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	26,65	2028	Creating the possibility of reverse flow on the T3 pipeline, part of the Transbalkan corridor.	LA non FID
13	7.13	Interconnection between NTS and the Black Sea LNG Terminal	19,6	2028	Creating transmission capacity to take over natural gas from the LNG terminal on the Black Sea coast.	LA non FID
14	7.14	Black Sea LNG Terminal	360	2028	Ensuring security of gas supply from alternative sources.	LA non FID
TOTAL			EUR 4.103,35 million			

Total estimated value of FID projects:

No.	Project no.	Project	Value estimated mil. Euro	Deadline for completion	Importance of the project	Project status
1	7.1	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	55,54	2026	The expansion of the Podișor and Bibești compressor stations will ensure a constant gas supply for the Mintia, Ișalnița and Turceni power plants, as well as for other industrial facilities and Territorial Administrative Units, thus increasing the reliability of the region's energy system. The project will increase the gas capacity and pressure in order to ensure a constant and stable gas flow to industrial customers and power plants, and it will support the industrial development of the region by ensuring a constant gas flow, contributing to energy stability and increasing industrial competitiveness.	FID
2	7.3	Development on the territory of Romania of the natural gas Transmission Corridor from the Black Sea shore (Tuzla - Podișor).	493,9	2025	As Europe becomes increasingly dependent on natural gas imports, access to new sources is becoming an urgent necessity. This investment will allow gas from the Black Sea to enter the NTS and thus reach economic operators and households in the localities connected to the system. Moreover, this pipeline will connect to new sources of natural gas in the Transbalkan Corridor and the Vertical Corridor, of which the BRUA pipeline is a part, and will also be necessary for the transport of gas coming to Romania from the Caspian Sea area, from LNG terminals in Türkiye and Greece.	FID
3	7.10	Development of the SCADA system for the National Gas Transmission System	5,5	Stage 1 2025 Stage 2 and 3 2026	The implementation of the SCADA system for cathodic protection will ensure increased durability and safety in the operation of transmission pipelines. Based on the acquired data, simplicity of operation will be ensured for a complex pipeline protection system.	FID
TOTAL FID projects:			EUR 554,94 million			



Chart 20 - Investment effort for FID natural gas transmission projects by estimated time of completion (mil. Euro)

Estimated total value of A non FID projects:

No.	Project no.	Project	Value estimated mil. Euro	Completion deadline	Importance of the project	Project status
1	7.3	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	100,21	2027	The expansion of the Jupa compressor station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction will ensure the circulation of additional volumes and pressures needed in the system to supply consumers and balance the gas transmission system in the western part of the country, increase the security of gas transmission to the Central European markets and the possibility of further development of the gas transmission/supply network in the region.	A non FID
2	7.5	Romania-Serbia Interconnection	86,8	2028	Increasing the degree of interconnectivity between natural gas transmission systems in EU Member States and increasing energy security in the region.	A non FID
TOTAL projects A non FID			EUR 187,01 million			

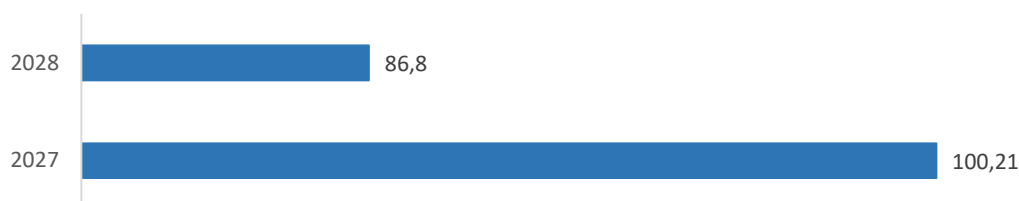


Chart 21 - Investment effort for A non FID natural gas transmission projects by estimated completion time (€ million)

Total estimated value of FID and A non FID projects:

Crt. no.	Status of projects	Total estimated value (€ million)
1	FID Projects	554,94
2	Projects A non FID	187,01
TOTAL FID and A non FID projects		EUR 741,95 million



Chart 19 - Investment effort for FID and A non FID natural gas transmission projects by estimated completion time (million Euro)

For the period 2024-2033, SNTGN Transgaz SA also proposes to carry out the following projects, which are currently at an early stage (**LA non FID**).

Total estimated value of LA non FID projects:

No.	Project no.	Project	Value estimated mil. Euro	Deadline for completion	Importance of the project	Project status
1	7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	800	2029	The phased increase of the transmission capacity to ensure the capacity levels proposed under the incremental capacity process, i.e. 4,38 bcm/year and 5,32 bcm/year, for gas transmission along the Vertical Corridor.	LA non FID
2	7.6	Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania	405	Stage 1 2027 Stage 2 2028 Stage 3 2029	Realization/modernization of some objectives related to the National Transmission System, in the North-West area of Romania, in order to create new natural gas transmission capacities or to increase existing capacities.	LA non FID
3	7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	51,8	2027	Improving natural gas supply to the area, ensuring energy security by diversifying natural gas transport sources and routes.	LA non FID
4	7.8	Eastring-Romania	Phase 1: 1.297 Phase 2: 357 million	Phase 1: 2028 Phase 2: 2033	EASTRING will be open to well-established as well as alternative sources. It will bring gas from new sources in the Caspian/Eastern Mediterranean/Black Sea/Middle East regions. At the same time, it will secure supplies to South-East Europe from European gas HUBs. The total capacity will be available to any transporter or supplier.	LA non FID

No.	Project no.	Project	Value estimated mil. Euro	Deadline for completion	Importance of the project	Project status
5	7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	17,7	2027	The implementation of the SCADA system for cathodic protection will ensure increased durability and safety in the operation of transmission pipelines. Based on the acquired data, simplicity of operation will be ensured for a complex pipeline protection system.	LA non FID
6	7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	26,65	2028	Ensure reverse flow at the border with Ukraine and Bulgaria on the T2 transit pipeline.	LA non FID
7	7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	26,65	2028	Creating the possibility of reverse flow on the T3 pipeline, part of the Transbalkan corridor.	LA non FID
8	7.13	Interconnection between NTS and the Black Sea LNG Terminal	19,6	2028	Creating transport capacity to take natural gas from the LNG terminal located on the Black Sea coast.	LA non FID
9	7.14	LNG Terminal	360	2028	Ensuring security of gas supply from alternative sources.	LA non FID
TOTAL non FID projects			EUR 3.361,4 million			

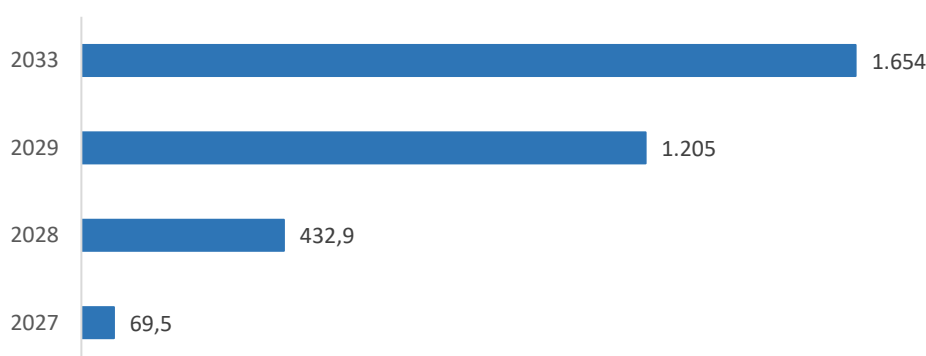


Chart 23 - Investment effort for LA non FID natural gas transmission projects by estimated time of completion (million Euro)

10.1.3 Planning the implementation of Transgaz's natural gas transmission projects for the period 2024-2033

Project name	Estimated present value (million Euro)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	55,54										
Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	100,21										
Development on the territory of Romania of the Transission Corridor for the takeover of natural gas from the Black Sea shore (Tuzla - Podișor)	493,9										
Expansion of the National Gas Transmission System, part of the Vertical Corridor	800*										
Romania-Serbia Interconnection	86,8										
Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania	405										
Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	51,8										
Eastring - Romania	1654										
Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	17,7										
Development of the SCADA system for the National Gas Transmission System	5,5										
Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	26,65										
Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling	26,65										

bidirectional flow on the T3 pipeline											
Interconnection between NTS and the Black Sea LNG Terminal	19,6										
Black Sea LNG terminal	360										

Table 6 - Planning of major natural gas transmission projects 2024-2033

10.1.4 Benefits of natural gas transmission projects

By linking different sources of natural gas supply to the European market, these investment projects contribute to the achievement of the European Union's goals, the main benefits of which can be summarised as follows:

- gas market integration and interoperability of natural gas transmission systems in the region;
- gas price convergence in the region;
- increasing the flexibility of the European gas transmission system by making interconnections in bi-directional flow;
- opening access for Romania and the European Union to a new source of natural gas - through the interconnection of the BULGARIA-ROMANIA-HUNGARY-AUSTRIA corridor with the Black Sea;
- increasing competition in the European gas market by diversifying sources, transmission routes and companies active in the region;
- increasing security of gas supply;
- stopping natural gas imports from Russia;
- boosting the development of renewable energy production in the region (especially wind and solar energy) in view of the possibility of using natural gas as a back-up for renewable energies, which leads to a significant increase in the sustainability of the proposed projects.

II. Analysis of major storage projects

10.11.1. Status of Projects according to the Final Investment Decision (FID):

Storage projects		TYNDP 2022	PCI (list V)	
8.1	Increasing the daily withdrawal capacity at the Bilciuresti Storage Facility - Upgrade of the natural gas storage system infrastructure - Bilciuresti	UGS - F - 311	6.20.7	FID
8.2	Increasing the underground natural gas storage capacity of the Ghercești storage facility	UGS - F - 398		FID
8.3	New underground gas storage facility in Fălticeni (Moldova)	UGS - N - 399		LA Non-FID
8.4	Increasing the underground natural gas storage capacity at the Sărmășel storage (Transilvania)	UGS- N - 371		A non FID
8.5	Modernization of natural gas storage infrastructure - Bălăceanca	UGS - N - 606		LA Non-FID
8.6	Retrofitting and development of the underground gas storage facility Târgu Mureș	UGS - A - 233	6.20.4	FID

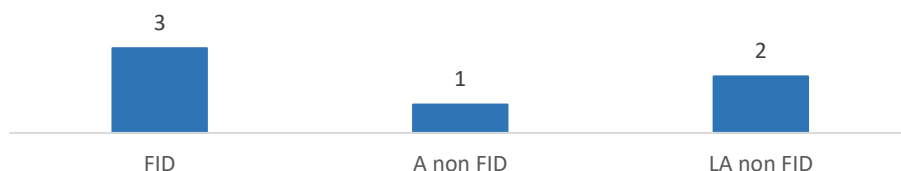


Chart 24- Status of major storage projects

10.II.2. Cost of major storage projects

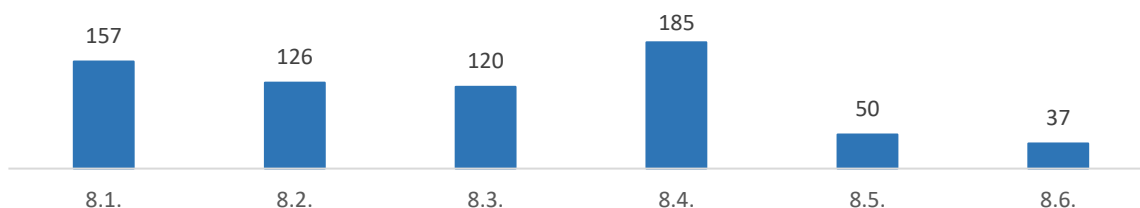


Chart 2520 - Estimated cost of major storage projects (€ million)

Project no.	Project	Value estimated mill. Euro	Completion deadline	Importance of the project	
8.1	Increasing the daily extraction capacity at the Bilciuresti Storage Facility - Modernization of the natural gas storage system infrastructure - Bilciuresti	157	2027	Increasing the daily delivery capacity of natural gas from the Bilciuresti storage to a flow rate of 20 mill cm/day and ensuring a higher degree of operational safety, coupled with an increase in storage capacity of 108 mill cm/cycle.	FID
8.2	Increasing the underground gas storage capacity of the Ghercești storage facility	126	2028	Increasing the daily delivery capacity of natural gas from the Ghercesti storage facility	FID
8.3	New underground gas storage facility at Fălticeni (Moldova)	120	2032	Increasing natural gas storage capacity to ensure security of natural gas supply	LA Non-FID
8.4	Increasing underground gas storage capacity at Sărmășel storage facility (Transylvania)	185	2030	Increasing natural gas storage capacity to ensure security of natural gas supply	A non FID
8.5	Upgrading of the natural gas storage infrastructure - Balaceanca	50	2032	Increasing the daily delivery capacity of natural gas from the Bălăceanca storage to 1,6 million m ³ /day.	LA Non-FID
8.6	Retrofitting and development of the underground gas storage facility Târgu Mureș	37 (Phase 1)	2026	Increasing daily injection/extraction capacity while increasing the useful volume of storage to ensure security of gas supply and the flexibility needed to better integrate national and regional energy markets	FID
TOTAL Storage projects		EUR 675 million			

Investment effort required to complete major storage projects according to completion deadlines:



Chart 26 - Investment effort for storage projects according to completion dates (million EUR)

As far as the projects *Modernization of the natural gas storage system infrastructure - Bilciuresti* (FID project) and *Storage Unit Depomures* (FID project) Transgaz is able to confirm that it has the necessary capacity to take over the related volumes, taking into account the prior discussions with Romgaz and Depomureş Târgu-Mureş.

10.II.3. Planning of storage projects for the period 2024-2033

Project name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Increasing the daily extraction capacity at the Bilciuresti Storage Facility - Upgrade of the natural gas storage system infrastructure - Bilciuresti											
Increasing the underground natural gas storage capacity of the Gherceşti storage facility											
New underground gas storage facility in Fălticeni											
Increasing underground natural gas storage capacity at the Sărmăşel storage facility (Transylvania)											
Modernization of natural gas storage infrastructure - Bălăceanca											
Refurbishment and development of the underground natural gas storage facility in Târgu Mureş											

III. Analysis of major hydrogen transmission projects

10.III.1 Status of projects

According to the Final Investment Decision (FID) in TYNDP 2015 projects were classified into two categories: FID-projects for which the final investment decision was taken and non-FID-projects for which the final investment decision was not taken.

In the TYNDP 2017 the basic non-FID status has been divided into subcategories:

- advanced non-FID (A non-FID);
- less advanced non-FID (LA non-FID).

According to this classification, the projects of the National Gas Transmission System Development Plan 2024-2033 updated 2025 are as follows:

No.	Project No. according to PDSNT 2024-2033 updated 2025	Project name	Status
1	9.5.1.1	Upgrade of the Isaccea - Jupa pipeline for hydrogen transmission	LA non FID
2	9.5.1.2	Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission	LA non FID
3	9.5.1.3	Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission	LA non FID
4	9.5.1.4	Upgrade of the Onești - Ungheni pipeline for hydrogen transmission	LA non FID
5	9.5.1.5	Upgrade of the Romania-Serbia interconnection for hydrogen transmission	LA non FID
6	9.5.1.6	Upgrade of the Coroi - Mediasu Aurit pipeline for hydrogen transmission	LA non FID
7	9.5.1.7	Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission	LA non FID
8	9.5.1.8	Upgrade of the Vadu - T1 pipeline for hydrogen transmission	LA non FID
9	9.5.2.1	Hydrogen transmission line in the Giurgiu-Podișor-Bibeuști-Jupa-Horia-Nădlac direction	LA non FID*
10	9.5.2.2	Hydrogen transmission line in the Black Sea - Podișor direction	LA non FID*

*Projects not included in TYNDP 2022

Table 7 - Status of Transgaz major projects for hydrogen transmission



Chart 27 - Status of Transgaz major hydrogen transmission projects

10.III.2 Cost of hydrogen transmission projects

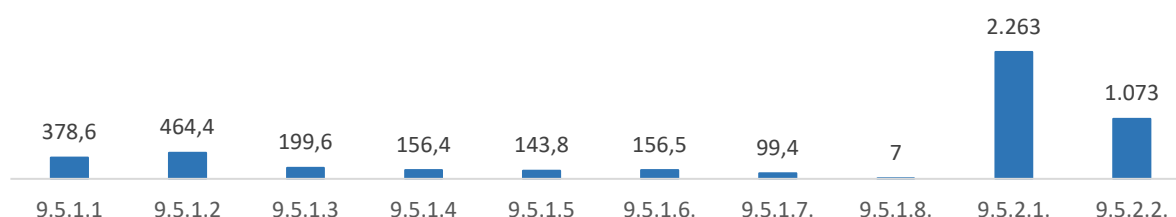


Chart 28 - Cost of major projects for hydrogen transmission (mil.Euro)

The following is a summary of the major projects for pure hydrogen transmission:

No.	Project no.	Project	Value estimated mil. Euro	Completion deadline	Importance of the project	Project status
1	9.5.1.1	Upgrade of the Isaccea - Jupa pipeline for hydrogen transmission	378,6	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
2	9.5.1.2	Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission	464,4	2042	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
3	9.5.1.3	Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission	199,6	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
4	9.5.1.4	Upgrade of the Onești - Ungheni pipeline for hydrogen transmission	156,4	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
5	9.5.1.5	Upgrade of the Romania-Serbia interconnection for hydrogen transmission	143,8	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
6	9.5.1.6	Upgrade of the Coroi - Mediasu Aurit pipeline for hydrogen transmission	156,5	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
7	9.5.1.7	Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission	99,4	2040	Repurposing of natural gas transmission infrastructure to transport hydrogen mixed with natural gas in accordance with European provisions.	LA non FID
8	9.5.1.8	Upgrade of the Vadu - T1 pipeline for hydrogen transmission	7	2040	Repurposing of the natural gas transport infrastructure for hydrogen transport in line with European provisions.	LA non FID
9	9.5.2.1	Hydrogen transmission line in the Giurgiu-Podișor-Bibeuști-Jupa-Horia-Nădlac direction	2263	2030	Repurposing the possibility of transporting hydrogen in accordance with European provisions.	LA non FID
10	9.5.2.2	Hydrogen transmission line in the Black Sea - Podișor direction	1073	2030	Repurposing the possibility of transporting hydrogen in accordance with European provisions.	LA non FID
TOTAL			EUR 4.941,7 million			

10.III.3 Planning the implementation of Transgaz's hydrogen transmission projects for 2024-2033

Project name	Estimated present value (million Euro)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Upgrade of the Isaccea - Jupa pipeline for hydrogen transmission											
Upgrade of the Giurgiu - Nădlac pipeline for hydrogen transmission											
Upgrade of the Black Sea - Podișor pipeline for hydrogen transmission											
Upgrade of the Onești - Ungheni pipeline for hydrogen transmission											
Upgrade of the Romania-Serbia interconnection for hydrogen transmission											
Upgrade of the Coroi - Mediasu Aurit pipeline for hydrogen transmission											
Upgrade of the Negru Voda - Isaccea pipeline for hydrogen transmission											
Upgrade of the Vadu - T1 pipeline for hydrogen transmission											
Hydrogen transmission line in the Giurgiu-Podișor-Bibeuști-Jupa-Horia-Nădlac direction											
Hydrogen transmission line in the Black Sea - Podișor direction											

Table 8 - Planning of Major Projects for pure hydrogen transmission 2024-2033

10.III.4 Benefits of hydrogen transmission projects

The use of hydrogen as an energy carrier is an essential element for sustainable development. However, there are many challenges to implementing the components of a hydrogen energy system. At European level, it is accepted that hydrogen in the energy sector is a solution that will solve a number of issues such as energy security, energy equity and environmental sustainability. By harmonising these elements, the basis for prosperity and competitiveness at national level is laid.

Romania's energy system, and therefore the gas sector, is undergoing a transformation. The European context will have an impact on them and hydrogen will be one of the important and integral components of the energy system. Hydrogen opens a new chapter in the energy transition, where its unique properties allow it to be used for carbon-free energy storage and distribution through all forms of use.

10.1 Comparison *ENTSOG TYNDP 2022 / Development Plan for the National Gas Transmission System 2024 – 2033 updated 2025*

No.	Project code Transgaz TYNDP	Transgaz TYNDP project name	Project code TYNDP2022	TYNDP 2022 project name
1.	7.1.	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	-	-
2.	7.2.	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Receaș-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	-	-
3.	7.3	Development on the Romanian territory of the Southern Corridor for taking over Black Sea shore gas (Tuzla – Podisor)	TRA-F-362	Development on the Romanian territory of the Southern Transmission Corridor
4.	7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	-	Further enlargement of the BG—RO—HU—AT transmission corridor (BRUA) phase 3
5.	7.5	Romania - Serbia Interconnection	TRA-A-1268	Romania-Serbia Interconnection
6.	7.6	Development/Upgrading of the gas transmission infrastructure in the North-Western part of Romania	TRA-N-598	NTS developments in North-East Romania
7.	7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	-	-
8.	7.8	Eastring-Romania	-	-
9.	7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	-	-
10.	7.10	Development of the SCADA system for the National Gas Transmission System	-	-
11.	7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	TRA-N-602	Upgrading GMS Isaccea 2 and GMS Negru Voda 2
12.	7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	-	-

No.	Project code Transgaz TYNDP	Transgaz TYNDP project name	Project code TYNDP2022	TYNDP 2022 project name
13.	7.13	Interconnection between NTS and the Black Sea LNG Terminal	-	-
14.	7.14	LNG Terminal	-	-
15.	9.5.1.1	Isaccea - Jupa corridor upgrading for hydrogen transmission	HYD-N-640	Isaccea - Jupa corridor upgrading for hydrogen transmission
16.	9.5.1.2	Giurgiu - Nădlac corridor upgrading for hydrogen transmission	HYD-N-999	Giurgiu - Nădlac corridor upgrading for hydrogen transmission
17.	9.5.1.3	Black Sea – Podișor Pipeline upgrading for hydrogen transmission	HYD-N-608	Black Sea – Podișor Pipeline upgrading for hydrogen transmission
18.	9.5.1.4	Onești – Ungheni corridor upgrading for hydrogen transmission	HYD-N-625	Onești – Ungheni corridor upgrading for hydrogen transmission
19.	9.5.1.5	Romania - Serbia Interconnection upgrading for hydrogen transmission	HYD-N-648	Romania - Serbia Interconnection upgrading for hydrogen transmission
20.	9.5.1.6	Coroi - Medieșu Aurit corridor upgrading for hydrogen transmission	HYD-N-730	Coroi - Medieșu Aurit corridor upgrading for hydrogen transmission
21.	9.5.1.7	Negru Voda – Isaccea corridor upgrading for hydrogen transmission	HYD-N-756	Negru Voda – Isaccea corridor upgrading for hydrogen transmission
22.	9.5.1.8	Vadu – T1 pipeline upgrading for hydrogen transmission	HYD-N-647	Vadu – T1 pipeline upgrading for hydrogen transmission
23.	9.5.2.1	Hydrogen transmission corridor in the Giurgiu-Podișor-Bibesci-Jupa-Horia-Nădlac direction	H2T-A-1014	-
24.	9.5.2.2	Hydrogen transmission corridor in the Black Sea - Podișor direction	H2T-N-1015	-
25.	8.1	Upgrading the gas storage system infrastructure - Bilciurești	UGS-F-311	Bilciurești daily withdrawal capacity increase
26.	8.2	Increasing the underground gas storage capacity of the Ghercești storage facility	USG-F-398	Ghercești Underground Gas Storage in Romania

No.	Project code Transgaz TYNDP	Transgaz TYNDP project name	Project code TYNDP2022	TYNDP 2022 project name
27.	8.3	New underground gas storage facility at Fălticeni (Moldova)	USG-N-399	New Underground Gas Storage at Falticeni
28.	8.4	Increasing underground gas storage capacity at Sărmășel storage facility (Transylvania)	USG-N-371	Sarmasel underground gas storage in Romania
29.	8.5	Upgrading of the natural gas storage infrastructure - Balaceanca	USG-N-606	Upgrading of the natural gas storage infrastructure - Balaceanca UGS
30.	8.6	Storage facility Depomures	USG-A-233	Depomures

Table 9 - TYNDP 2024 – 2033 updated 2025 / 2022 TYNDP code comparison

11. FINANCING OPTIONS

Every organization is required to adapt to the environment in which it operates, while maintaining its internal cohesion and minimizing the uncertainty that characterizes the transformations of the internal and external environment. To ensure that the organisation retains its identity as a result of its adaptation efforts, its development needs to be planned as carefully as possible and this plan needs to be reviewed regularly.

The moment when the decision to make an investment is made, regardless of its nature and scale, is of great importance in the life of the organization. The investment decision **is one of the most accountable managerial decisions because the investment targets the long-term strategic objectives of the company and its sustainable development.**

The financing for the implementation of the major projects for the development of the National Gas Transmission System in the period 2024 – 2033 are from:

- own sources;
- obtained sources.

The analysis of the financial resources considered only the necessary amounts for covering the FID project. The value of Transgaz's major FID projects for 2024-2033 estimated to EUR 554,94 million, 26% will be covered by equity, 59% by loans and 15% by grants.

SNTGN Transgaz SA endeavours, through sustained efforts, to obtain non-reimbursable financial assistance for the financing of investment projects with an impact on the modernization, upgrading and development of the NTS infrastructure, in order to obtain a financing mix that ensures the lowest cost in financing the development plan.

12. DO MINIMUM AND DO MAXIMUM SCENARIOS

The major projects were grouped by their status into two scenarios: *do minimum* (FID and A non FID projects) and *do maximum* (all of the projects). This classification is necessary for the environmental assessment purposes.

Variant 1 – DO MINIMUM

Project no.	Project name	Status
Gas transmission		
7.1.	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	FID
7.2	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TH Recaş-TH Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	A non FID
7.3	Development on the Romanian territory of the Transmission Corridor for taking over the Black Sea gas (Tuzla – Podisor)	FID
7.5	Romania – Serbia Interconnection	A non FID
7.10	Development of the SCADA system for the National Gas Transmission System	FID
Storage		
8.1	Upgrading of Bilciurești underground gas storage system infrastructure	FID
8.2	Increasing underground gas storage capacity at the Ghercești Underground Gas Storage Facility	FID
8.4	Increasing the storage capacity of the Sărmășel underground gas storage facility (Transylvania)	A non FID
8.6	Retrofitting and development of the underground gas storage facility Târgu Mureș	A non FID

Table 10 – List of major projects – Base scenario DO MINIMUM

Variant 2 – DO MAXIMUM

Project no.	Project name	Status
Gas transmission		
7.1.	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area	FID
7.2	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaş-TN Horia direction in order to increase the transmission capacity and security of gas supply in Western Romania	A non FID
7.3	Development on the Romanian territory of the Transmission Corridor for taking over the Black Sea gas (Tuzla – Podisor)	FID

Project no.	Project name	Status
Gas transmission		
7.4	Expansion of the National Gas Transmission System, part of the Vertical Corridor	LA non FID
7.5	Romania – Serbia Interconnection	A non FID
7.6	Development/Upgrading of the gas transmission infrastructure in the North-Western part of Romania	LA non FID
7.7	Increase in the gas transmission capacity of the interconnection Romania-Bulgaria, in the Giurgiu-Ruse direction	LA non FID
7.8	Eastring–Romania	LA non FID
7.9	Monitoring system, data control and acquisition for the cathodic protection stations related to the National Gas Transmission System	LA non FID
7.10	Development of the SCADA system for the National Gas Transmission System	FID
7.11	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline	LA non FID
7.12	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline	LA non FID
7.13	Interconnection between NTS and the Black Sea LNG Terminal	LA non FID
7.14	LNG Terminal	LA non FID
Hydrogen transmission		
9.5.1	Isaccea - Jupa corridor upgrading for hydrogen transmission	LA non FID
9.5.2	Giurgiu - Nădlac corridor upgrading for hydrogen transmission	LA non FID
9.5.3	Black Sea – Podișor Pipeline upgrading for hydrogen transmission	LA non FID
9.5.4	Onești – Ungheni corridor upgrading for hydrogen transmission	LA non FID
9.5.5	Romania - Serbia Interconnection upgrading for hydrogen transmission	LA non FID
9.5.6	Coroi - Medieșu Aurit corridor upgrading for hydrogen transmission	LA non FID
9.5.7	Negru Voda – Isaccea corridor upgrading for hydrogen transmission	LA non FID
9.5.8	Vadu – T1 pipeline upgrading for hydrogen transmission	LA non FID
9.5.9	Hydrogen transmission corridor in the Giurgiu-Podișor-Bibești-Jupa-Horia-Nădlac direction	LA non FID
9.5.10	Hydrogen transmission corridor in the Black Sea - Podișor direction	LA non FID
Storage		
8.1	Upgrading of Bilciurești underground gas storage system infrastructure	FID
8.2	Increasing underground gas storage capacity at the Ghercești Underground Gas Storage Facility	FID
8.3	New underground storage facility in Falticeni (Moldova)	LA non FID
8.4	Increasing the storage capacity of the Sărmășel underground gas storage facility (Transylvania)	A non FID
8.5	Upgrading of the natural gas storage infrastructure - Balaceanca	LA non FID
8.6	Retrofitting and development of the underground gas storage facility Târgu Mureș	FID

Table 11 - List of major projects – Base scenario DO MAXIMUM

13. 2025-2027 UPGRADING AND INVESTMENT PLAN FOR 2025-2027

No.	Type of work	2024	2025	2026	2027
1	UPGRADING AND RETROFITTING OF THE NATIONAL GAS TRANSMISSION SYSTEM				
1.1.	UPGRADING OF TECHNOLOGICAL INSTALLATIONS OF THE NATIONAL GAS TRANSMISSION SYSTEM (MRS, VCS, MP,NNT)				
1.1.1	ADAPTATION TO FIELD OF THE METERING LINES TO BE INSTALLED UNDER THE SCADA PROGRAMME AND TECHNOLOGICAL NODES AUTOMATIONS (Annex 1)				
1.2	DATA ACQUISITION CONTROL SYSTEM (Annex 2)				
2	DEZVOLTAREA SISTEMULUI DE TRANSPORT GAZE ȘI INSTALAȚII AFERENTE				
2.1.	DEVELOPMENT OF THE GAS TRANSMISSION SYSTEM AND RELATED FACILITIES				
1	Replacement of undercrossing of county road Bucharest Belt railway and Progresu railway of DN 700 Bucharest Ring gas transmission pipeline, Moara Domneasca- Măgurele section				
2	Securing DN 500 Filipești - Răzvad and DN 400 Filipești - Moreni gas transmission pipelines, undercrossing the Cricovul Dulce river, I.L. Caragiale area, Dâmbovița county				
3	Securing DN 500 Turcinești-Isalnita gas transmission pipeline at the abovecrossing of the Bradesti creek, Almaj area, Dolj county				
4	Securing DN 500 Posada-Bobolia gas transmission pipeline at the undercrossing of the Prahova River, Nistorești-Breaza area, Prahova county				
5	Securing abovecrossing of the Tarnava Mica river with DN200 Fantanele-Sovata gas transmission pipeline, Chibed area, Mures county				
6	Securing DN500 Hurezani-Corbu-București F1 and F2 gas transmission pipelines at the abovecrossing of the Amaraș creek, Stejari area, Gorj county				
7	Securing DN300 Stejari connection gas transmission pipeline near the Amaraș creek, Stejari area, Gorj county				
8	Securing DN 800 Butimanu - Brazi gas transmission pipeline at the undercrossing of the Prahova river, Stăncești area, Prahova county				
9	Deviation of gas transmission pipeline DN 800 Onesti-Han Domnesti and DN 500 Onesti-Adjudul Vechi gas transmission pipelines, Caiuti area, Bacau county				
10	Securing abovecrossing of the Valea Tarsei creek with DN 700 Platou Izvor Sinaia - Filipești gas transmission pipeline, Valea Tarsei, Prahova county				
11	Securing DN 350 Căței-Baia Mare gas transmission pipeline at the undercrossing of the Craica creek, Baia Mare area, Maramures area				
12	Protection of the transit pipelines undercrossing the Danube river in the area of the dike and the restoration of signalling				
13	Installing a control valve inside RS 2 Podisor		Cancelled		
14	Securing railway undercrossing in the Valea Mare Pravat area with the DN600 Mateiaș - Schitu Golesti gas transmission pipeline				
15	Securing undercrossing of the Siret river with the DN 500 Onești - Adjudul Vechi pipeline, Adjudul Vechi area, Vrancea county.				

No.	Type of work	2024	2025	2026	2027
16	Securing undercrossing of the Șușița creek with the DN 250 MRS Focșani connection gas transmission pipeline, Țifești area, Vrancea county				
17	Securing Corunca-Coroi-Sinca Bucharest 28"-24"-20" Platou Izvor Sinaia-Filipești gas transmission pipeline, Valea Târsei area, Prahova county, Ferma point				
18	Securing abovecrossing of the Târnava Mică river with the DN 200 Fântânele-Sovata gas transmission pipeline, Trei Sate area, Mures county				
19	Coupling abovecrossing of the Siret river to the DN 800 Han Domnesti-Tecuci gas transmission pipeline, Cosmesti area				
20	Securing DN400 Campina-Nedelea and DN 500 Posada-Bobolia gas transmission pipelines, Vrajitoarea area, Prahova county				
21	Securing DN 800 BRUA gas transmission pipeline, Jupânești area, Gorj county				
22	Replacement of DN 500 Moinești-Dărmănești gas transmission pipeline, Dărmăneasca-Dărmănești area, Bacău county				
23	Securing DN700 Platou Izvor Sinaia - Filipești gas transmission pipeline, Ghioșești Comarnic area, Prahova county				
24	Securing undercrossing of the Nisipoasa creek with the DN400 Govora-Drăgășani gas transmission pipeline, Scăioși area, Vâlcea county				
25	Securing DN700 Platou Sinaia - Filipești gas transmission pipeline, Talea - Breaza area, Prahova county				
26	Securing DN 350 Cășei - Baia Mare gas transmission pipeline section at the undercrossing of the Bloaja creek, Cernești area, Maramureș county				
27	Securing DN 700 Moghioroș-Onești and DN 800 Moghioroș-Onești gas transmission pipelines, Ferăstrău area, Bacău county				
28	Securing 20" Drăgușeni - Spătăreni gas transmission pipeline, Drăgușeni area, Suceava county				
29	Securing DN 300 Satu-Mare-Baia-Mare gas transmission pipeline section at the undercrossing of the Ilba creek, Ilba area, Maramures county				
30	Securing undercrossing of the Ampoi river with the DN 200 Alba Iulia-Zlatna gas transmission pipeline, Presaca Ampoiului area, Alba county				
31	Enabling bidirectional gas flow on T3 at GMS Isaccea 4				
32	Enabling bidirectional gas flow on T3 at GMS Negru Voda 3				
33	Securing DN 300 Simeria - MRS Hunedoara I gas transmission pipeline, Bârcea Mică and Peștișu Mare areas, Hunedoara county				
34	Securing abovecrossing of the Plapcea river with the DN 100 supply connection MRS Scornicești at GMS, Olt county				
35	Securing DN 300 Sibiu - Cisdădie pipeline at the abovecrossing of the Argintului creek, MRS Transilvania Automobile area, Sibiu county				
36	Securing the undercrossing of the Cibin river with the DN 400 gas transmission pipeline at the limit of Alba - Sibiu counties, Orlat area, Sibiu county				
37	Connection of MRS Seuca at the DN 600 Coroi-Masloc gas transmission pipeline (West 2)				
38	Securing abovecrossing of the Aries river with the DN 500 Ozd - Campia Turzii gas transmission pipeline, Luncani area, Cluj county				

No.	Type of work	2024	2025	2026	2027
39	Securing DN 500 Posada-Bobolia gas transmission pipeline (river left) at the undercrossing of the Prahova river, Comarnic area, Prahova county				
40	Adaptation to field and installation of pig receiving trap DN 700 on the DN 700 Bucharest Ring gas transmission pipeline				
41	Securing DN 700 Tăuții Măgherauș-Ulmeni gas transmission pipeline at the underscossing of the Lăpuș river, Bușag area, Maramureș county				
42	Securing DN 500 Schitu Golesti-Govora-Dragasani gas transmission pipeline, undercrossing of the Topolog river, Tigveni area, Arges county				
43	Securing DN 500 Schitul Golesti-Govora gas transmission pipeline, Slanic area, Arges county				
44	Securing DN 700 Moghioroși - Onești and DN 800 Moghioroși - Onești pipelines, Hârja (Pisotaia) area, Oituz, Bacău county				
45	Securing DN 500 Schitu Golesti - Pitesti - Corbu (Line 2) gas transmission pipeline, Pitesti area				
46	Modernization of the connection pipeline and MRS Vladimirescu, Vladimirescu, Arad county				
47	Securing DN 300 Agârbiciu - Sibiu pipeline, Șeica Mare area				
48	Securing DN 80 supply connection Ucea de Jos pipeline and adaptation to field MRS Ucea de Jos				
49	Securing DN500 Schitu Golesti-Tigveni gas transmission pipeline at the abovecrossing of Valea Danului creek, Valea Danului area, Arges county				
50	Securing DN 500 Corbu-Turnu Măgurele F2 gas transmission pipeline at the undercrossing of the Vedea river, Icoana area, Olt county				
51	Installation of a gas flow metering system at GMS Negru Voda Transit 1 (flow computers, supervisory system and transducers)				
52	Interconnection of DN 800 Crevedia - Podișor gas transmission pipeline with DN 400 Gura Șuții - Bucharest pipeline, Slobozia Moară area, Dâmbovița county				
53	Replacement of Botoșani - Bucecea pipeline section, Baisa village area, Botoșani county				
54	Securing abovecrossing of the Ghimbașel river with the DN 700 Paltin-Gura Diham - Mediaș regional office section gas transmission pipeline, Râșnov Site, Brașov county				
55	Securing abovecrossing of the Palos creek with the DN300 Beia-Hoghiz gas transmission pipeline, CPS Palos area, Brasov county				
56	Securing DN 300 gas transmission pipeline Piatra Neamt bypass, Valeni area, and installation of gas pressure regulation equipment, Savinesti area, Neamt county				
57	Securing abovecrossing of the Racovița creek and Moașa creek with the DN 200/150mm MRS Turnu Roșu connection gas transmission pipeline, Racovița and Sebeșul de Sus areas, Sibiu county				
58	Securing DN 80 - MRS Bisericani gas supply connection gas transmission pipeline, Schit Bisericani area, Neamț county				
59	MRS Timișoara I – MRS Timișoara III gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
60	DN 500 Plătărești - Bălăceanca gas transmission pipeline				
61	Câmpulung Moldovenesc-Vatra Dornei- Pojorâta-Vatra Dornei section gas transmission pipeline				

No.	Type of work	2024	2025	2026	2027
62	Arinis - Oarta de Jos gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
63	Techirghiol - Ovidiu gas transmission pipeline				
64	28" Gănești - Botorca transmission pipeline and interconnections between 28" Coroi - Ganesti and 28" Band - Idrifaia pipelines, and 24" Coroi - Botorca - Bacia (West II) pipeline, Bahnea and Gănești area				
65	Râmnicu Vâlcea - Tetila gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
66	Ghercești - Jitaru gas transmission pipeline				
67	Securing DN800 Onesti-Han Domnesti and DN 500 Onesti Adjutul Vechi gas transmission pipelines, Stefan cel Mare area				
68	MRS Craiova 1 and connection pipeline, including field enclosure				
69	Securing abovecrossing of the Târnava Mare river with the DN 700 Seleuș - Hetiur - Iașu gas transmission pipeline, Secuieni area, Harghita county				
70	Installation of pig trap DN 500 on the Munteni - Barlad pipeline				
71	Additional transmission capacity between the DN 400 Vintu - Sibiu and DN 500 Lunca - Sibiu gas transmission pipelines				
72	Securin abovecrossing of the Valea Morii creek with the DN 150 MRS connection Danes pipeline, MRS Danes area, PT, Mures county				
73	Securing undercrossing of the Siret river with the DN 350 Tisauti - Bucecea gas transmission pipeline, Siminicea area, PT, Suceava county				
74	Securing undercrossing of the Targului river with the Dn 500 Schitu Golesti - Slatioarele gas transmission pipeline and with the DN 150 MRS Mihaesti gas supply connection pipeline, Mihaesti area, Arges county				
75	Securing Dn 300 Tazlau - Savinesti gas transmission pipeline, Nechit area, Neamt county				
76	Securing Dn 200 MRS Buciumeni connection pipeline gas transmission pipeline, Dambovita county				
77	Securing Dn 500 Carpinis - Fieni gas transmission pipeline, TAU Moroieni area, Dambovita county				
78	Securing abovecrossing of the Filipea creek with the Dn 500 Helegiu - Racova gas transmission pipeline, line F1, Livezi area				
79	Securing abovecrossing of the Mures river with the Dn 600 Band - Ganesti - Botorca - Bacia (West III) pipeline, Sanmarghita area, Mures county				
80	Securing abovecrossing of the Olt river with the Dn 600 Barcut - CS Sinca pipeline, Fagaras area, Brasov county				
81	Securing Dn 500 Schitu Golesti - Tigveni, in zona Deal Carbune gas transmission pipeline, Arges county				
82	Securing Dn 800 BRUA pipeline, Hurezani - Totea area, Gorj county				
83	Securing Dn 500 Onesti - Adjutul Vechi gas transmission pipeline located at the undercrossing of the Trotus river, Urechesi area				
84	Securing Dn 500 Posada-Bobolia gas transmission pipeline at the undercrossing of the Prahova river, Silistre area, Prahova county				
85	Securing gas transmission pipeline Fantanele-Bistrita DN150 (Line 1) and DN250 (Line 2) gas transmission pipelines at the undercrossing of the Sieu river, Crainimat area, Bistrita-Nasaud county				

No.	Type of work	2024	2025	2026	2027
86	Securing undercrossing of the Provita river with the DN 700 Platou Sinaia - Filipești gas transmission pipeline, Provita de Sus area, Prahova county				
87	Securing abovecrossing of the Nadișa creek with the DN 500 Helegiu-Racova gas transmission pipeline, lines F1 and F2, Enachesti area, Bacau county				
88	Securing DN200 MRS Cornu connection pipeline at the abovecrossing of the Prahova river, Cornu area				
89	Securing DN500 Schitu Golesti - Govora - Dragasani pipeline, Doamnei river, Domnești area				
90	Installation of pig receiving strap and gas regulation installation at the Cruce point on the DN 500 Ișalnița-Panou 402-Cruce pipeline, Dolj county				
91	Development-Upgrading of the gas transmission infrastructure in the North-Western part of Romania				
92	Upgrading GMS Isaccea 2 and GMS Negru Voda 2 for enabling bidirectional flow on the T2 pipeline				
93	Upgrading GMS Isaccea 3 and GMS Negru Voda 3 for enabling bidirectional flow on the T3 pipeline				
94	Interconnection between NTS and the Black Sea LNG Terminal				
95	Black Sea LNG Terminal				
2.2	INCREASING NTS TRANSMISSION CAPACITY				
1	DN 600 Gas transmission pipeline Mihai Bravu – Silistea and transformation into a piggable pipeline. Danube undercrossing Măcin arm				
2	DN 600 Gas transmission pipeline Mihai Bravu – Silistea and transformation into a piggable pipeline. Danube undercrossing Borcea arm				
3	Development on the Romanian territory of the Southern Transmission Corridor for taking over the Black Sea gas (Black Sea - Podișor)				
4	CS Vințu upgrading				
5	Gas transmission pipeline to supply Mintia Plant (including power supply, cathodic protection and optical fibre)				
6	Mihai Bravu - Siliștea (without Danube)				
7.1	Expansion of the Jupa Compressor Station and the construction of the gas transmission pipeline in the TN Recaș-TN Horia direction in order to increase the transmission capacities and the security in the NTS for gas supply to the Western area of Romania				
7.2	Procurement of the centrifugal compressor for the: Expansion of the Podișor Compressor Station in order to increase the transmission capacities in the NTS for gas supply to the Mintia, Ișalnița and Turceni power plants, including the Territorial Administrative Units and other industrial consumers in the area				
7.3	Expansion of the Podișor and Bibești Compressor Stations in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni combined cycle power plants, including the territorial administrative units and other industrial consumers in the area				
7.4	Procurement of the centrifugal compressor for the: Expansion of the Bibești Compressor Station in order to increase the transmission capacity in the NTS for gas supply to the Mintia, Ișalnița and Turceni power plants,				

No.	Type of work	2024	2025	2026	2027
	including the Territorial Administrative Units and other industrial consumers in the area				
7.5	Procurement of centrifugal compressor for: Expansion of the Jupa Compressor Station in order to increase the transmission capacity and security of gas supply in Western Romania				
8	DN 500 Horia - Borş gas transmission pipeline				
9	Dn 800 Bordoşiu - Coroi gas transmission pipeline ((including power supply, cathodic protection and optical fibre)				
10	CS Coroi				
11	Increasing the transmission capacity of the NTS and the security of gas supply of the Electrocentrale Işalniţa Branch (Dolj county) and the Electrocentrale Turceni Branch (Gorj county)				
11.1	TN Hurezani - Bibeşti - TN Turburea gas transmission pipeline, Gorj county				
11.2	Țânțăreni - Turceni gas transmission pipeline, Gorj county				
11.3	CCGT Işalniţa connection pipeline, Dolj county				
12	DN 700 Săușa-Târgu Mureş gas transmission pipeline				
13	Securing undercrossing of the Gilort river with the DN500 Turcineşti-Işalniţa gas transmission pipeline, Turburea-Aninoasa area, Gorj county				
14	Orlat-Gura Râului gas transmission pipeline				
15	Expansion of the National Gas Transmission System, part of the Vertical Corridor (former BRUA phase III)				
16	Interconnection between the National Gas Transmission System of Romania and the similar gas transmission system of the Republic of Serbia (including power supply, cathodic protection and optical fibre)				
17	Transformation of the Dn 700 Isaccea - Sendreni pipeline into a piggable pipeline DALI+PT				
18	Mihaileni - Lunca de Sus gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
19	Procurement of centrifugal compressor Vintu				
2.3	ABOVEGROUND CONSTRUCTION AND INSTALLATION WORKS FOR MRS (Annex 3)				
2.4	CATHODIC PROTECTION STATIONS (Annex 4)				
2.5	ABOVEGROUND INSTALLATION AND CONSTRUCTION WORKS FOR ODORIZATION INSTALLATIONS (Annex 5)				
2.6	WORKS AT GAS TRANSMISSION PIPELINES LOCATING IN RISK-BEARING AREAS (Annex 6)				
3	ELECTRICAL INSTALLATIONS AND NETWORKS				
4	LAND PROCUREMENT				
5	NTS ACCESS WORKS				
6	NTS DEVELOPMENT ACCORDING TO LAW 123/2012 (UPDATED) ART 130, AL. E¹ AND E²				
1	Tg. Neamţ - Baltateşti gas transmission pipeline, Neamţ county				
2	Deta - Moravita gas transmission pipeline, Timis county				
3	Bentu gas transmission pipeline, Siliştea Bucureşti-Cotu Ciorii gas transmission pipeline				

No.	Type of work	2024	2025	2026	2027
4	Prunișor - Orșova - Baile Herculane - Jupa gas transmission pipeline				
4.1	Prunișor - Orșova - Baile Herculane - Jupa - LOT 1 gas transmission pipeline				
4.2	Prunișor - Orșova - Baile Herculane - Jupa - LOT 2 gas transmission pipeline				
4.3	Prunișor - Orșova - Baile Herculane - Jupa - LOT 3 gas transmission pipeline				
4.4	Prunișor - Orșova - Baile Herculane - Jupa - LOT 4 gas transmission pipeline				
5	Vernești - Măracineni - Poșta Câlnău gas transmission pipeline, Buzău county, Stage II = Măracineni - Poșta Câlnău				
6	Ghergheasa - Focșani gas transmission pipeline				
7	Lugasu – Huedin gas transmission pipeline				
8	Vladimirescu - Lipova gas transmission pipeline				
9	Segarcea - Bailesti - Calafat gas transmission pipeline				
10	Runc - Borsec gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
11	Gas supply to the localities in the Moinesti - Asau and Mihaileni-Lunca de Sus consumption directions, located in the ADI Trotus Gaz Palanca area, Bacau and Harghita counties				
12	Gas supply to the localities in the Scanteia – Deleni and Petresti - Costuleni consumption directions, located in the ADI PLAIURILE JIJIEI area, Iasi county				
13	Gas supply to the Praid, Lupeni, Corund and Atid localities, located in the ADI GORDON TARNAVA area, Harghita county				
14	Potential NTS investment projects, depending on requests, the results of the technical and economic studies and the completion of the FEEDs.				
15	Radauti-Horodnic de Jos-Vicovu de Sus gas transmission pipeline (including power supply, cathodic protection and optical fibre)				
16	Gas transmission pipeline in the Barbuncesti-Magura-Patarlagele direction (including power supply, cathodic protection and optical fibre)				
17	Coșula-Săveni-Dărăbani gas transmission pipeline				
18	Bucecea-Dărăbani gas transmission pipeline				
19	Blandești-Trușești-Dornești-Ștefănești gas transmission pipeline				
20	Gas transmission pipeline in the Petelea-Alunis direction, Mureș county (including power supply, cathodic protection and optical fibre)				

IDMP – Annex 1 –ADAPTATION TO FIELD OF THE METERING LINES TO BE INSTALLED BY THE PROGRAMME SCADA AND TECHNOLOGICAL NODE AUTOMATIONS

No.	Type of work	2024	2025	2026	2027
1	Racova Technological Node - power supply for actuation and automation components				
2	Power supply to vital consumers TN Podisor				
3	Mounting of regulating valve for Corbu-Turnu Magurele subsystem supply from TN Corbu				

No.	Type of work	2024	2025	2026	2027
4	Mounting of regulating valve at TN Hurezani on the Hurezani-Corbu-Bucuresti direction, pigable pipeline				
5	Power supply for actuation and automation components at TN Munteni- power line and transformer station				
6	Mounting of DN600/ANSI40 pig receiving station at TN RECAS				
7	Upgrading of TN Lazaresti - Power supply to actuation, automation and supervision components				
8	Upgrading of TN Jugureanu, including power supply to the facility, as well as to the actuation and automation components, county of Brăila				
9	Power supply to actuation, automation and supervision components at the TN Dealul Frumos				
10	Power supply to the 0.4 kV Gănești TN				
11	Upgrading of the Cornești TN, including automation of the facility				
12	Sendreni TN - Rehabilitation of construction elements, mechanical installation, and upgrading of power supply, automation, burglar alarm, video surveillance, and fire alarm systems				
13	Land consolidation and fence extension at Sarmasel TN Fence restoration, access roads, landscaping, and land consolidation at Sarmasel TN				
14	Modernization of Masloc TN (land stabilization)				
15	Increasing the energy efficiency of TN Sendreni				
16	Upgrading of MONITORED STATIONS				

IDMP – Annex 2 – DATA ACQUISITION CONTROL SYSTEM

No.	Type of work	2024	2025	2026	2027
1	Upgrade of central hardware and software infrastructure - servers and SCADA operator stations				
2	Interconnection, control and monitoring of BRUA SCADA system				
3	Interconnection, control and monitoring of NE Moldova SCADA system.				
4	Interconnection, control and monitoring of the Tuzla-Podișor SCADA system				
5	SADZ system - Implementation of PTZ4 volume converter pressure value alarm system				
6	Interconnect industrial communication solution				
7	Upgrading of automation and SCADA system GMS Negru Voda T1				
8	Upgrading of automation and SCADA system TN URZICENI				
9	Upgrading of automation and SCADA system TN AFUMATI				
10	Upgrading of automation and SCADA system TN MANESTI				
11	Upgrading of automation and SCADA system TN CORBU				
12	Upgrading of automation and SCADA system TN COROI				

IDMP – Annex 3 – ABOVE-GROUND CONSTRUCTION AND INSTALLATION WORKS FOR METERING-REGULATING STATIONS

No.	Type of work	2024	2025	2026	2027
1	Power supply and indoor electrical installations at MRS Marpod				
2	MRS Moinesti I (Dealul Mare) connection to NTS and to the gas distribution system				
3	Site preparation for MRS Colibași - SRM execution, Argeș County				
4	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Șona - Mediaș Regional Office				
5	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Crăciunelu de Jos - Mediaș Regional Office				
6	Power supply and indoor electrical installations at MRS Filiasi				
7	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Moara Iacobeni - Cluj Regional Office				
8	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Sausa - Cluj Regional Office				
9	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Chetani – Cluj Regional Office				
10	Power supply - voltaic panels solution and installations for electricity use at MRS SDE Belciugatele				
	Land preparation for MRDS Băbeni				
11	Atmospheric discharge protection system, with lightning rod and restoration of electrical installation for use for MRS Fulger Bragadiru facility				
12	Upgrading of MRS Sighisoara				
13	Power supply and indoor power installations at the MRS Ighisul Nou				
14	Power supply at MRS Lechinta				
15	Replacement of technological installation in MRS Dulcești, Neamț county				
16	Power supply and indoor electrical installations at MRS Foieni, Satu Mare county				
17	Power supply MRS Marsa				
18	Power supply MRS Grindeni				
19	Upgrading of distribution system at MRS Bistrita				
20	Power supply and indoor electrical installations at MRS Vestem				
21	Power supply and indoor electrical installations at MRS Cenade				
22	Power supply and indoor electrical installations at MRS Șelimbăr				
23	Power supply and indoor electrical installations at MRS Mohu				
24	Relocation of master power switchboard at MRS Ion Neculce, Iași county				
25	Upgrading and replacement of technological installations at MRS Miercurea Ciuc				
26	Upgrading of technological installation MRDS Arad I				

No.	Type of work	2024	2025	2026	2027
27	Relocation and adaptation to field of the technological installation of MRS Poroterom Orastie on the MRS Baru site				
28	Replacement of MRS Măgurele Bucharest				
29	Adaptation to field of MRS Falticeni, Suceava county				
30	Access road MRDS Arad I technological installation upgrading				
31	Connection and MRDS Craiova Sud, Dolj county				
32	Upgrading of MRS Pascani II				
33	Upgrading of MRS Onesti, Bacău county				
34	Power supply and interior electrical installations at MRS Daia				
35	Installation of photovoltaic panels for the power generation for self-consumption at Transgaz facilities				
36	Adaptation to field of MRS Bârlad, Vaslui county				
37	Adaptation to field of MRS Vaslui, Vaslui county				
38	Adaptation to field of MRS Colibași - Demolition of operator building, upgrading of MRS Colibasi and fencing				
39	Lightning protection system, with lightning rod and grounding system to protect the mechanical and electrical installations belonging to the MRS Saes facility - Medias Regional Office				
40	MRS Craiova South - Podari, connection to the National Gas Transmission System, and to the natural gas distribution system				
41	Pipeline for connecting the gas distribution system for MRS Craiova, Dolj county				
42	Replacement of the filtration - separation system at MRS Reșița, Caraș-Severin County				
43	Replacement of the filtration-separation installation MRS Galați, Galați town, Galați county				
44	Replacement of the lightning protection system with a lightning rod and improvement of the grounding installation for the protection of mechanical and electrical installations belonging to the MRS CIC Tg.Mures facility - Medias Regional Office				
45	Replacement of MRS Fantanele technological installation, Arad County				
46	Lightning protection system, with lightning rod and grounding installation to protect the mechanical and electrical installations belonging to the MRS Rora Sighișoara facility - Mediaș Regional Office				
47	Lightning protection system, with lightning rod and grounding system to protect mechanical and electrical installations belonging to the MRS Mediaș III facility - Mediaș Regional Office				
48	Power supply 0.4 kV to MRS Giarmata Vii, Timiș County				
49	Installation of gas heating system at MRS Tulcea Alum				
50	MRS Jijila - Macin - Systematization of the technological installation by completing it with appropriate elements/equipment				
51	Power supply to MRS Luna				
52	Fence restoration at MRS Noul Sasesc				
53	Upgrading of MRS 16 Februarie Bucharest				
54	Relocation of gas-powered generator from MRS Filiasi to MRS Slatina				

No.	Type of work	2024	2025	2026	2027
55	Lightning protection system with lightning rod and grounding system for the protection of mechanical and electrical installations belonging to the MRS Valea Lungă facility - Mediaș Regional Office				
56	Lightning protection system with lightning rod and grounding system for the protection of mechanical and electrical installations belonging to the MRS Alămor facility - Mediaș Regional Office				
57	Lightning protection system with lightning rod and grounding system for the protection of mechanical and electrical installations belonging to the MRS Bogatu Român facility - Mediaș Regional Office				
58	Lightning protection system with lightning rod and grounding system for the protection of mechanical and electrical installations belonging to the MRS Păuca facility - Mediaș Regional Office				

IDMP – Annex 4 – **CATHODIC PROTECTION STATIONS**

No.	Type of work	2024	2025	2026	2027
1	Cathodic protection on DN250 pipeline gas supply connection to MRS Oarja, Arges county				
2	Cathodic protection on DN 500 transmission pipeline PM402 Simnic-Pielesti				
3	Relocation of cathodic protection station Bradu 8 5/8" Arges county				
4	Cathodic protection station Șercaia, Brașov county				
5	Cathodic protection of DN400 pipeline gas supply connection MRS Vaslui				
6	Cathodic protection on DN400 gas transmission pipeline MRS Alprom Slatina connection, Olt county				
7	Monitoring, control, and data acquisition system for cathodic protection stations related to the National Gas Transmission System				
8	Cathodic protection station on the Dn 100/150 Bentu - Galbinasi gas transmission pipeline, Galbinasi TAU area, Buzău county				
9	Relocation of the Crăciunel 3 Cathodic Protection Station				
10	Improvement of cathodic protection on the Cornățel - Avrig pipeline				
11	Mănești cathodic protection station (Coadă Izvorului)				
	Florești cathodic protection station, Prahova county				

IDMP – Annex 5 – **ABOVEGROUD INSTALLATION AND CONSTRUCTION WORKS FOR ODORIZATION**

No.	Type of work	2024	2025	2026	2027
1.	Adaptation to field of the odorization installations				

IDMP – Annex 6 – **WORKS AT GAS TRANSMISSION PIPELINES LOCATED IN RISK-BEARING AREAS**

No.	Type of work	2024	2025	2026	2027
1.	WORKS FOR SECURING Ø20" HATEG - DEALUL BABII - PAROSENI GAS TRANSMISSION PIPELINE, Dealul Babii area, Hunedoara county				
2.	SECURING Ø 10" FRASIN – SPĂTĂREȘTI GAS TRANSMISSION PIPELINE, Spătărești area				
3.	WORKS FOR SECURING MRS RĂCĂCIUNI GAS SUPPLY CONNECTON PIPELINE, Dumbrava tourist halt area				
4.	DN 500 SARMASEL - BAIA MARE - SATU MARE GAS TRANSMISSION PIPELINE, Sucutard area				
5.	SECURING DN 350 LUNA - AIUD, DN250 LUNA – OCNA MUREȘ (Line I) and DN250 LUNA -OCNA MUREȘ (Line II) GAS TRANSMISSION PIPELINES, Razboieni area				
6.	SECURING DN 300 CORMENIS-APA GAS TRANSMISSION PIPELINE, Buciumi area				
7.	SECURING DN 300 Agârbiciu – Sibiu pipeline, Șeica Mare area				

Note: The 2024-2026 Investment Development and Modernization Plan was approved based on Boar of Administration Resolution 36/19 December 2023 as amended.

	Works completed.
	Works which were not completed in the year estimated initially and are in progress.
	Works according to the initial estimation.

Within the PMDI for 2025 and estimates for the period 2026-2027, investments in NTS developments were included in accordance with Electricity and Gas Law 123/2012, as amended, investments to ensure the expansion of the National Transmission System in areas with newly established distribution systems.

Estimated values for the development of the transmission network in Romania are contained in the PMDI in the chapters **NTS ACCESS WORKS** and **NATIONAL TRANSMISSION SYSTEM DEVELOPMENT IN ACCORDANCE WITH LAW 123/2012 (UPDATED), ART.130 (E¹) and (E²), as follows:**

- Thousand lei -

	REB 2025	Estimated 2026	Estimated 2027
NTS access works	76.746	57.908	9.319
NTS development in line with Law 123/2012	171.392	289.086	92.820
TOTAL	248.138	346.994	102.139

The amounts included in the NTS Development Plan 2024-2033 updated 2025 on the extension and NTS development ensures the possibility to connect the NTS to all the localities in Romania, in line with the provisions of Electricity and Gas Law 123/2012, on, as amended, and ANRE Order 82/2017.

14. CONCLUSIONS

Romania seeks to become an energy turntable in Eastern Europe, both from the perspective of achieving a gas transmission network strongly interconnected with similar gas transmission networks in the region, and from the perspective of gas supplying.

The three major directions of action in order for Romania to gain this position are presented in the **Energy Deal**, namely:

- the interconnection of the gas and electricity networks and the creation of the physical and institutional infrastructures necessary to operate a liquid energy market;
- the development of new internal gas sources and the integration on the regional power markets;
- the consistency with the European energy policies, boosting the negotiation ability in the EU institutions and cooperating with other member states in sustaining common strategic objectives.

With its important resources and opportunities offered by the geographical positioning, Romania can secure for itself a high degree of energy security and regional integration, can ensure a high degree of energy security and regional integration, and the energy sector can become a real "economic growth driver".

The cross-border interconnection of networks is nowadays a priority in the Romanian energy policy.

Any development scenario for gas and electric energy production, or for the diversification of the external sources on import, needs a **proper transmission infrastructure**. In order to ensure the compliance with the requirements of the European Union policy in the energy sector, based on three fundamental objectives: **energy security, sustainable development and competitiveness**, **Transgaz** established in its administration plan the increasing of the level of NTS reliability to ensure the interoperability with the neighbouring systems, the development, upgrading and modernization of the gas transmission infrastructure, the improvement of the efficiency and the interconnection with the gas transmission systems of the neighbouring countries.

By achieving the objectives set in the **TYNDP 2024-2033, updated 2025 Transgaz** aims to become a leader in the energy sector, an important gas transmission operator on the international gas market, with a national gas transmission system that is modern, intelligent, integrated at the European level and with a modern management system, in line with the international performance standards and regulations.

Given the important dependence of the European energy market on the Russian and Middle East energy imports, the discovered gas reserves in the Black Sea play a crucial role in terms of the Romanian energy security, the consolidation of Romania's position as an important player in the EU as a producer and exporter of energy, the integration of the country on the major gas transmission European routes and the increase in the country's economic welfare for the future decades.

Aware of this responsibility, Transgaz' management is continuing one of the largest and most important plans for the development of the Romanian gas transmission infrastructure over the last 20 years, with investment projects estimated at approximately Euro 9 billion (of which

Euro 741,95 million for FID and A non-FID projects) and meant to create gas transmission routes, essential to efficient transmitting of the discovered Black Sea gas on the internal and regional markets, but also in order to have Romania integrated into the major cross-border routes of the European South-Eastern/North-South Corridor.

The capability of the company to adapt and to respond to the requirements of the Romanian gas resources, in the following years, is one of the biggest challenges for a Romanian company (not only state - owned) over the last two decades.

The ability of the company to implement this investment plan will not only ensure the use of essential economic resources for the welfare of Romania but it will also be a litmus test to prove the foreign investors that Romania is able to create favourable conditions for developing and attracting foreign investments.

**ION STERIAN
DIRECTOR-GENERAL**

Definitions and abbreviations

ENTSO-G	European Network of Transmission System Operators for Gas
TYNDP	Ten Year Network Development Plan
CE	The European Commission
CEF-Energie	Connecting Europe Facility
CESEC	Central East South Europe Gas Connectivity
ROHUAT/BRUA	Cluster phased capacity increase on the Bulgaria — Romania — Hungary — Austria bidirectional transmission corridor
NSI-EAST	North South Corridor - East
PCI	Projects of Common Interest
POIM	Large Infrastructure Operational Program
AP	Priority Axis (POIM)
OS	Strategic Objective (POIM)
TANAP	The Trans-Anatolian Pipeline (TANAP);
TAP	The Trans Adriatic Pipeline
IGB	The Interconnector Greece – Bulgaria
AGRI	The Azerbaijan-Georgia-Romania-Hungary interconnector
BRUA	The Bulgaria – Romania – Hungary – Austria pipeline
SNTGN	The National Gas Transmission Company
ANRE	National Energy Regulatory Authority
ANRM	National Agency of Mineral Resources
BVB	Bucharest Stock Exchange
NTS	National Gas Transmission System
MRS	Gas metering regulating station
SCV	Valve control station
NT	Technological Node
SMG	International transmission pipeline metering station
SCG, SC	Gas compressor station
SPC	Cathodic protection station
SOG	Gas odorization station
SCADA	Supervisory control and data acquisition system
BG	Bulgaria
UA	Ukraine
HU	Hungary
RO	Romania
DN	Nominal Diameter
L	Length
Pn	Nominal pressure

List of figures, charts and tables

FIGURES

Figure 1 - Map of the territorial organisation of SNTGN Transgaz SA.....	10
Figure 2 – Map of the National Gas Transmission System and the capacities at the cross-border interconnection points (bScm/year).....	11
Figure 3 – Schematic representation of the Romanian gas market.....	13
Figure 4 - Lengths of natural gas transmission systems of neighbouring countries	17
Figure 5 - Major NTS projects map	39
Figure 6 - Major natural gas storage projects – Depogaz.....	58
Figure 7 - Major natural gas storage projects – Depomures.....	65
Figure 8 - Proposed "backbone" of the NTS for hydrogen transport,	70

CHARTS

Chart 1 - Evolution of transported natural gas including gas for underground storage and NTS gas consumption for the period 2014-2024.....	8
Chart 2 - The share of the NTS gas consumption in the total transmitted gas including gas for underground storage for the period 2014-2024.....	8
Chart 3 - Forecasts of the transmitted gas quantities including underground storage gas for the period 2025-2033	9
Chart 4 – Transgaz's shareholding structure as at 31 December 2023.....	9
Chart 5 -The gas consumption in the Romanian market in the period 2015–2024 (GWh).....	27
Chart 6- Seasonal gas consumption in the period 2015-2024 (TWh)	27
Chart 7 – The domestic gas production depending on the main producers	29
Chart 8 – The gas supply sources in the period 2015-2024.....	29
Chart 9 – ROMGAZ natural gas production forecast for the period 2025–2033.....	30
Chart 10 – Black Sea Oil and Gas natural gas production forecast for the period 2025–2033	30
Chart 11 – OMV Petrom natural gas production forecast for the period 2025–2033.....	30
Chart 12 – Neptun Deep natural gas production forecast for the period 2025–2033	31
Chart 13– Natural gas production forecast 2025-2033 according to natural gas producers.....	31
Chart 14 – Capacities booked in the period 2014-2024	33
Chart 15- - The hydrogen production by technology type in tonnes for the period	68
Chart 16 - The Hydrogen consumption by industry, expressed in average percentages, by.....	68
Chart 17- Summary of the estimated consumption of renewable and reduced footprint hydrogen.....	69
Chart 18 - Cost of major natural gas transmission projects (€ million)	81
Chart 19 - Investment effort for A non FID natural gas transmission projects by estimated completion time (€ million)	85
Chart 20 - Investment effort for FID and A non FID natural gas transmission projects by estimated completion time (million Euro)	86
Chart 21 - Investment effort for LA non FID natural gas transmission projects by estimated time of completion (million Euro)	87
Chart 22 - Status of major storage projects	90
Chart 23 - Estimated cost of major storage projects (€ million).....	90
Chart 24 - Investment effort for storage projects according to completion dates (million EUR).....	91
Chart 25 - Status of Transgaz major hydrogen transmission projects.....	92
Chart 26 - Cost of major projects for hydrogen transmission (mil.Euro)	93

TABLES

Table 1 - PEAK and maximum consumption 14 days.....	28
Table 2 - Gas import points.....	37
Table 3- Forecasts for the N-1 value for 2025-2033.....	37
Table 4 - Status of Transgaz Major Projects for natural gas transmission.....	80
Table 5 - Projects for which the Open Season procedure applies.....	80
Table 6 - Planning of major natural gas transmission projects 2024-2033.....	89
Table 7 - Status of Transgaz major projects for hydrogen transmission.....	92
Table 8 - Planning of Major Projects for pure hydrogen transmission 2024-2033.....	94
Table 9 - TYNDP 2024 – 2033 updated 2025 / 2022 TYNDP code comparison.....	97
Table 10 – List of major projects – Base scenario DO MINIMUM	98
Table 11 - List of major projects – Base scenario DO MAXIMUM.....	99