

2024 - 2033 TEN-YEAR NETWORK DEVELOPMENT PLAN OF BULGARTRANGAZ EAD

April 2024

**Approved by Decision under Minutes No. 802/22.04.2024 of a meeting of
Bulgartransgaz EAD's Management Board**



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DEFINITIONS AND ABBREVIATIONS

The following definitions and abbreviations are used for the purposes of this document:

AGRS – Automatic Gas Regulation Station

BEH – Bulgarian Energy Holding EAD

GDP – Gross Domestic Product

VGC– Vertical Gas Corridor

VTP – Virtual Trading Point

Gas infrastructure of Bulgartransgaz EAD - gas transmission network infrastructure and underground gas storage in Chiren (Chiren UGS), connected to it

BGH - Balkan Gas Hub EAD

GMS – Gas Metering Station

GPB – Gas Pipeline Branch

GRS – Gas Regulation Station

the Company – Bulgartransgaz EAD is an independent combined gas operator in Bulgaria

EBRD – European Bank for Reconstruction and Development

ENTSOG – European Network of Transmission System Operators for Gas

ECHA – European Clean Hydrogen Alliance

EHB – European Hydrogen Backbone

ENNOH – European Network of Network Operators for Hydrogen

EU - European Union

EWRC – Energy and Water Regulatory Commission (formerly SEWRC)

VA – Valve Assembly

EEC – End Energy Consumption

CS – Compressor Station

ME - Ministry of Energy

MPa – Megapascal (unit of pressure)

MRDPW – Ministry of Regional Development and Public Works

CEF – Connecting Europe Facility

m³ or cubic meter – unit of volume which in this document for the purposes of determining a natural gas quantity, represents the natural gas quantity in a volume of one cubic meter at 293.15 K (200C) and absolute pressure of 0.101325 MPa.

EIA – Environmental Impact Assessment

PF – Pigging Facility

PEC– Primary Energy Consumption

UGS – Underground Gas Storage

PCI – Project of Common Interest

Natural Gas Transmission – transport of natural gas through the gas transmission networks owned by Bulgartransgaz EAD

CIW – Construction and Installation Works

TAP – Trans-Adriatic Pipeline

TANAP– Trans-Anatolian Natural Gas Pipeline

CESEC - Central and South Eastern Europe Energy Connectivity - initiative for energy connectivity in Central, Eastern and Southeast Europe;

LNG – Liquefied Natural Gas

SEEGAS – Memorandum of Understanding on cross-border cooperation on the development of an integrated natural gas market in South-Eastern and Eastern Europe

W – Watt (unit of power)

INTRODUCTION

Bulgartransgaz EAD Ten-year plan for development of the natural gas transmission and storage infrastructure has been prepared pursuant to Art. 81 (d), para. 1 of the Energy Act (EA). The Plan is prepared for the period 2024-2033 and sets out the vision for development of the company as an independent transmission operator and storage facility operator. It is consistent with the main European, regional and national priorities, namely increasing the security of natural gas supply, ensuring diversification of natural gas supply sources and routes, permanent establishment of sustainable, liberalized and interconnected gas market, and it is in line with climate and environmental policies of Europe.

The priority activities for development of Bulgartransgaz EAD infrastructure in the period 2024 – 2033 are aimed at rehabilitation, modernization and expansion of the existing main and auxiliary gas transmission infrastructure and its auxiliary equipment and facilities, development of interconnectivity and expansion of storage capacity. Their implementation will strengthen the important role of Bulgaria in the region, contribute to the development of gasification in the country, as well as to the gradual decarbonisation of its energy and economy.

Hydrogen projects are essential for construction of new hydrogen infrastructure and assessment for subsequent retrofitting of the existing infrastructure to ensure its adaptation to hydrogen and hydrogen-gas mixtures transport.

TYNDP major objective is to ensure maximum transparency for the future Company development prospects and project ideas. It identifies and analyzes the trends and factors determining the necessity of planned investments, as well as their allocation over time. Thus, market participants are provided with information and supported in making long-term investment decisions.

The implementation of the investment strategy presented in this Plan will provide additional opportunities to increase natural gas use in the country with the respective economic, social and environmental benefits, and diversify gas supply sources and routes. It will promote the establishment of a competitive natural gas market, increase supply and provide wider choice to its participants. This, in turn, would provide price incentives as a basis of a liquid natural gas market.

Having regard to achieving full transparency and balance between the interests of the TSO and the market participants, the TYNDP is subject to public consultation based on which the interrelations between the Company's projects and the development plans of the stakeholders can be considered and synchronized in the TYNDP.

The national TYNDPs serve as a basis for development of the Gas Regional Investment Plans (GRIPs), as well as the Community-wide Network Development Plan, developed by the European Network of Transmission System Operators for Gas (ENTSOG).

BULGARTRANSGAZ EAD PROFILE



Compressor Station Nova Provadia

Bulgartransgaz EAD is a sole owner joint stock company, registered on 15 January 2007 by Decision of Sofia City Court. The owner of 100% of its shares is Bulgarian Energy Holding EAD with principal the Ministry of Energy.

By virtue of Decision of the Energy and Water Regulatory Commission, Bulgartransgaz EAD is certified independent transmission operator in Bulgaria in line with the requirements of Directive 2009/73/EC concerning the common rules for the internal market in natural gas, Regulation (EC) No 715/2009 on the conditions for access to the natural gas transmission networks and Chapter Eight, (a) of the Energy Act. The Decision was adopted in line with the opinion of the European Commission of 22 April 2015.

A Decision approved by EWRC confirms that Bulgartransgaz EAD meets the criteria for certification and the requirements for independence, namely:

- The Management Board of the independent transmission operator is the competent authority responsible for decisions, related to TSO current activity, the management of the network and the activities, required for preparing TYNDP;
- The Independent Transmission Operator has the right to make independent decisions regarding the assets, required for the operation, maintenance and development of the transmission network and the gas regimes control;
- The requirements for professional independence of the members of the Management Board and the members of the Supervisory Board of Bulgartransgaz EAD have been met;
- Bulgartransgaz EAD has at its disposal the necessary resources including human, technical, financial and physical, required to meet its obligations when carrying out



the natural gas transport and storage activity;

- The company has its own corporate identity, independent IT systems and equipment, independent premises and security access systems thereto, as well as its own external contractors or external consultants for the access to these systems;
- When carrying out its activity, the Independent Transmission Operator provides services that are non-discriminatory for the different network users and does not restrict, distort or prevent competition in production or gas supply.

Bulgartransgaz EAD is a combined gas operator performing natural gas transmission and storage activities. The company is the owner and operator of the gas transmission network infrastructure and the underground gas storage Chiren (Chiren UGS) connected to it.

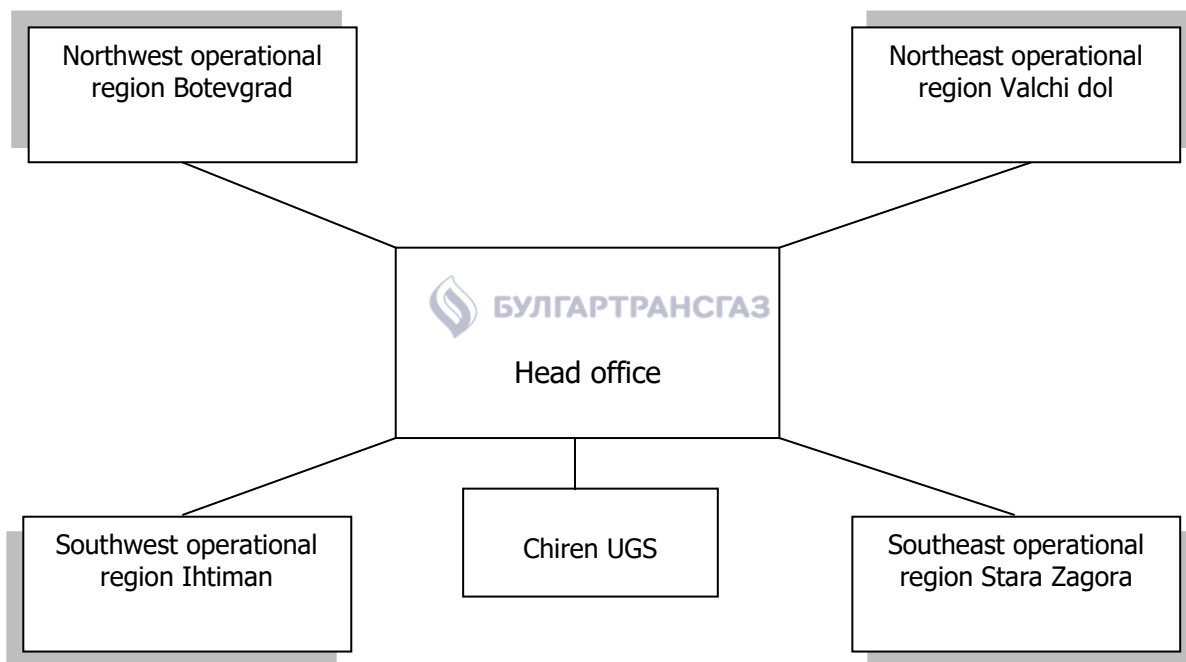
The Company is holder of the following licenses, issued by the Energy and Water Regulatory Commission (EWRC):

- For natural gas transmission: Licenses No L-214-06 and No L-214-09 of 29.11.2006
- For natural gas storage: License No L-214-10 of 29.11.2006

The basic requirements for these activities are regulated by the Energy Act and the by-laws, harmonized with the European legislation in that field.

Bulgartransgaz EAD plays a key role and is responsible for the uniform management, reliable operation and efficient use of the natural gas transmission system, including the gas pipelines, compressor stations and Chiren UGS. The activities include natural gas transmission in compliance with the requirements for gas quality and metering, networks development in accordance with the long-term gas sector forecasts and plans for gas supply and the gas sector development, as well as maintenance, operation, management and development of Chiren UGS. All these services are provided to the users on a level playing field. Apart from that, engineering, investment and service activities are carried out in the Company.

The organisational structure of the Company includes a Head office and four operational regions - Northwest operational region Botevgrad, Northeast operational region Valchi dol, Southeast operational region Stara Zagora, Southwest operational region Ihtiman, responsible for the operational control and maintenance of the network on the respective territory, as well as Chiren UGS.



Since its establishment, Bulgartransgaz EAD constantly strives to improve the quality of the offered services, while promoting and fostering gas market development in Bulgaria. The company makes investments aimed at increasing reliability and development of the natural gas transmission and storage infrastructure. Bulgartransgaz EAD pursues a policy of transparency, non-discrimination and operates in full compliance with the requirements of the applicable European and Bulgarian legislation.

DESCRIPTION OF NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE



Compressor Station Ihtiman

Gas infrastructure, owned by Bulgartransgaz EAD on the territory of the Republic of Bulgaria consisting of gas transmission network infrastructure and an underground gas storage facility in Chiren (Chiren UGS), connected to it.

Gas transmission network infrastructure provides natural gas transport to users in the country, as well as to the neighbouring countries Türkiye, Greece, Serbia, Romania and North Macedonia. It comprises of 3 443 km gas pipelines and gas pipeline branches, as well as eleven compressor stations – CS Kardam 1, CS Kardam-2, CS Valchi Dol, CS Polski Senovets, CS Rasovo, CS Provadia, CS Nova Provadia, CS Lozenets, CS Strandzha, CS Ihtiman and CS Petrich, with approximate total installed capacity of 374 MW, electrochemical protection system, pigging facilities, communication system, information system and other auxiliary facilities.

The Underground Gas Storage Chiren has 24 exploitation wells and a compressor station of approximately 9 MW total installed capacity. The present storage capacity can provide storage of up to 5,813,500 MWh of natural gas. The withdrawal and injection capacity, according to the formation pressures and other factors, is between 5 354 MWh/d up to 41 228 MWh/d (0.5 to 3.85 mcm/d at 10.71 MWh/1000 m³) for withdrawal and 5 354 MWh/d up to 40 907 MWh/d (0.5 to 3.82 mcm/d at 10.71 MWh/1000 m³) for injection. In an emergency situation, the maximum withdrawal capacity is up to 50 330 MWh/d (4.7 mcm/d at 10.71 MWh/1000 m³) in case of full gas storage facility and for a short time period (no more than 30 days).

The main entry and exit points of the Company gas transmission network are the

following:

Interconnection point (IP) Negru Voda 1/Kardam – connection between Bulgartransgaz EAD gas transmission system and the gas transmission system operated by Transgaz S.A. (Romania) on the Bulgarian-Romanian border in the area of the village of Kardam, General Toshevo Municipality;

Interconnection point (IP) Negru Voda 2, 3/Kardam – connection between Bulgartransgaz EAD gas transmission system and the gas transmission system operated by Transgaz S.A. (Romania) on the Bulgarian-Romanian border in the area of the village of Kardam, General Toshevo Municipality;

Interconnection point (IP) Kulata/Sidirokastro – connection between Bulgartransgaz EAD gas transmission network for transit transmission and the gas transmission system operated by DESFA S.A. (Greece), located on the Bulgarian-Greek border in the area of Kulata village, Petrich Municipality;

Interconnection point (IP) Strandzha/Malkoclar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by BOTAS (Türkiye), located on the Bulgarian-Turkish border in the area of the village of Strandzha, Bolyarovo Municipality;

Interconnection point (IP) Strandzha 2/Malkoclar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TAGTAS (Türkiye), located on the Bulgarian-Turkish border in the area of the village of Strandzha, Bolyarovo Municipality;

Interconnection point (IP) Kireevo/Zaycar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by Gastrans (Serbia), located on the Bulgarian-Serbian border in the area of the village of Kireevo, Makresh Municipality;

Interconnection point (IP) Kyustendil/Zhidilovo – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by Nomagas AD (former GA-MA, Macedonia), located on the Bulgarian-Macedonian border in the area of the village of Guyeshevo, Kyustendil Municipality.

Interconnection point (IP) Ruse/Giurgiu – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TRANSGAZ S.A. (Romania) on the Bulgarian-Romanian border in the area of the village of Marten, Ruse Municipality;

Interconnection point (IP) Stara Zagora – connection between Bulgartransgaz EAD gas transmission network and the gas pipeline (IGB) operated by ICGB AD (Bulgaria), located in the area of the village of Zagore, Stara Zagora Municipality;

Interconnection point (IP) Kalotina/Dimitrovgrad – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by Srbijagas (Serbia), located on the Bulgarian-Serbian border in the area of the village of Kalotina, Dragoman Municipality;

GMS Galata – an entry point from local production of the gas transmission network;

GMS Dolni Dabnik – an entry point from local production of the national gas transmission network;

Entry-exit point GMS Chiren – connection between the gas transmission network and Chiren UGS.



Compressor Station Lozenets

1. NATURAL GAS MARKET IN BULGARIA

1.1. General Market Overview

Bulgartransgaz EAD implements a consistent and targeted policy to improve connectivity with neighbouring countries by establishing new interconnection points with significant capacity and maximizing capacity at existing points.

The existing and planned gas infrastructure provide an opportunity for diversification of natural gas supplies both to Bulgaria and to the other countries in the region of Southeast Europe.

1.1.1. Natural gas consumption

Natural gas consumption in Bulgaria for 2023 was 26 303 GWh, which shows 7 % decrease compared to the consumption in 2022 (28 203 GWh). The decrease can be considered temporary and is due to the mild meteorological conditions over the winter, the instability of natural gas prices worldwide, the measures taken to limit consumption in the EU under the REPowerEU plan and Regulation (EU) 2022/1369 and the consequences of the COVID-19 pandemic and the war in Ukraine. In 2024 and the subsequent years, a gradual stabilisation of the natural gas market and a return to positive consumption growth rates are expected.

According to data of NSI Overall Energy Balance for 2022, natural gas had a share of 11.9% in primary energy consumption and 12.7% in final consumption of fuels and energy.

The natural gas share in the country's energy balance continues to be lower compared the

average values of the EU countries but it has a potential for a significant and steady growth considering the evolving gasification and the natural gas role as a transition fuel for a low carbon economy.

1.1.2. Main natural gas sources

The consumption of natural gas in Bulgaria is mostly ensured by pipeline gas imports from Azerbaijan and liquefied natural gas from terminals in the region. Local production in the country remains low. In 2023, about 0.2% of natural gas consumption was provided by local production from the Galata field. The share of natural gas imports in Bulgaria last year was 99.8%.

Bulgartransgaz EAD works actively and consistently to improve the interconnection by increasing the technical transmission capacities at interconnection points to provide opportunities for gas supplies from various sources, including LNG.

In recent years, significant investments were made for rehabilitation, modernization and expansion of the Bulgarian gas transmission network, which improved the interconnectivity level, efficiency, reliability and flexibility of the transmission system.

The commissioning of the Gas Interconnection Bulgaria - Serbia (IBS) in 2023 provided Bulgaria with an access along a new route to the liquefied natural gas terminal in Croatia and the largest liquid market and storage in Central Europe - Baumgarten in Austria, and Serbia - to the liquefied gas terminals in the region.

Thanks to the investments and cooperation with the gas transmission operators from the region, significant transmission capacities to and from Bulgartransgaz EAD system have been secured at the borders with all neighbouring countries. The transmission capacity is unidirectional only on the border with the Republic of North Macedonia where the IP Kyustendil/Zhidilovoonly is the only entry point for natural gas supplies.

These projects contribute to the diversification of the supply sources, the provision of a secure access to additional gas quantities from the Central and South-Eastern Europe region and the establishment of a liquid, integrated and interconnected natural gas market at European level.

Bulgartransgaz EAD manages its gas transmission infrastructure as a single system with one balance zone, respectively one Virtual Trading Point (VTT). The availability of a single balancing zone and a single VTP provides the opportunity to network users and gas traders to work with a single balancing portfolio, thus avoiding the risks of generating positive imbalances in one balancing zone and negative in the other one.

In 2022 and 2023, the natural gas quantities by sources of supply were as follows:

No	Type of supply	2022		2023	
		Quantity, GWh	Relative share	Quantity, GWh	Relative share
1	Imported natural gas according to entry interconnection points	28,132	99.7%	26,246	99.8%
2	Natural gas locally produced	71	0.3%	57	0.2%
TOTAL		28,203	100.0%	26,303	100.0%

Imports from various sources of supply of pipeline gas and LNG for the country and the region are emerging as a permanent trend that will continue to grow.

The REPowerEU plan to reduce the European Union's dependence on Russian fossil fuels and accelerate the clean energy transition necessitates an increase in pipeline gas from the Caspian region and LNG from alternative sources such as the US, Qatar, Egypt, Norway, Algeria, Nigeria, etc. to European countries. LNG terminals will continue to play a key role in diversifying the sources and enhancing the European gas security.

1.1.3. Main natural gas consumers and market participants

The main participants on the gas market in Bulgaria are the following:

- Bulgartransgaz EAD – a combined gas operator licensed to perform natural gas transmission and storage activities;
- ICGB AD - an independent natural gas transmission operator, licensed to transport natural gas;
- Bulgargaz EAD – public supplier of natural gas in Bulgaria responsible for ensuring natural gas supply to end suppliers and to persons holders of a license for heat production and transmission, at prices and conditions approved by the EWRC;
- Natural gas traders – make transaction for natural gas supply with the public supplier, end suppliers, customers, other natural gas traders, production companies, natural gas storage companies and the combined operator;
- Balkan Gas Hub EAD and Bulgarian Energy Trading Platform AD - operators of trading platforms, ensuring trading environment for an organized natural gas exchange market on a bilateral principle;
- Gas distribution companies – performing both natural gas supply from end gas supplier and natural gas distribution activities, supply natural gas to customers connected to their networks. It is their obligation to construct and develop the gas distribution networks according to the long-term business plans and conditions approved by EWRC;
- Non-household natural gas customers connected to the gas transmission networks;
- Household and non-household natural gas customers connected to the gas distribution networks.

Production companies and two main groups of customers - gas distribution companies and non-household users are connected to Bulgartransgaz EAD gas transmission network.

The main users of natural gas transmission services in the country are the public supplier Bulgargaz EAD, trade companies from the Energy and Chemistry sectors, end suppliers, as well as other users of the gas transmission network and natural gas traders.

The "natural gas distribution" and "natural gas supply" activities by end suppliers to customers connected to the distribution networks are being carried out by regional and local gas distribution companies, operating in licence regime and price regulation conditions. Overgas Mrezhi AD, followed by Aresgas AD, Citigas Bulgaria EAD and others have the largest market share.

At the end of 2023 on the territory of the Republic of Bulgaria 25 licensed gas distribution

companies operate in 36 licensed territories, covering 174 municipalities, representing 65% of all municipalities in the country.

The share of household gas supply in the country is still low compared to the EU countries, but tends to increase continuously. At the national level, programmes are being implemented to promote household gasification; the development of natural gas distribution infrastructure continues.

The total number of customers of the gas distribution companies as of 31.12.2023 is 157 995, of which 8 439 non-household and 149 556 household customers. The number of customers has grown by 3.7% in one year - from 152,383 in 2022 to 157,995 in 2023. Household customers have increased by 3.8% and non-household - by 2.3%.

Activities aimed at increase of the degree of liberalization, liquidity and diversification of the national gas market are at a different stage of implementation.

Balkan Gas Hub EAD (BGH) trading platform started its operations at the end of 2019, and as of February 2024, 93 participating companies have been registered.

The main objective of BGH activity is to establish a liquid, transparent, reliable, stable and single regional gas market, in full compliance with the Bulgarian, as well as the European energy and financial regulations. The company holds license No.L-532-11 of 25.03.2021 for carrying out the activity "organization of natural gas exchange market". In addition, the Energy and Water Regulatory Commission approved BGH natural gas trading platform as fully complying with Regulation (EU) № 312/2014 and with the current Natural gas trading rules, Natural gas market balancing rules and Daily imbalance charge calculation methodology.

As a result of Balkan Gas Hub EAD operations in the last four years, gas liquidity in the country has significantly increased, the practices of exchange trading and increasing role and share of the spot market have been introduced (within the day and the day-ahead).

The natural gas quantities traded on the BGH organized market in 2023 are a total of 45,723,956 MWh, of which 12,795,366 MWh on the short-term segment (STSPs within the meaning of Regulation 312/2014 developed according to the requirements of Article 7 of the Regulation, as well as to meet the needs of TSOs for balancing actions). Concerning the quantities under long-term products they equal 32 928 590 MWh over the year. The total number of trades in 2023 is 25 425 that is 336% more than the number of trades in 2022. The total quantities for 2023 are by 307% more than these in 2022. The liquidity of BGH grows each each year by all indicators, including the number of transactions, volumes by segments and number of members.

An important factor for the increased liquidity is the number and activity of BGH members. They reach 93 as of February 2024. Most of them are leading Bulgarian companies in the field of natural gas trade. About 41% of the members on the BGH market are foreign companies, and the members list includes leading European traders operating in the EU single gas market. A considerable part of the foreign customers are from Bulgaria's neighbouring EU member states - Greece and Romania, as well as from other countries in South-Eastern and Central Europe.

Balkan Gas Hub EAD operation is fully in line with the European objectives on establishing an interconnected and integrated pan-European gas market and in support of the plans for gas infrastructure development across Europe. The concept of establishing and developing a gas distribution hub on the territory of the Republic of Bulgaria, as well as the establishment of a gas trading exchange is actively supported by the European Commission and is in strict compliance with the needs identified by the High Level Group for Gas Connectivity of Central and South-east Europe (CESEC).

As of 2021, Balkan Gas Hub EAD is a party to the Memorandum of Understanding on cross-border cooperation on the development of an integrated natural gas market in South-Eastern and Eastern Europe - SEEGAS, a signatory to which as of the start of 2022 became Bulgartransgaz EAD as well. Exchange operators and TSOs from Greece, Romania, Austria, Poland, Hungary, Moldova and Ukraine participate together with Balkan Gas Hub EAD and Bulgartransgaz EAD in the initiative for development of an integrated natural gas market in South-Eastern and Eastern Europe. The purpose of the memorandum is to establish and develop an effective clearing system for natural gas transactions and derivatives in compliance with European practices. The project is fully supported by the European Bank for Reconstruction and Development (EBRD), as one of the support mechanisms is the conduct of focused research and assistance in the development of regional capital market infrastructure (CMI), including a post-trade environment based on of international standards and best practices.

In 2023, Balkan Gas Hub EAD became a member of EUROPEX – the association of energy exchanges, market operators and delegated operators in Europe. Europex main priorities include:

- Promoting and enabling efficient, accessible, liquid, secure and transparent wholesale energy and environmental markets;
- Representing members' interests to legislative and regulatory bodies as well as other relevant stakeholders, working for common positions on specific issues and providing a unified voice;
- Providing support to members on regional and national policy issues relevant to European wholesale energy markets.

BGH is an internationally recognized and legitimate gas exchange in Bulgaria, acknowledged by international institutions and organizations, as well as by international market participants. Thanks to the continuously improvement of interconnectivity, carried out by Bulgartransgaz EAD, this effect will be witnessed not only in the country, but in the entire region as well.

Another licensee carrying out the activity of "organizing a natural gas exchange market" is Bulgarian Energy Trading Platform AD.

1.1.4. Bulgartransgaz EAD transport and storage activities

Bulgartransgaz EAD transport and storage activities are regulated and carried out in line with the licenses issued by the SEWRC. The basic requirements for these activities are regulated by the Energy Act and the by-laws. As a transmission operator of an EU member state,

Bulgartransgaz EAD operates in accordance with the requirements of the Third Energy Liberalization Package, which are expanded and supplemented by regulations establishing network codes laid down in Regulation EC No.715/2009.

Natural gas transport

The company has concluded access and transport contracts with over 90 companies, natural gas traders, whose share in the transported quantities is increasing, especially after the launch of Balkan Gas Hub EAD trading platform.

Data on natural gas quantities transported through the gas transmission infrastructure of Bulgartransgaz EAD for 2022 and 2023 is presented in the following table:

No	Type	Quantity 2022 (MWh)	Relative share	Quantity 2023 (MWh)	Relative share
1	Transport to exit points in the country	28,202,548	17.24%	26,302 903	15.30%
2	Transport to cross-border points with neighbouring countries	135,390,955	82.76%	145,572 930	84.70%
Total:		163,593,503	100.00%	171,875 833	100.00%

In 2023, there is a significant increase compared to 2022 in gas quantities for transport to cross-border points. This is due to the increasing demand for gas transmission along routes through Bulgaria to the neighbouring countries and the region and the growing market integration in South-East Europe.

Natural gas storage

Chiren UGS plays a major role in compensating for the seasonal fluctuations in natural gas consumption and providing an emergency reserve for unforeseen and force majeure situations.

The total injected natural gas quantities in Chiren UGS in 2023 were 1,211 GWh, and the storage facility was 5,757 Gwh or 97.7% full. The withdrawn quantities are 1 131 GWh.

1.1.5. Local natural gas production

Natural gas production is carried out by Oil and Gas Exploration and Production Plc. and Petroceltic Bulgaria EOOD.

Since 2004 the company Petroceltic Bulgaria EOOD commenced natural gas local production firstly from Galata field and then from the newly discovered fields Kaliakra and Kavarna with access to the gas transmission network secured by Bulgartransgaz EAD at entry point GMS Galata.

The current operation of the country's gas fields is limited and no significant increase in production is expected in the future. However, future production may increase considering the ongoing exploration activities, including in the Black Sea waters.

1.2. Market potential and development prospects

A sustainable cross-border gas transmission system is the main pillar for the security of gas supply in the EU. Bulgaria has a strategic geographic location, a well-developed gas infrastructure with a high level of interconnection and significant capacity. With the implementation of the already realised and the planned new projects, the country is developing its potential to be an increasingly important factor in ensuring energy security and diversification of gas supply sources and routes for the region.

Despite the relatively low share of the final energy consumption, gas is important natural resource with a potential of increasing its share in the total national energy consumption over the next years.

Currently, the share of the household gas supply in Bulgaria remains lower compared to other EU member states. The promotion of gasification, the expansion of distribution companies networks and the tendency to reduce consumption of solid and liquid fuels at the expense of natural gas are a prerequisite for an increase in the use of natural gas in the household sector.

In 2023, Bulgartransgaz EAD carried out together with the neighbouring gas transmission network operators a non-binding assessment of the demand for additional capacity for interconnection points in accordance with the requirements of Regulation (EU) 2017/459 establishing a Network Code on capacity allocation mechanisms in gas transmission systems.

The results showed an expected significant increase in demand for natural gas transmission capacity in the south-north direction in synergy with the growth of gas flows, as well as a need to increase transmission capacities along the Vertical Gas Corridor.

In this regard and in accordance with the requirements of Regulation (EU) 2017/459 Bulgartransgaz EAD started joint technical studies with DESFA S.A., Transgaz S.A. And ICGB AD for the increase of the transmission capacities at the common interconnection points.

The necessary projects to increase the technical capacities at interconnection points have been identified IP Kulata/Sidirikastro, IP Stara Zagora and IP Negru Voda 1/Kardam. The binding phase of the market tests is planned for July 2024.

In January 2024, in Athens, Greece, within the framework of the meeting of CESEC High Level Group, a new Memorandum of Understanding with an extended geographical scope was signed in relation to the Vertical Gas Corridor initiative (VGC). Parties to the Memorandum of Understanding are Bulgartransgaz EAD, DESFA S.A., Gastrade S.A., ICGB AD, Transgaz S.A., FGSZ Ltd., Eustream a.s., Gas TSO of Ukraine LLC and VestMoldTransgaz S.R.L.

The initiative is supported by the European Commission and is key to increasing the security of natural gas supplies for the European Union and the countries of the Energy Community.

Ensuring the possibility of transporting additional quantities of LNG from the terminals in the

region and natural gas from the Caspian basin from south to north along the gas transmission networks of Greece, Bulgaria, Romania, Hungary, Slovakia, Ukraine and Moldova will contribute significantly to improving the security of supplies in the wider region.

With the realization of the projects for new gas transmission infrastructure, a significant increase in natural gas quantities from alternative sources is expected, to be transported through Bulgartransgaz EAD gas transmission infrastructure both, for Bulgaria and the countries of the region.

At the same time, Bulgartransgaz EAD continues to implement the project for the expansion of Chiren UGS. the objective of the project is to achieve an increase in the active gas volume up to 1 bcm and the daily injection and withdrawal capacity up to 8-10 mcm/d. The increased capacity will ensure the security of natural gas supply and will contribute to enhancing competition and access to natural gas from alternative sources, including liquefied natural gas using the existing and planned terminals in the region. In this way, the project will contribute to enhancing the liquidity of gas markets in Bulgaria and the region from South-Eastern and Eastern Europe.

Bulgartransgaz EAD participates with 20% of the share capital of Gastrade S.A. - project company which implements Alexandroupolis Independent Natural Gas System. The terminal has a regasification capacity up to 5,5 bcm of natural gas yearly. Bulgaria's participation in the project is strategically important for diversification and security of energy supply to Bulgaria and other countries in the region.

Natural gas has an important role as a transitional fuel in the policy of the European Union to cut greenhouse emissions by 2030 and the decarbonisation and achieving carbon neutrality by 2050. The EU policy is aimed at phasing-out coal use and gradual increase in the use of alternative environmentally friendly energy sources such as hydrogen.

Bulgartransgaz EAD plans a project for a high-pressure gas transmission infrastructure to supply consumers in the Maritsa East Basin.

The Company also plans projects in the hydrogen area related to the feasibility assessment and subsequent retrofitting of existing infrastructure to ensure suitability for blending natural gas with hydrogen and to build an all-hydrogen infrastructure on the territory of Bulgaria.

The described perspectives are in the basis of Bulgartransgaz EAD objectives and investment plans and are reflected in the overall company policy aimed at establishing Bulgaria as a significant regional gas distribution hub.

2. NATURAL GAS MARKET IN THE REGION

The implementation of the large-scale projects in the region for development of gas transmission infrastructure, the increase of gas storage capacities, the increase of the gas transmission capacities at the interconnection points, the development of new LNG terminals, as well as the potential of local production expects to see the increase in natural gas consumption in the country and the region in the conditions of high levels of competition and liquid markets.

Improvement of interconnectivity in the region and the provided alternative supply routes

will enable energy consumers to benefit from the opportunities of Balkan Gas Hub EAD and the significant new infrastructure projects.

In turn, this will contribute to increasing energy security, diversification of supply sources and achieve market integration of countries in the region.

The review of natural gas markets in the neighbouring countries outlines the main trends for development in the context of diversification and more tangible price competition.

2.1. Greece



Gas transmission infrastructure in Greece. Source: ENTSOG

In 2023, natural gas consumption in Greece amounted to 4.7 bcm, representing a decrease of approximately 10% on an annual basis compared to 2022 (5.2 bcm). Electricity generation accounts for a significant share of annual gas consumption. Consumption in the country is provided mainly by imports through Bulgaria, the Trans-Adriatic gas pipeline and from liquefied natural gas sources.

The Greek gas transmission operator DESFA S.A. develops projects for the increase of the technical capacity for transmission of the national gas transmission system of Greece,

through the reinforcement of the pipeline network, expansion of existing and construction of new compressor stations. In connection with the Vertical Gas Corridor initiative in order to ensure the necessary conditions for the transport of additional quantities of natural gas from the south to the north, a joint project to increase the capacity at the interconnection point IP Kulata/Sidirikastro in the direction from Greece to Bulgaria has been prepared between DESFA S.A. and Bulgartransgaz EAD between DESFA S.A. And Bulgartransgaz EAD. This is the prerequisite for creating the necessary conditions for the transport of additional quantities of natural gas from south to north.

The implementation of the VGC initiative will help meet the growing demand for natural gas in the region and significantly improve the conditions for diversification and the security of gas supplies.

The investments planned will enable increase of the capacity from Greece to Bulgaria at the interconnection point IP Kulata/Sidirokastro up to 9.7 mcm/day.

The construction of new LNG terminals is among the priorities of the country, relying increasingly on sources in the region of the US, the Mediterranean, the Middle East and Central Asia. Currently, Greece has one operating LNG terminal in Revitoussa. In 2024, the terminal in Alexandroupolis is to be put into operation. The total regasification capacity is expected to reach up to 25,7 thanks to the new LNG terminals in the country planned by 2025 bcm/y.

Existing and planned LNG infrastructure in Greece:

Facility	Year of commissioning	Type	Operator	Regasification capacity (bcm/year)
Revithoussa LNG Terminal	1999	On-shore	DESFA	7
Alexandroupolis LNG Terminal	Q2 2024	Floating	Gastrade	5.5
Dioriga Gas FSRU	Q2 2025	Floating	Dioriga Gas	2.5
Thrace LNG	Q4 2024	Floating	Gastrade	5.5
Argo FSRU	Q1 2025	On-shore	Medgas	5.2

Gas Interconnection Greece-Bulgaria (IGB)

Interconnection Greece-Bulgaria, run into commercial operation in October 2022, has a transmission capacity in direction from Greece to Bulgaria of up to 3 bcm/year. An increase of the total technical capacity is planned from 3 bcm/y to 5 bcm/y as of the forth quarter of 2025 for the entry-exit point in Stara Zagora and as of the fourth quarter of 2026 for the entry-exit point in Komotini.

Trans-Adriatic Pipeline (TAP)

The 878 km long Trans-Adriatic Pipeline (TAP) is part of the Southern Gas Corridor, transporting natural gas to Europe from Shah Deniz II field in Azerbaijan. The current annual capacity is 10 bcm/y. The pipeline is connected to the Trans-Anatolian Gas Pipeline (TANAP) at the Turkish-Greek border and passes through Greece, Albania and the Adriatic Sea, reaching its end point in Southern Italy.

Bulgaria has connectivity with TAP along two independent routes - via Bulgartransgaz EAD networks and DESFA S.A. And via IGB. Via Bulgartransgaz EAD network access to the supplies of Caspian natural gas along the TAP have all neighbouring countries, that further contributes to the availability of gas from alternative sources and the security of the energy supply to the region.

EastMed

Various options for the project are being considered, including a shorter route involving the construction of about 300 km of an offshore gas pipeline between Israel and Cyprus, as well as natural gas liquefaction facilities in Cyprus. The implementation of the project will provide an opportunity to supply liquefied natural gas to the European markets from the Eastern Mediterranean gas fields.

Revithoussa LNG Terminal

Revithoussa liquefied natural gas terminal has annual regasification capacity up to 7 bcm and 225 000 thousand m³ storage capacity. Higher liquidity in the natural gas market is achieved through it and it contributes to security of gas supply to Greece and the region.

As of 2019, the terminal enables the supplies of liquefied natural gas to the Bulgarian market, including from the USA.

Alexandroupolis Independent Natural Gas System

The terminal has 5.5 bcm/y design capacity for regasification and supply to the Greek gas transmission system up to 5,5 bcm/y. The storage capacity is 153.500 thousand m³. Potential supply sources include large LNG producers such as the USA, Algeria and Qatar.

Bulgartransgaz EAD is a shareholder in the terminal with a 20% of the capital of Gastrade S.A. - project company for terminal implementation.

The project is of key importance for the security of supply and the diversification of natural gas sources in a regional plan. The realisation of the project is in synergy with the expansion of Chiren underground gas storage facility that will provide more flexibility and security to the natural gas market in Bulgaria and the region,

2.2 Türkiye



Gas transmission infrastructure in Türkiye Source: ENTSOG

In 2023, natural gas consumption in Türkiye amounted to approximately 50.3 bcm, which is a decrease by about 3% on an annual basis compared to 2022 (52 bcm). During the winter period, peak consumption reached levels of 250-300 mcm/day. Demand is expected to increase in the future due to the growth of the country's economy.

A large share of natural gas in Türkiye is used to generate electricity. Demand is expected to increase in the future, as Türkiye plans the construction of new gas-fired power plants. Following the recent discovery of offshore gas fields with significant reserves, much of the country's electricity generation is planned to be covered by local production.

Production from Türkiye's domestic deposits in 2023 amounts to 807 mcm, which covers about 2% of the domestic consumption. At the same time, in April 2023, the Sakarya gas field was brought into operation, and it is expected that in the first phase in the period 2023-2025 the production will increase to 3.6 bcm/y, and thereafter will reach close to 15 bcm/y in the second phase until 2028.

In 2023, Türkiye imported 48.8 bcm of natural gas, 10% of which was supplied by the United States. The share of Russian gas imported through the two Black Sea gas pipelines, Blue Stream and TurkStream, has been decreasing in recent years. This is due to the fact that supply is diversified through supplies from Iran and Azerbaijan, as well as liquefied natural gas from various sources.

Deliveries from Shah Deniz II field in Azerbaijan are made through the Trans-Anatolian Gas Pipeline (TANAP). The first stage capacity is 16 bcm/y, of which 10 bcm/y are transited to the European markets and 6 bcm/y are intended to cover Turkish domestic consumption. It is planned to expand the pipeline and reach a capacity of up to 32 bcm.

Türkiye has five liquefied natural gas terminals (three floating and two on-shore) with a total regasification capacity of over 53 bcm/y, and expansion is planned for some of them in the

forthcoming years.

LNG infrastructure in Türkiye:

Facility	Year of commissioning	Type	Operator	Regasification capacity (bcm/year)
Marmara Ereğlisi LNG Terminal	1994	On-shore	BOTAS	12.80
Aliaga İzmir LNG Terminal	2006	On-shore	EgeGaz	13.80
Aliaga Etki LNG Terminal (Turquoise)	2016	Floating	Etki Liman	7.30
FSRU Dörtyol (Ertuğrul Gazi)	2018	Floating	BOTAS	9.70
FSRU Gulf of Saros	2022	Floating	BOTAS	9.70

LNG share in Türkiye for 2022 was 27.75% of the total import and amounts to 15.17 bcm. The main sources of LNG supplies for the country are Algeria, USA, Nigeria, Egypt, etc. In January 2024, Bulgartransgaz EAD and BOTAS S.A. Signed an Interconnection Agreement for the IP Strandzha/Malkoclar. This is of key importance for the diversification of natural gas sources not only for Bulgaria, but also for the regional and European gas markets. By Türkiye's gas transmission network, access shall be provided to natural gas from local fields, Azerbaijan, Iran and the global LNG market through Türkiye's regasification terminals.

2.3 Romania



Gas Transmission Infrastructure in Romania Source: ENTSOE

The consumption of natural gas in the country in 2023 amounts to 9.5 bcm, marking a decrease of about 6.86% on an annual basis compared to 2022. This number includes a decrease in imports at the expense of the amount of natural gas produced from local fields, which has increased compared to 2022. Underground gas storage is provided by six underground storage facilities with a total active capacity of 3,2 bcm.

Romania has the ambition to consolidate its importance as a producer of natural gas in Europe from 2027 following the implementation of the project for natural gas production from the Neptun Deep block in the Black Sea.

As part of the Vertical Gas Corridor initiative, technical studies have been carried out by Bulgartransgaz EAD and the Romanian gas transmission operator Transgaz and a project has been defined to increase the gas transmission capacity from Bulgaria to Romania at the interconnection point IP Negru Voda 1/Kardam. This project is in line with the objectives of the countries of Central and South-Eastern Europe to diversify and increase the supply of gas from alternative sources, including LNG.

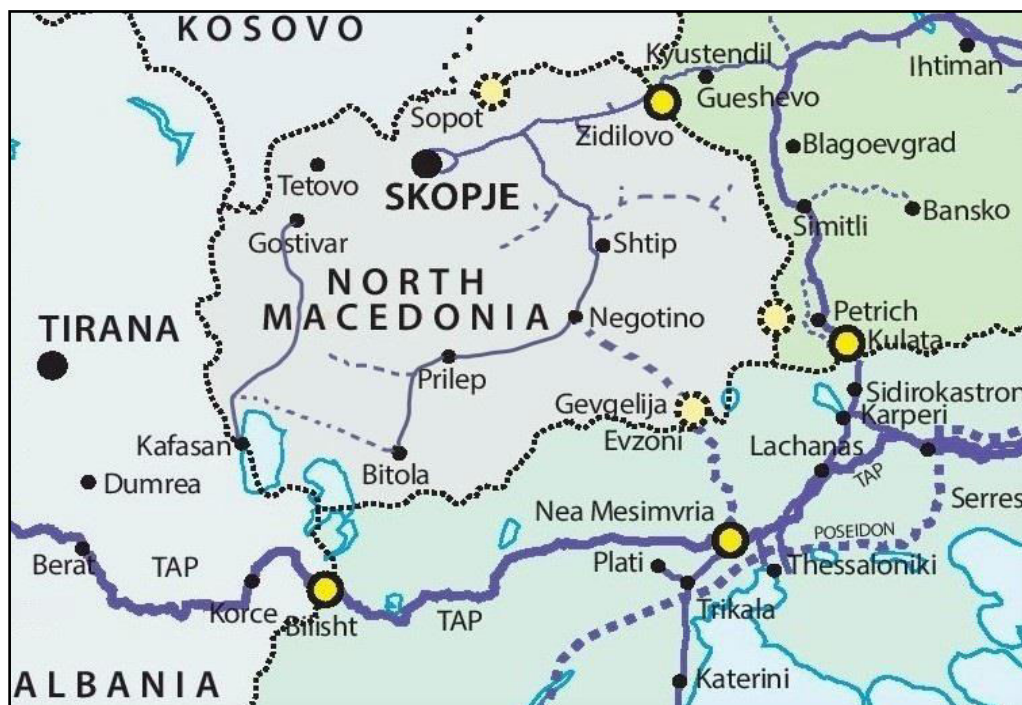
An important role is played by the interest in providing physical reverse flow at the interconnection points of the Romanian and Ukrainian gas transmission systems. Ukraine has

the largest number of gas storage facilities within Europe, thus ensuring the supply of natural gas from the southeast through the Bulgarian and Romanian transmission systems.

Interconnection Romania-Serbia

At the moment, the only neighbouring country that does not have interconnection with Romania is the Republic of Serbia. A project for the construction of a 97-km gas pipeline is underway, 85 km of which on the territory of Romania and 12 km on the territory of Serbia. The interconnection will ensure the connectivity of the gas transmission networks of both countries, providing bi-directional transmission capacity of 1.6 bcm/year.

2.4 The Republic of North Macedonia



Gas transmission infrastructure in the Republic of North Macedonia. Source: ENTSOG

Natural gas consumption in North Macedonia is still low. For 2023, it amounted to 0.35 bcm, which is an increase of over 14% on an annual basis compared to 2022 (0.28 bcm).

On the territory of the Republic of North Macedonia NOMAGAS AD Skopje carries out the activities of transmission and management of the transmission system for natural gas. The high-pressure gas infrastructure supplies mostly the area of the city of Skopje. The natural gas market is in a process of development and at the moment it is mainly used in the industrial sector and local heating companies. Due to the lack of gas transmission infrastructure, consumers in the south-eastern part of the country are supplied with compressed natural gas imported from Bulgaria.

The Ministry of Economy of North Macedonia estimated that natural gas consumption will increase significantly over the next years after the construction and run into operation of new co-generation combined heat and power plants (CHP) and the realisation of the separate phases of the national project for the Gasification of the Republic of North Macedonia.

In this regard, the Republic of North Macedonia and Albania concluded a Memorandum of Understanding in the field of energy to strengthen the cooperation in planning a new gas infrastructure, renewable energy and construction of a new LNG terminal in Vlora.

As of the end of 2022, an Interconnection Agreement for the IP Kyustendil/Zhidilovo was signed between Bulgartransgaz EAD and GA MA AD (restructured in NOMAGAS AD) according to which the technical capacity increased by 500 thousand cu m daily or 182 mcm/y. The document has a key role in diversifying and increasing the security of natural gas supplies in North Macedonia. Kyustendil/Zhidilovo is the only entry point for natural gas supplies in the country which does not possess own natural gas fields and storage. Following the signing of the agreement, North Macedonia was given the opportunity to access alternative sources of gas, including LNG and benefit from the natural gas storage services in Chiren underground gas storage facility.

The Greece-North Macedonia Interconnection project is in an initial phase and it envisages construction of a gas pipeline of 123 km total length, 68 km of which on the territory of the Republic of North Macedonia. The initial gas pipeline capacity is planned to be 1.5 bcm/y with a possibility to rise up to 3 bcm/y. Studies are also underway of the suitability of the future gas pipeline to transport hydrogen.

A project at the conceptual stage for a second interconnection between the gas transmission systems of Bulgaria and North Macedonia with Petrich - Strumica route is also under consideration that will provide a further opportunity to diversify and guarantee gas supplies to North Macedonia. The market test for the new infrastructure is pending.

2.5. Serbia



Gas transmission infrastructure in Serbia Source: ENTSOG

Natural gas consumption in Serbia in 2023 remained approximately 3.1 bcm. Natural gas production in Serbia is carried out in the region of Vojvodina by the company Naftna Industrija Srbije. The main part of the consumption of natural gas in Serbia is provided through imports along the gas transmission network of Bulgartransgaz EAD. Local production meets about 7% of demand.

In 2022, Serbia and Hungary signed a bilateral agreement on cooperation in the energy sector, according to which Serbia can store 500 million cubic meters in Hungarian gas

storage facilities. Serbia also has its own gas storage – Banatski Dvor with a storage capacity of 427 mcm.

In December 2023, the interconnection Bulgaria – Serbia (IBS) has been put into commercial operation. The project IBS is key to improving the energy connectivity in the region and includes an interconnection with a route from Novi Iskar in Bulgaria to Nis in Serbia with a total length of 170 km, as well as gas regulation stations to the towns of Slivnica and Dragoman. The capacity of the interconnection is 5 mcm/d (1,8 bcm/y) with a possibility for a reverse flow.

In November 2023, Serbia has signed an agreement with Azerbaijan for the supply of up to 400 million cubic meters of gas per year by 2026, with a possibility to triple these quantities as of 2027.

In October 2023, Gastrans d.o.o. and Bulgartransgaz EAD published a Joint Market Demand Assessment Report on the incremental capacity at IP Kireevo/Zaichar according to which GASTRANS d.o.o. will launch a project to increase the technical capacity for the entry Serbia up to 406 524 342 KWh.

2.6 Current status, market potential and development prospects

according to data of the International Energy Agency (IEA), the world natural gas consumption in 2023 reached 4,09 trillion **cu m** and grew by about 0,5% compared to 2022 (4,07 trillion **cu m**).

In 2023, gas consumption in the EU amounted to 290 bcm, which is a drop of over 15% compared to 2022 (350 bcm). The decline can be considered temporary and is largely the result of the volatility of natural gas prices and the efforts of Member States to collectively reduce gas consumption in accordance with Regulation (EU) 2022/1369 on coordinated demand-reduction measures for gas.

In 2023, the share of Russian gas imports to the EU shrank to around 14.8% (42.9 bcm), representing a drop of over 45% compared to 2022 (80 bcm). The trend is the import of Russian gas to the EU to continue to decrease. Efforts are focused on diversifying the sources and increasing the natural gas supplies from reliable suppliers, as well as optimizing the existing gas transmission infrastructure and LNG terminals.

In 2023, LNG consolidated its role as the main source ensuring consumption in the EU. Liquefied gas supplies reached around 120 bcm on an annual basis, accounting for over 40% of consumption and half of gas imports. About 50% of liquefied gas supplies to the EU come from the US.

To offset the declining imports from Russia, the EU is expanding its natural gas imports from various sources such as Norway, the USA, North Africa, Qatar, the UK and other alternative suppliers. In 2023, the imported quantities from Norway and the USA reached about 144 bcm (87.8 bcm from Norway and 56.2 bcm from the USA), which represents approximately 50% of the total gas imports into the EU.

The concept of enhancing the EU's energy security envisages increasing the supply of LNG to member states by building infrastructure, ensuring access of domestic markets to the global LNG market, as well as overcoming infrastructure bottlenecks. The share of LNG in EU

imports is expected to continue to grow in the short and medium term.

In the last years, Bulgartransgaz EAD has made important investments in the rehabilitation, modernization and capacity increase of the existing gas infrastructure. The company is actively working to increase the energy security by improving the interconnectivity with the neighbouring countries and creating the conditions to accelerate the process of diversification of natural gas supply sources and routes and increasing the energy security.

The network of Bulgartransgaz EAD for customers in the country and the neighbouring markets is used for the transport of significant supplies from various sources, such as Azerbaijan, the USA and others, including supplies of liquefied natural gas. The Alexandroupolis LNG terminal and other terminals in the region will further contribute to increasing the security of supply, diversification and competition for the benefit of end-users.

The development of the interconnectivity between Bulgarian and the countries from the region has a significant importance to achieving a market integration against the backdrop of increased demand for natural gas in the region.

The provision of sufficient capacity at interconnection points along the Vertical Corridor will allow the transport of increasing LNG volumes from the region's LNG terminals, in synergy with the observed significant growth in gas flows from south to north resulting from the diversification and security of supplies policy to the countries of South-Eastern, Eastern and Central Europe.

This will enable customers in South-Eastern, Eastern and Central Europe to get additional quantities of natural gas from the LNG terminals and the Southern Gas Corridor.

The Vertical Gas Corridor initiative is fully in line with the REPowerEU plan and the goal of ending the EU's dependence on imports of Russian energy sources.

Bulgartransgaz's projects for capacity increase of Chiren UGS, technical capacity increase at the interconnection points will contribute to achieving a higher degree of market integration and ensuring the natural gas supplies for the country and the region, providing access to various natural gas sources including LNG terminals.

The project for the expansion of Chiren UGS is expected to be completed by the end of 2024. Providing additional storage volume will promote natural gas trade, increase market competition and contribute to liquid gas market functioning. The expansion of Chiren UGS is also in synergy with the LNG terminal project near Alexandroupolis and all other Bulgartransgaz EAD's projects will enable gas traders and consumers in the region to take full advantage of the dynamic development and competitive advantages provided by the liquefied natural gas market.

Bulgartransgaz EAD is planning projects with a positive cross-border effect, which will lead to increased gas transmission capacities from Greece to Bulgaria, as well as from Bulgaria to Romania and North Macedonia, thus creating the conditions to boost the diversification in the region and the security of supply.

Developing its gas transmission infrastructure and storage capacity and providing new supply routes and cross-border transmission of natural gas, Bulgartransgaz EAD responds adequately to the tendency for increased flows of gas from south to north and diversification

of supply sources as well as with regard to the pan-European priorities in the climate and energy sector.

The implementation of the planned infrastructure projects in the country and the region will lead to stable integration of the gas market, ensure connectivity with the gas hubs in Central and Eastern Europe, as well as facilitate access to new sources. Favourable conditions for diversification will be created respectively reducing the energy dependency, which will also lead to an increase in the gas volumes traded on the gas exchange.

In view of the expected changes resulting from the Green Deal and the achievement of the indicative targets for 2030 and 2050, activities related to the EU's energy transition trends are under way by facilitating the entry of renewable and low-carbon gases, including hydrogen.

Some countries have already developed strategies and roadmaps for the implementation of hydrogen in the existing infrastructure.

As a responsible company, Bulgartransgaz EAD welcomes the European Union's plans for decarbonisation of the energy and industrial sector and strives to be adequate to the adopted pan-European priorities in the climate and energy field. In this regard, the Bulgarian TSO, since 2021 participates in European Clean Hydrogen Alliance and European Hydrogen Backbone, initiatives aimed at widespread implementation of hydrogen technologies and establishment of a model of pan-European hydrogen transmission infrastructure.

Bulgartransgaz EAD is also an active participant in connection with the initiative to create a European network of (future) hydrogen network operators - the European Network of Network Operators for Hydrogen (ENNOH). Together with other European TSOs intending to be hydrogen network operators, Bulgartransgaz is involved in the development of a concept for the operation of ENNOH, implementation of the relevant regulatory framework and cooperation between operators to synchronize views and join efforts in relation to progress on the development of hydrogen networks and decarbonisation of the energy sector in synergy with the EU medium and long term objectives.

In the context of Hydrogen Roadmap Europe and in line with the energy and climate strategic goals and priorities of Bulgaria, Bulgartransgaz EAD envisages:

- retrofitting of the existing gas transmission infrastructure to ensure suitability for operation with up to 10% hydrogen;
- new hydrogen infrastructure between the Sofia region and the Bulgarian-Greek border in the Kulata region with a subsequent development of the infrastructure to Romania.

On 28.11.2023, the first list of EU projects of common and mutual interest was published on the grounds of Regulation (EU) 2022/869 on guidelines for trans-European energy infrastructure. The list includes a total of 166 projects that contribute to the acceleration of the energy transition and the achievement of the Union's energy and climate goals by 2030 and 2050. Bulgartransgaz EAD has a project for the construction of hydrogen transmission infrastructure included in the list under number 10.3.2 "Internal infrastructure in Bulgaria to



the border with Greece", which is part of the interconnections for hydrogen in Central, Eastern and South-Eastern Europe.

NATURAL GAS TRANSPORT AND STORAGE



Chiren UGS

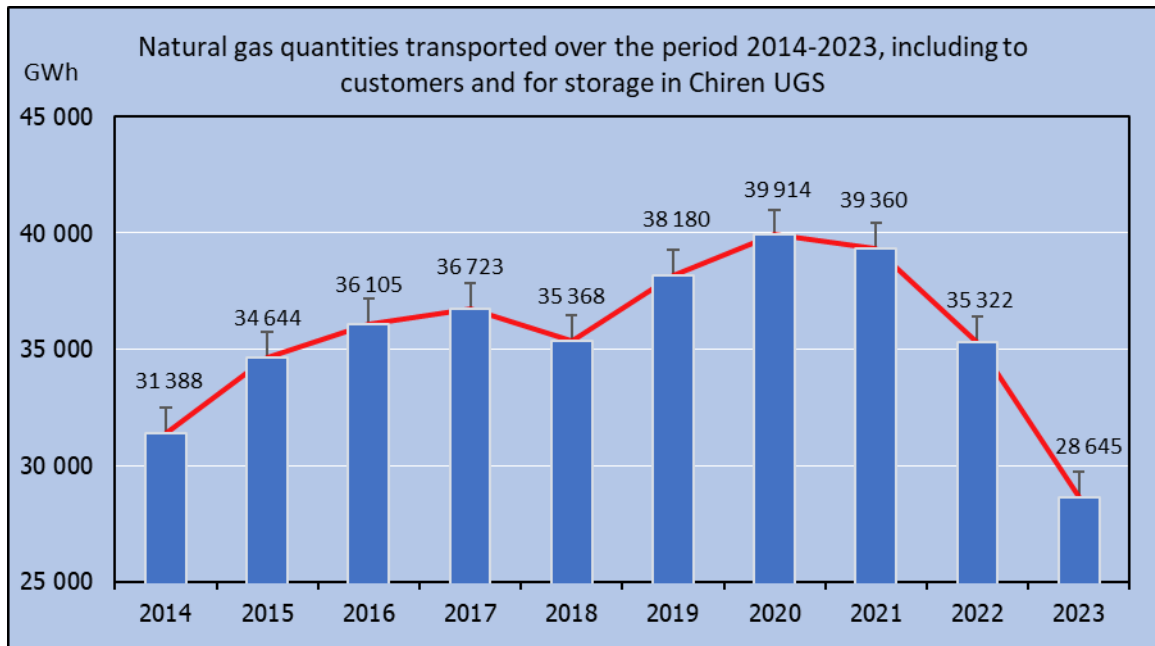
1. NATURAL GAS TRANSPORT

In its capacity of a licensed gas transmission operator Bulgartransgaz EAD shall ensure:

- Uniform management and reliable operation of the gas transmission networks to secure natural gas transport in compliance with the requirements for service quality and reliability;
- Maintenance, rehabilitation and modernization of the sites and facilities of the gas transmission networks according to the national and European technical requirements, occupational safety rules and the conditions for environmental protection, while applying the good practices in these areas;
- Development of the gas transmission networks in line with the economic feasibility and the social and economic needs of our country;
- Access of clients to the gas transmission services under transparent and non-discriminatory conditions according to the requirements of the national and the Community legislation and the good European practice.

Natural gas transported to consumers in the country (including the volumes transported for injection in Chiren UGS) in 2023 is 28,645 GWh and has decreased by 19% compared to the previous year.

The natural gas quantities transported in the last ten years (including the quantities transported for injection in Chiren UGS) are shown in the diagram:



The natural gas quantities indicated as delivered in the country from import and local production (28,645 GWh) and respectively the actually transported natural gas quantities (26,303 GWh) differ due to the fact that the transmission activity also includes:

1. Quantities transported for injection in Chiren UGS;
2. Difference between the injected and withdrawn quantities in Chiren UGS;
3. Technological losses, technological differences due to the accuracy of the metering devices, etc.

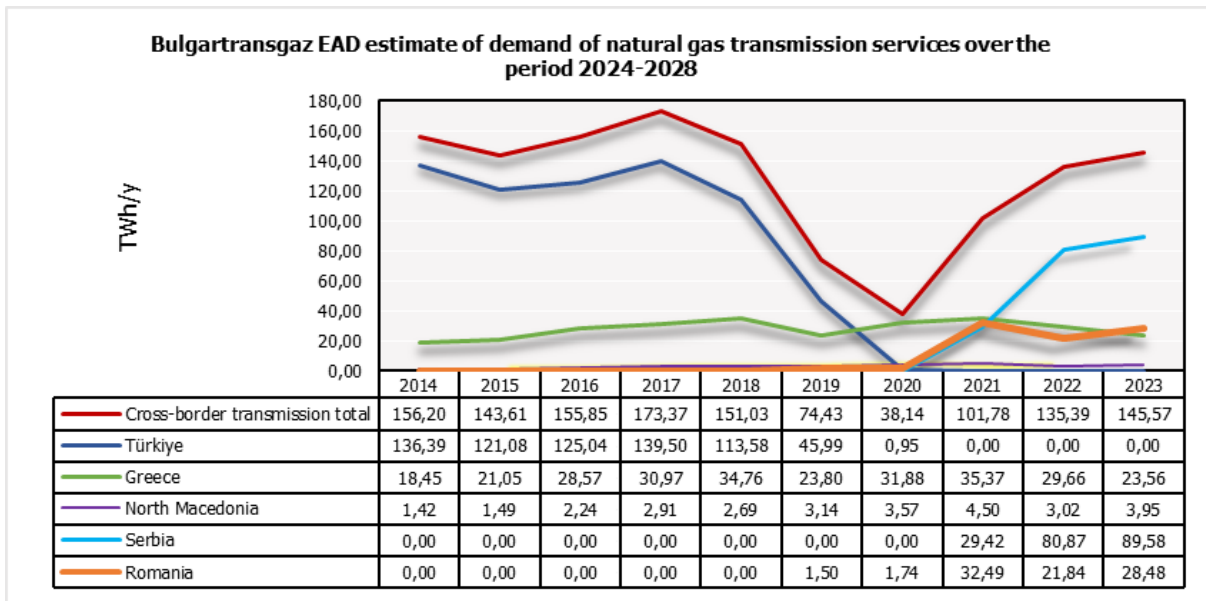
2. CROSS-BORDER NATURAL GAS TRANSPORT

Physical quantities of natural gas transported across borders in 2023 are 145,573 TWh or over 7.5% more than in 2022 (135,391 TWh). The transported quantities meet 100% of the consumption in the Republic of North Macedonia and significant part of the consumption in Greece and Serbia.

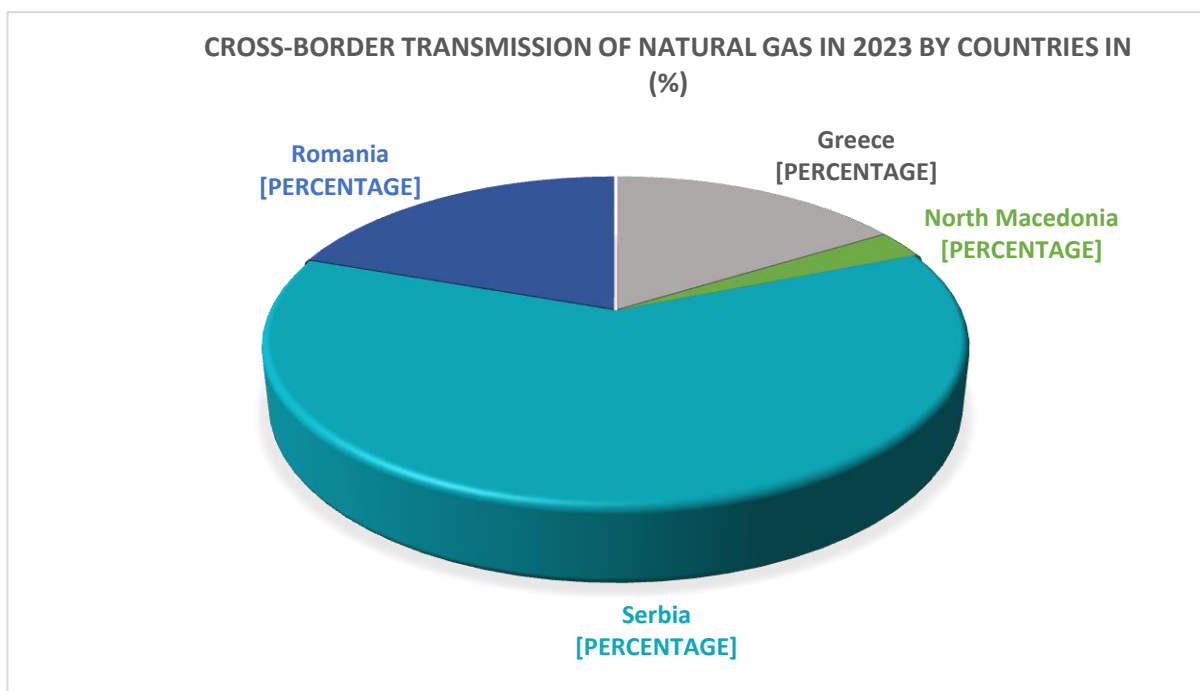
It is expected that in the coming years, with the implementation of the new interconnection projects, increased technical transmission capacity and other priority projects in the region, natural gas volumes transported to increase and exceed the 2022 and 2023 levels.

Additional growth in the cross-border transmission in the coming years is also expected in connection with the implementation of the strategic projects under the Vertical Corridor initiative, as a result of the demand in the EU for supplies from alternative sources of pipeline and LNG.

Cross-border transmission through the territory of Bulgaria for the period 2014-2023 is shown in the diagram below:



The percentage distribution of the cross-border transmission in 2023 by countries is:



3. NATURAL GAS STORAGE

Pursuant to Licence No. Л--214-10/29.11.2006, issued by SEWRC, Bulgartransgaz EAD provides natural gas storage services by using its own underground gas storage (UGS) Chiren near the village of Chiren, Vratsa Municipality. The gas storage has 24 exploitation wells, a compressor station with approximately 9 MW total installed capacity and auxiliary technological facilities necessary for securing the natural gas storage. Currently, when filled in at a maximum, Chiren UGS is able to cover about 25-30% of the daily needs during the cold winter months. The injected and withdrawn natural gas quantities depend on the market conditions and the optimal technical capabilities of Chiren UGS in compliance with the rules for safe operation. Bulgartransgaz EAD and the natural gas companies who have clients with irregular consumption are obliged to maintain a strategic reserve related to the security

of supplies and the seasonal fluctuation coverage.

Currently, Chiren UGS is considered mostly as a gas storage facility of local importance – major instrument for covering seasonal fluctuations in the natural gas consumption and supply in the country and for ensuring the security of supply.

The project for the expansion of Chiren UGS that is underway makes it perspective for it to be transformed into a commercial storage playing an important role in developing the competition and increasing the benefits for natural gas consumers in the conditions of an integrated and interconnected regional gas market.

The projects aimed at increasing the transmission capacities with the neighbouring countries, together with the LNG terminal in Alexandroupolis, will enhance the market integration in the region and represent a prerequisite for Chiren UGS to play an increasingly important role in securing additional flexibility of the gas transmission systems at regional level.

In 2022, 4,564 GWh of natural gas were injected and 2,555 GWh were withdrawn, and in 2023, 1,211 GWh of natural gas were injected and 1,131 GWh were withdrawn.

Information on natural gas injection and withdrawal by months is shown in the table below:

Natural gas quantities withdrawn and injected in 2022 and 2023								
Month	Withdrawal				Injection			
	2022		2023		2022		2023	
	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters
January	1,096.342	103,968	11.915	1,098	0	0	0	0
February	521.792	49,436	264.347	24,477	0	0	0	0
March	201.793	19,082	0.000	0	0	0	0	0
April	50.075	4,729	0.000	0	109	10,257	30.588	2,827
May	0.000	0	0.000	0	256.273	24,177	450.605	41,917
June	0.000	0	0.000	0	745.091	70,027	120.897	11,215
July	0.000	0	0.000	0	744.518	69,277	9.547	880
August	0.000	0	0.000	0	830.918	76,962	359.259	32,077
September	0.000	0	0.000	0	798.588	74,739	153.343	14,036
October	0.000	0	0.000	0	867.894	81,340	86.762	7,956
November	87.436	8,141	372.356	34,177	212	19755.423	0.000	0
December	597.795	55,198	482.680	44,323	0	0	0	0
Total:	2,555	240,553	1,131	104,075	4,564	426,535	1,211	110,907

SCENARIOS FOR CAPACITY DEMAND AND SOURCES TO COVER THE DEMAND IN THE COUNTRY



Metering lines in GMS

1. NATURAL GAS DEMAND

The demand scenario has been developed taking into account the relationship between the historical gas consumption in the country and the main macroeconomic indicators, comparative analysis of the gas markets in the EU and Bulgaria and the expected increase in the consumption resulting from the connection of new users and expansion of the production capacities.

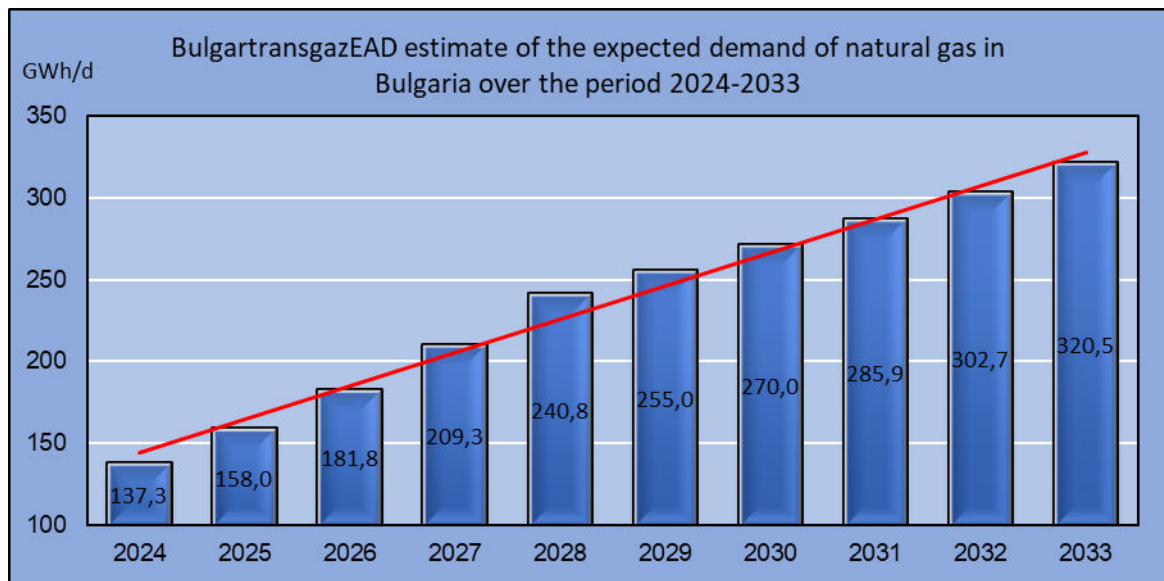
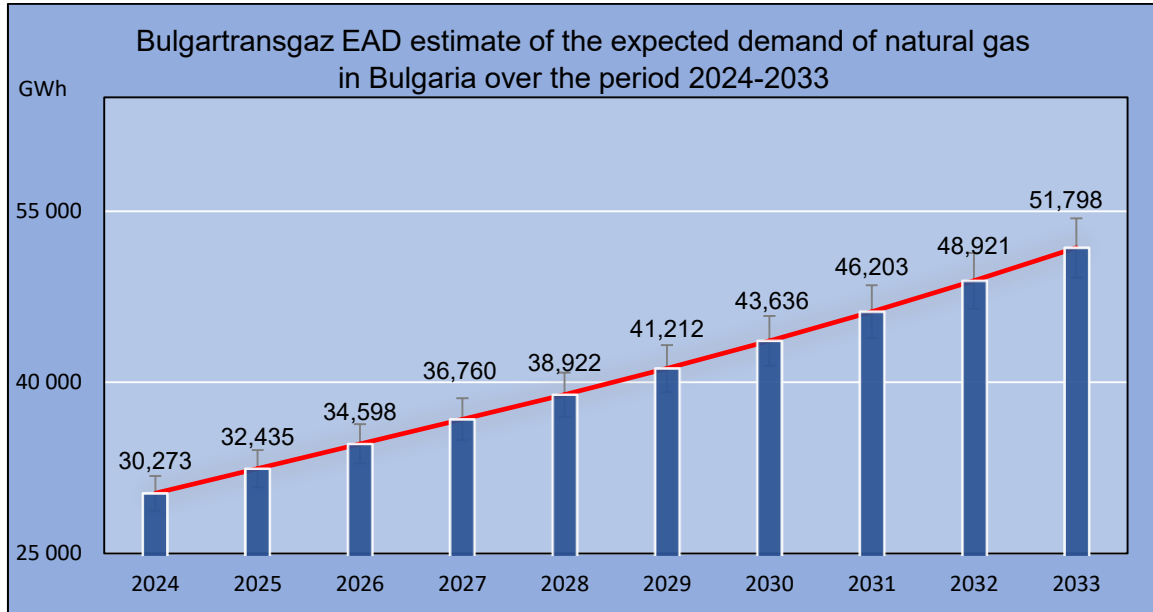
The relationship between the final and primary energy consumption (FEC and PEC) and the GDP growth for past periods have been analysed as well¹.

The main assumptions made based on an analysis of the past ten-year period and a comparative analysis of the EU gas market are as follows:

- Sustainable economic growth;
- Economy recovery after the COVID-19 pandemic;
- Increasing the natural gas share in PEC and FEC in the countries from the region in connection with increasing the level of gasification and reducing the use of coal;
- Increase of the natural gas supply from alternative sources to Bulgaria and the region.

¹ National Statistical Institute, www.nsi.bg; Eurostat, www.epp.eurostat.ec.europa.eu

Forecast on natural gas consumption in Bulgaria and expected peak daily demand levels during the winter months are shown in the diagrams:

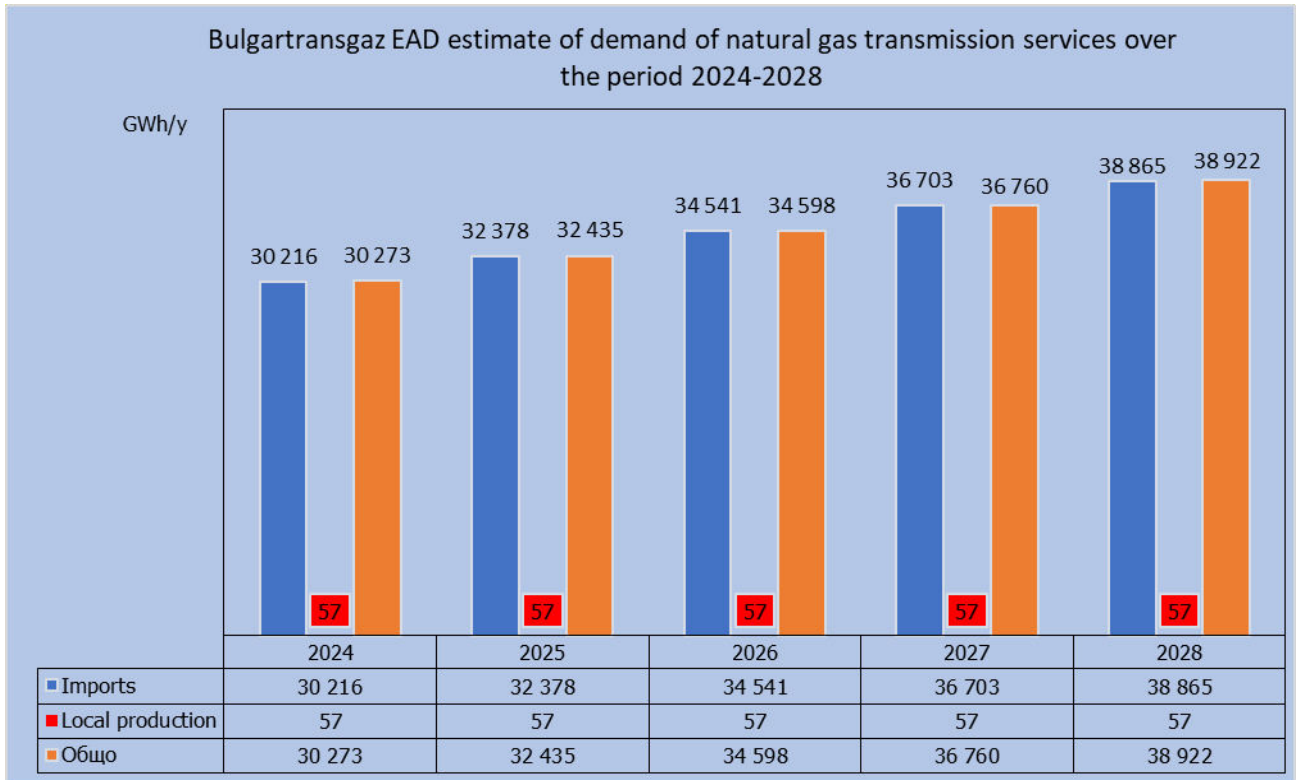


2. SOURCES TO MEET THE DOMESTIC DEMAND

In 2023, natural gas demand has been satisfied as follows:

- Import - 26,246 GWh (99.8%);
- Local production – 57 GWh (0.2%).

The forecast on the sources meeting the natural gas demand in the country for the period 2024-2028 is shown in the diagram below:



2.1 Import

Since 2019, due to the increased transport capacity from Greece to Bulgaria, supply from alternative sources has been carried out. The natural gas mix from imports includes gas new sources, coming from new routes and suppliers resulting from the implementation of the new gas projects and fields being developed. There is a trend towards diversification of gas supplies to neighbouring countries.

Main natural gas sources for the countries in the region within the considered period are:

- Increasing natural gas volumes from sources in the Southern Gas Corridor - the Caspian region, the Middle East and the Eastern Mediterranean;
- Increasing LNG quantities from various sources through the LNG terminals in Greece and Türkiye, the plans for capacity increase of the existing terminals, as well as construction of new ones;
- Natural gas from hubs in Western and Central Europe;
- Decreasing quantities of Russian natural gas;
- Production in the countries from the region.

2.2. Local Production

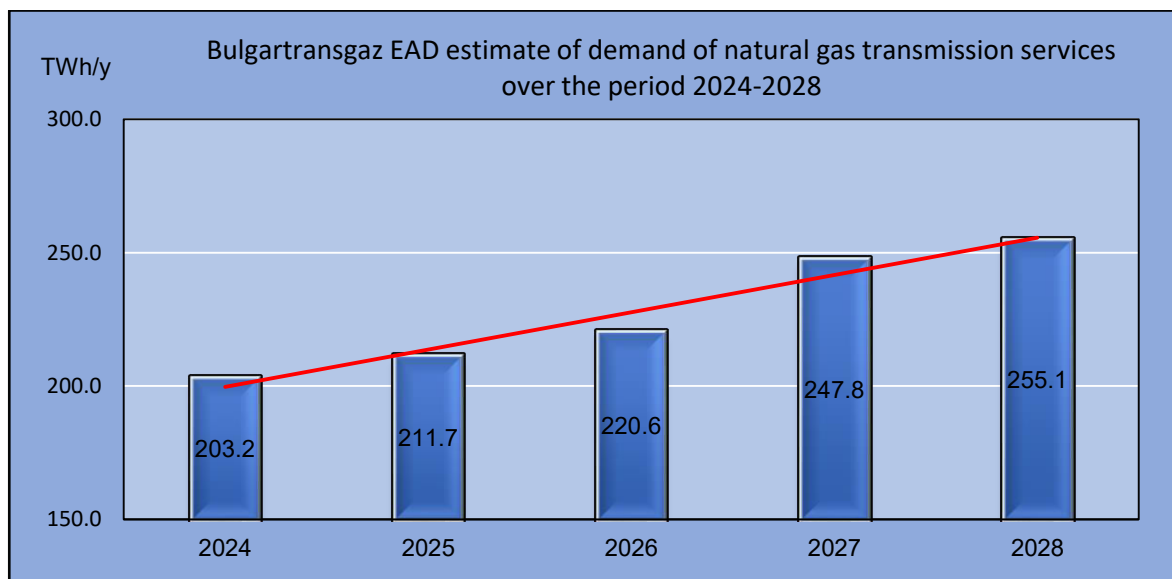
In 2024, the level of local production is expected to remain very low. Considering the permits issued for oil and gas exploration, domestic production can be expected to increase in the coming years in the event of new gas discoveries offshore the Black Sea.

3. FORECAST OF DEMAND FOR NATURAL GAS TRANSPORT SERVICES THROUGH BULGARTRANGAZ EAD INFRASTRUCTURE

Bulgartransgaz EAD expects the demand for natural gas transport services to increase in the coming years in connection with:

- ensuring natural gas transport capacities at the existing interconnections;
- the accelerated diversification of natural gas sources in the region of South Eastern Europe;
- the realisation of projects for new LNG terminals in the region;
- the utilisation of the available capacity possibilities of the gas transmission system, operated by the Company;
- Chiren UGS capacity expansion;
- the growth in natural gas consumption in the country;
- the development and establishment of a liquid regional gas market.

The forecast for the transportation services of natural gas over the period 2024 - 2028 to exit points of the gas transmission system, including interconnection points, is shown in the following chart:



SECURITY OF SUPPLY

GMS Strandzha

The calculation of the N-1 standard was prepared for the period 2024-2028 according to Article 5 of Regulation (EU) No. 2017/1938 concerning measures to safeguard security of gas supply and repealing Regulation (EU) No.994/2010.

The N – 1 formula describes the ability of the technical capacity of the gas infrastructure to satisfy total gas demand in the calculated area in the event of disruption of the single largest gas infrastructure during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.

In the event of a disruption of the single largest gas infrastructure, the capacity of the remaining infrastructure should be able to supply the necessary gas quantities to satisfy the total gas demand in the area under calculation, i.e. N-1>100%.

The infrastructure standard implementation formula used for this TYNDP is as follows:

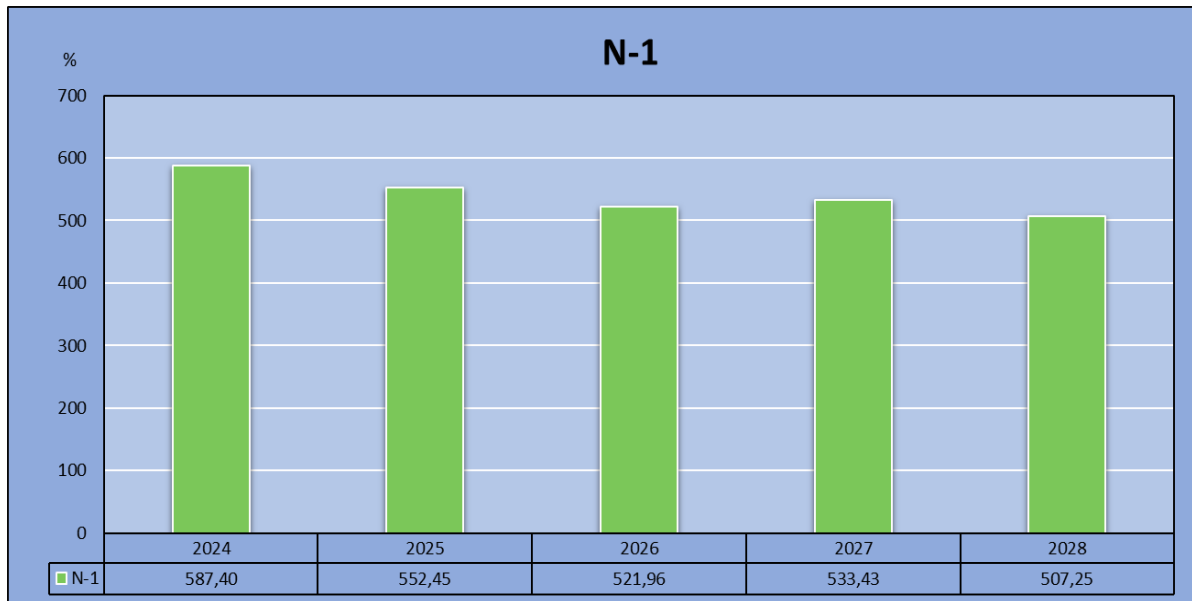
$$N - 1 [\%] = \frac{EP_m + P_m + S_m + LNG_m - I_m}{D_{max}} \times 100$$

where:

EP1	Technical capacity of IP Strandzha 2/Malkoclar, mcm/d
EP2	Technical capacity of GMS Negru Voda 1/Kardam, mcm/d
EP3	Technical capacity of the Interconnector Bulgaria-Serbia, mcm/d
EP4	Technical capacity of IP Kulata/Sidirokastro, mcm/d
EP5	Technical capacity of IP Ruse/Giurgiu (IBR), mcm/d
EP6	Technical capacity of IP Stara Zagora (IGB), mcm/d
EP7	Technical capacity of IP Kireevo/Zaycar, mcm/d
EP8	Technical capacity of IP Strandzha/Malkoclar, mcm/d
LNGm	Maximum technical capacity of the LNG facilities
Smax	Withdrawal from UGS Chiren – the maximum possible
Pmax	National gas production – the maximal possible production
Dmax	National consumption – peak consumption
Imax=EP1	The single largest gas infrastructure - IP Strandzha 2/Malkoclar, mcm/d

The results of the N-1 formula for the next five years are as follows (capacity data in the formula N-1 are expressed in mcm/d in line with the Regulation):

Година	Pmax	Smax	EP2	EP3	EP4	EP5	EP6	EP7	EP8	Dmax	LNGmax	Ep1=Imax	N-1
mcm/d													%
2024	0,03	4,70	20,27	0,72	6,12	4,11	11,42	32,00	11,00	15,38	0,00	54,60	587,40
2025	0,03	5,40	20,27	0,72	6,12	4,11	11,42	32,00	11,00	16,48	0,00	54,60	552,45
2026	0,03	6,10	20,27	0,72	6,12	4,11	11,42	32,00	11,00	17,58	0,00	54,60	521,96
2027	0,03	6,80	20,27	0,72	9,50	4,11	15,22	32,00	11,00	18,68	0,00	54,60	533,43
2028	0,03	7,50	20,27	0,72	9,50	4,11	15,22	32,00	11,00	19,78	0,00	54,60	507,25



The calculations made by the formula N-1 for the infrastructure standard show that in case of disruption of the single largest gas infrastructure, the capacity of the other existing infrastructure will be able to ensure the necessary gas quantities to satisfy the overall gas demand on the territory of the Republic of Bulgaria for a day of exceptionally high natural gas demand.

Over the past years Bulgartransgaz EAD realised a significant progress in ensuring the interconnectivity with the gas transmission systems of neighbouring countries, enhancing the transmission capacities and providing the possibility for gas supply to the country through various routes. The company relies on alternative natural gas supply routes, enabling, independently of each other, to fully satisfy natural gas demand in the country.



Construction of a pipeline network part of a high pressure gas pipeline

Bulgartransgaz EAD ensures security, reliability and free and equal access to the gas infrastructure. This is a prerequisite for the development and liberalization of the domestic gas market and the integration of the gas transmission system with the regional and the European one in order to create a single, competitive, pan-European gas market.

The supply and demand analysis, the risk assessment and the obligations of the combined gas operator to the public determine the necessary investments planned to be made in the period 2024-2033.

The investments provided for the period 2024-2033 will contribute to achieving the following key objectives:

- 1. Increase and guarantee of the technical security, safety and reliability of the gas infrastructure and compliance with the requirements for environmental protection** to satisfy the expected increased gas demand in the country and the region by:
 - Investments for reconstruction, rehabilitations and overhauls of the transmission networks including investments in the existing compressor stations, existing pipeline network infrastructure and existing gas regulation and metering stations, and in Chiren UGS;
 - Investments for construction of new facilities to the existing infrastructure necessary to enhance the efficiency of operation;
 - Investments in ancillary infrastructure, including the fibre optic network.
- 2. Providing opportunity for the development of competitive market and diversification** of the gas supply sources and routes, resulting in greater energy

independence by means of:

- Development of the connectivity allowing the access to the Southern Gas Corridor and liquefied gas terminals in the region to ensure diversification of natural gas supply sources and routes for Bulgaria, the countries of the region and Europe;
- Connection of new gas production companies in the country to the gas transmission network;
- Management systems digitalisation;

3. Ensuring the security of gas supplies to the country by means of:

- Investments in the construction of interconnections to connect the gas transmission networks located outside the territory of the country.
- Investments for expansion of the underground gas storage, both regarding the withdrawal and the injection facilities, and the capabilities for storage of larger amounts of natural gas.

4. Access of new customers to natural gas, which will contribute to improvement of the environmental, quality of life, energy efficiency and savings from cheaper fuel.

This chapter of the TYNDP constitutes structured information about the basic infrastructure planned for construction, expansion, reconstruction and modernization during the next ten years (2024-2033).

Considering the long-term period of investment planning - a ten-year period as well the inclusion in the TYNDP of the projects, for which at present no final investment decision is made and projects whose development is related to the implementation of other international projects in the gas sector, for the purpose of greater clarity the Network Development Plan has been structured into 3 main groups, defining the particular sites, timetable for their implementation and expected amount of the investments:

- Investments for which decision for implementation in the period 2024 - 2026 has already been taken - Projects for the development of the gas transmission and storage infrastructure with investment decision already taken - Table 1;
- Investments whose implementation depends on the development of international projects implemented on the territory of the country - investments for the development of the gas transmission and storage infrastructure depending on the development of international projects and third parties projects in the period 2024-2033 – Table 2;
- Projects for the development of the gas and hydrogen transport and storage infrastructure in the period 2024 - 2033 for which no investment decision has been taken but there are investment intentions for their implementation during the 10-year period - Table 3;

Additionally, item 5 of this Section provides a more detailed description of the projects of key significance to the process of liberalization, diversification of the natural gas supply sources and routes, development of the gas network in the region and contribution to the national economy.

1. NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEVELOPMENT PROJECTS IN THE PERIOD 2024 - 2026 FOR WHICH INVESTMENT DECISION HAS BEEN TAKEN

Investments for the more significant projects of the network on which a decision has been taken and which are scheduled for implementation in the period 2024 - 2026, are presented in consolidated form in Table 1. The implementation of some of the projects has commenced before 2024 or is planned to end beyond 2026. For such projects only the estimated value of

the investments during that three-year period is indicated in the Table. The funds specified represent the funding that shall be ensured by Bulgartransgaz EAD.

Table No. 1

Natural gas transmission and storage infrastructure development projects in the period 2024 - 2026 by consolidated projects	Period of the planned funds	Estimated amount of investment in thousand BGN (w/o VAT)
I. 2024-2026 RECONSTRUCTIONS, REHABILITATIONS AND OVERHAULS		
1. Investments in Compressor stations:		
Reconstructions and rehabilitations of CS Polski Senovets and CS Valchi dol	2025-2026	3,690
CS Valchi dol – repair of complex distribution switches 6 kV	2024	129
2. Investments in existing AGRSs and GRSs		
Reconstruction and modernization of AGRS and GRS: AGRS Samokov – new external power supply, AGRS Kubrat - new external power supply, GRS Strashimirovo - external power supply, GRS Pleven - own water source for fire-fighting needs, GRS Shumen - construction of a metal fence,	2024-2025	306
3. License No. Л-214-06 of 29 November 2006.		
Repair of a main gas pipeline – Northern semi-ring, by replacement of gas pipeline sections; replacement of gas pipeline section VA Kalugerovo - VA Vrachesh; replacement of gas pipeline section VA Gorni Bogrov - PF Novi Iskar	2024-2026	39,571
4. License No. Л-214-09 of 29 November 2006.		
Reconstruction of protective equipment; restoration of the ground cover of gas pipelines for Greece and Macedonia, reconstruction of pigging facilities: PF Odrintsi and PF Lozenets of TG-2 Dn 1200; Obligation to work in reversionary mode at CS Ihtiman; HDD drilling of a gas pipeline to Greece as it crosses Struma river at firefighting valve (FV) 1203-1205 (Topolnitsa village) and at FV+812 (Slivnitsa village)	2024-2026	3,594
Repair of transit gas pipeline Dn 1000 to the Republic of Türkiye in sections between CS Strandzha and the Bulgarian - Turkish border; Repair of a gas pipeline DN 1000 to the Hellenic Republic and the Republic of North Macedonia in the section between LV Yavorovo and LV Gorno Beleva; Repair by means of replacement of a	2024-2026	67,085

Natural gas transmission and storage infrastructure development projects in the period 2024 - 2026 by consolidated projects	Period of the planned funds	Estimated amount of investment in thousand BGN (w/o VAT)
section of transit gas pipeline DN 1000 to the Hellenic Republic and the Republic of North from Valve "B" at CS Ihtiman to the village of Venkovets; Replacement of a section DN 1000 of the Transit gas pipeline from CS Lozenets to the border with the Republic of Türkiye		
II. INVESTMENTS IN CONSTRUCTION OF NEW FACILITIES TO THE EXISTING INFRASTRUCTURE NECESSARY TO INCREASE THE EFFICIENCY OF OPERATION		
1. Gas transmission infrastructure		
Construction of cleaning facilities (launch and receive chambers) for gas pipeline branches Dimitrovgrad, Sevlievo, Razgrad and Plovdiv	2024 – 2025	1,320
Gas pipeline connecting Chiren UGS to the existing gas transmission network of Bulgartransgaz EAD in the area of Butan village	2024	58,900
2. Investments in auxiliary networks		
New information system for the collection, archive and visualization of technological information from Bulgartransgaz EAD gas transmission network	2024	7,500
IT commercial dispatching implementation	2024-2026	6,492
III. ACCESS OF NEW MUNICIPALITIES AND NEW END USERS TO NATURAL GAS		
1. Investments for construction of new gas metering and gas regulation stations		
Construction of new GMSs and AGRSs - purchase of existing assets to develop the gas market	2024-2026	300

2. NATURAL GAS TRANSMISSION AND STORAGE DEVELOPMENT INVESTMENTS OVER THE PERIOD 2024 – 2033 UNDER PROJECTS WITH AN INTERNATIONAL DIMENSION

The investments that depend on the development of projects of international importance, carried out on the territory of Bulgaria, are shown in Table 2.

Table No. 2

Natural gas transmission and storage infrastructure development projects in the period 2024 - 2033 by consolidated projects	Period of the planned funds	Estimated amount of investment in thousand BGN (w/o VAT)
I. PROJECTS PROVIDING THE OPPORTUNITY TO DIVERSIFY THE GAS SUPPLY SOURCES AND ROUTES		
1. Natural gas storage		
Expansion of Chiren UGS capacity – above – ground part ² and wells	2024 - 2025	366,730

The funds under item 1 represent the value of design, construction, construction supervision and buffer gas costs under signed contracts and estimated values for costs of benefits, easements, archaeology and fees. The total estimated value of the project for the Expansion of Chiren UGS capacity is approximately EUR 308 million; roughly EUR 78 million are granted from the Connecting Europe Facility.

3. NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEVELOPMENT PROJECTS IN THE PERIOD 2024 - 2033 ON WHICH FINAL INVESTMENT DECISION IS TO BE TAKEN

In order to determine the subsequent realisation of the projects listed below, preliminary studies will be carried out on the appropriateness and method of implementation and funding, principle technical solutions, scope, location, etc.

²Project of common interest in the meaning of Regulation (EU) 347/2013, included under number 6.20.2 in the fifth list of Projects of Common Interest (PCI).

Table No. 3

Natural gas transmission infrastructure development projects in the period 2024 - 2033 for which no investment decision has been taken	Period of the planned funds	Estimated amount of investment in thousand BGN (w/o VAT)
1. License No. Л-214-09 of 29 November 2006.		
1.1. Construction of a reverse flow connection line at CS Provadia	2025-2026	1 550
2. License No. Л-214-06 of 29 November 2006.		
2.1. Actions on construction of cleaning facilities /launch and receive chambers/ of gas pipeline branches for Pleven and Pazardzhik, Shumen, Novi pazar and Ispereh	2024-2027	9,490
2.2. Gas transmission pipeline with AGRS to Bansko and Razlog	2025-2028	43,645
2.3. Site High-Pressure Gas Transmission Infrastructure to Supply Consumers in the Maritsa East Basin	2024-2026	211,091
3. Total for distribution		
3.1. A draft for the increase of the technical gas transmission capacity from Greece to Bulgaria and from Bulgaria to North Macedonia in 2 options:	2024-2029	
3.1.1. Baseline option – Looping from Kulata to Kresna and gas transmission pipeline from Piperevo to Pernik	2024-2026	239,544
3.1.2. Extended option – Looping from Kulata to Kresna and gas transmission pipeline from Piperevo to Pernik, Gas transmission pipeline from Ihtiman to Gorni Bogriv and 9MW additional compressor power at CS Petrich	2024-2029	600,831
3.2. Project on increasing the technical capacity for natural gas transmission in Bulgaria-Romania direction	2024-2026	374,365
4. Hydrogen projects		
4.1. Retrofitting the existing gas transmission network to integrate hydrogen up to 10% in the network	2025-2028	857,602
4.2. The hydrogen transmission infrastructure in Bulgaria (Phase 1) part of a hydrogen interconnection between Bulgaria and Greece	2024-2029	1 682 094
4.3. The hydrogen transmission infrastructure in Bulgaria (Phase 2) to Romania	2025-2029	2 253 116

The funds under positions 2.3., 3 and 4 of Table 3 represent an estimate of the investment.

4. 2024 – 2033 INVESTMENT PROGRAM

This Section presents Bulgartransgaz EAD Investment Program for the period 2024-2033 divided into the following activities:

- **Investments** - actions aimed at the expansion, reconstruction, modernization and overhauls, grouped into three main sections:
 - Construction of new facilities;
 - Reconstruction, rehabilitation and overhauls of long-term tangible assets;
 - Delivery of machinery and equipment.

4.1. Three-year Investment Programme (2024 - 2026) including investment activities on which final investment decision has been taken

in BGN thousand, VAT excluded

Programme/Section	Total 2024	Total 2025	Total 2026
TOTAL Annual Programme for Investments:	363,700	173,181	64,593
<i>SECTION I.1 - Construction of new sites</i>	<i>317,238</i>	<i>128,397</i>	<i>2,327</i>
<i>Gas transmission network</i>	<i>59,713</i>	<i>4,701</i>	<i>941</i>
Pipeline network	59,337	1,803	0
Compressor stations, administrative and operating regions	0	789	0
Communication and information systems	265	1,996	828
AGRS and GMS	111	113	113
<i>Natural gas storage</i>	<i>243,508</i>	<i>123,222</i>	<i>0</i>
Expansion of Chiren UGS capacity	243,508	123,222	0
<i>Total for allocation by types of activities</i>	<i>14,016</i>	<i>474</i>	<i>1,386</i>
Pipeline network	0	0	0
Compressor stations, administrative and operating regions	462	92	1,330
Communication and information systems	6,054	381	56
Chief Dispatching Division	7,500	0	0
<i>SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets</i>	<i>35,680</i>	<i>37,044</i>	<i>54,025</i>
<i>Gas transmission network</i>	<i>32,886</i>	<i>34,914</i>	<i>52,361</i>
Pipeline network	32,305	33,630	48,778
Compressor stations, administrative and operating regions	263	1,241	3,583
AGRS and GMS	318	43	0
<i>Natural gas storage</i>	<i>5</i>	<i>0</i>	<i>0</i>
Main technological installations and systems, operating unit	5	0	0
<i>Total for allocation by types of activities</i>	<i>2,789</i>	<i>2,129</i>	<i>1,665</i>
Pipeline network	2,777	1,700	0
Compressor stations, administrative and operating regions	0	429	1,665

Communication and information systems	12	0	0
<i>SECTION I.3 - Supply of machinery and equipment</i>	<i>10,783</i>	<i>7,740</i>	<i>8,240</i>

4.2. 2027-2033 Investment programme, including mandatory investment activities ensuring capacity capabilities of the networks

in BGN thousand, VAT excluded

Programme/Section	Total	Total	Total	Total	Total	Total	Total
	2027	2028	2029	2030	2031	2032	2033
TOTAL Annual Programme for Investments:	26,127	27,558	28,036	29,563	30,141	31,273	32,462
SECTION I.1 - Construction of new sites	16,191	17,001	17,851	18,743	19,680	20,664	21,697
SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets	2,436	2,558	2,686	2,820	2,961	3,109	3,264
SECTION I.3 - Supply of machinery and equipment	7,500	8,000	7,500	8,000	7,500	7,500	7,500

5. DESCRIPTION OF KEY PROJECTS

In the context of the European objectives of building an interconnected and single pan-European gas market, the development of infrastructure in the Republic of Bulgaria is directly related to the positioning of the country as one of the gas hubs in Eastern Europe in line with the plans for gas infrastructure development in the region and Europe. Along with the efforts that Bulgartransgaz EAD makes to achieve the pan-European goals for improving the security of supply, diversification of natural gas supply sources and routes, the Company actively participates in the current processes for adapting the energy sector in accordance with the plans to achieve of energy decarbonisation and climate neutrality according to the European energy policy.

The following projects will be key for the market integration, diversification and enabling the transport of additional natural gas quantities to and through Bulgaria:

- Expansion of Chiren UGS capacity;
- the LNG terminal near Alexandroupolis.
- Infrastructure development projects for the increase of the transmission capacities from Greece to Bulgaria and from Bulgaria to Romania in the context of the verticla Gas Corridor;
- The project for high-pressure gas transmission infrastructure to supply consumers in

the Maritsa East Basin.

The next year will see the natural gas keeping its key role in the process achieving the decarbonisation objectives. The available gas transmission infrastructure provides an opportunity for the successful and accelerated introduction of hydrogen into the energy mix, and the plans for the construction of a new hydrogen transmission infrastructure will guarantee the large-scale development of the energy sector in the country. This concept is embedded in defining the projects that will contribute to the transition to low carbon energy. Solutions for preparation of the existing gas transmission network for compatibility with the inclusion of hydrogen and other low-carbon gases in the network, as well as for completely new routes for green hydrogen transmission are being considered that may potentially become the future hydrogen corridor in the region of South East Europe.

Bulgartransgaz EAD is developing the following hydrogen projects:

- Hydrogen transmission infrastructure in Bulgaria (in 2 phases);
- Retrofitting of the existing Bulgarian gas transmission network and associated network assets to effectively integrate low carbon and renewable gases.

The implementation of the projects accounts for the development of strategies and policies regarding the hydrogen infrastructure at regional and pan-European level is taken into account. Detailed information is available in 5.2 below.

5.1. Key projects for the development of the gas infrastructure

The gas infrastructure development concept is based on several key factors:

- New natural gas sources;
- Optimal use of the existing gas transmission networks and Chiren UGS;
- - Modernization and expansion of the existing infrastructure;
- Building new, expansion of existing interconnection with neighbouring countries and network development to new exit points in the country;
- Optimal trade environment through a liquid gas exchange.

At the end of 2023, with the commissioning of **Interconnection Bulgaria-Serbia**, Bulgaria will have access to the LNG terminals in Croatia, as well as to the largest liquid market and storage facility in Central Europe - Baumgarten in Austria. In addition to contributing to the security and diversification of the gas supplies, the interconnection also enables the development of the industrial gas consumption.

A number of projects in the field of transport and storage of natural gas and infrastructure for liquefied natural gas are under implementation, which are important for the development of the natural gas market in the country and the region.

Bulgartransgaz EAD involvement in **Alexandroupolis Independent Natural Gas System (INGS)** has a strategic importance as it will provide additional natural gas quantities to the gas markets in the region by offering access to reliable sources such as the US, Egypt and others. Through the existing and envisaged gas pipelines in the region, natural gas from the terminal will be delivered to consumers both in Bulgaria, and in North Macedonia, Serbia, Romania, Hungary, Moldova and Ukraine, providing them with the opportunity to benefit from the dynamically developing LNG market and the advantages it offers - flexibility, competitiveness and security of supply and access to new gas suppliers.

Commissioning of the **Alexandroupolis terminal** will strengthen the role of LNG in the region's sustainable natural gas supply and improve the access to the global LNG market.

All possibilities for Bulgartransgaz EAD shareholding in a second LNG terminal in the region are studied.

The expansion of Chiren UGS is aimed at establishing conditions to guarantee the security of supply to Bulgarian customers and the customers on the countries from the region. The expansion of storage capacity is in full compliance with EU policies to ensure security of supply and strengthen solidarity between member states.

Chiren UGS will play an important role for the region not only in terms of reserve in case of a cut in the supplies but as a commercial storage facility. Providing additional storage volume will promote natural gas trade, increase market competition and contribute to liquid gas market functioning. The expansion of Chiren UGS is in synergy with all projects of the Company, including the project for LNG terminal near Alexandroupolis.

The **Vertical Gas Corridor** is a strategic project for ensuring security of supply and diversification of natural gas supplies to Bulgaria and the countries of South-Eastern, Eastern and Central Europe.

The concept of the project is based on the maximum utilization of the possibilities of the existing gas transmission networks along the corridor and making optimal investments of the participating parties in an additional infrastructure, which will allow the transport of the increasing quantities of LNG from the LNG terminals in Greece and Türkiye.

The projects that Bulgartransgaz EAD develops to increase the **transmission capacities from Greece to Bulgaria and from Bulgaria to Romania** are a key part of the overall vision of the Vertical Corridor, and their implementation and the infrastructure already available in the country are the basis for achieving the set objectives for diversification and improving the security of supply.

The increase of gas transmission capacities at the interconnection points of the gas transmission networks of Greece, Bulgaria, Romania, Hungary, Slovakia, Ukraine and Moldova is of key importance for achieving the energy security of the countries of South-Eastern, Eastern and Central Europe.

The strategic route of the Vertical Gas Corridor Initiative will ensure access to additional quantities of LNG for consumers. Concerning the projects that will be implemented on the territory of Bulgaria for the increase of the capacities from Greece to Bulgaria and from Bulgaria to Romania will ensure the technical possibility for the transport of the additional quantities of natural gas, including from the Southern Gas Corridor and liquefied natural gas from terminals in neighbouring countries with the maximum use of the possibilities of the existing infrastructure.

The construction of a **high-pressure infrastructure to supply customers in the the Maritsa East Coal Basin** is an important project for the development and expansion of the gas infrastructure of Bulgartransgaz EAD.

The realisation of the project will create the conditions for the modernization of the combustion installations of thermal power plants and other energy users, for introducing lower-emission fuels in the energy mix, and a significant reduction of greenhouse gas



emissions from combustion processes. The implementation of the project will contribute to meeting the decarbonisation objectives of the energy sector, the transition to new low carbon technologies and increasing the energy security, namely the development of gas transmission infrastructure in the Maritsa East Basin.


The project will lead to a flexible and efficient operation of the plants following their modernisation. This in turn will have a positive social impact as it will allow jobs to be held down in the region.


With Decision No. 133 of 23 February 2024 of the Council of Ministers of the Republic of Bulgaria, the projects for the increase of the transmission capacities from Greece to Bulgaria and from Bulgaria to Romania and for Gas Transmission Infrastructure to Supply Consumers in Maritsa East Basin have been declared national sites and sites of national importance.

In confirmation of the importance of the projects, the 49th National Assembly adopted a decision on 14 March 2024 to take action in relation to the Vertical Corridor initiative of the gas transmission operators of Bulgaria, Greece, Romania, Hungary, Slovakia, Ukraine and Moldova, providing the opportunity for the transmission of additional volumes of natural gas from various and reliable sources in the south-north direction and the Updated Roadmap for Climate Neutrality of the Republic of Bulgaria, adopted by Decision No 59 of 26 January 2024 of the Council of Ministers, through the expansion of the gas transmission infrastructure of Bulgartransgaz EAD and the implementation of the three projects, published in OJ, No.23 of 19.03.2024.

The decision of the National Assembly acknowledges the projects' significance and the need for their timely implementation.

Expansion of Chiren UGS capacity	
 Co-funded by the European Union	
Project identification in lists: Expansion of Chiren UGS capacity (PCI 6.20.2 in the Fifth list of Projects of Common Interest) CESEC priority project Chiren UGS was declared a site of national importance, according to Decision No. 755/21.09.2004 and a national site, according to Decision No. 709/14.10.2021 of the Council of Ministers. Gas pipeline connecting Chiren UGS with the existing gas transmission network of Bulgartranzgaz EAD was declared a national site and a site of national importance, according to Decision No. 528/02.08.2023 of the Council of Ministers.	
Type of project: Underground Gas Storage	
Description of the Project: Chiren UGS expansion - increase in the active gas volume up to 1 bcm and increase in the injection and withdrawal capacity up to 8-10 mcm/d. Technical data: - Above-ground part: Compressor equipment with auxiliary equipment, GMS, separation installations, heating and dehydration, etc. - Wells: 10 exploitation and 3 observation wells, gatherings, auxiliary activities, etc. - Gas pipeline connecting Chiren UGS to the existing gas transmission network of Bulgartranzgaz EAD of ~41 km length and DN700.	
Expected amount of the investment: ~ EUR 308 million, VAT excluded.	Funding: 1. Bulgartranzgaz EAD own funds; 2. Co-financing from the Connecting Europe Facility (CEF) in the amount of about EUR 78 million (Project 101069718 — 6.20.2-BG-W-M-21-Chiren-UGS-Expansion).
Expected commissioning date:	2024
Project phase:	Implementation of design, deliveries and construction and installation works
Current status of project implementation: Above-ground facilities: - 07/2023: Commencement of construction works. The deliveries of equipment and the execution of construction and installation works are ongoing Wells: - A draft DSP-PP has been approved and the locations of the new wells - determined. An investment design - detailed design phase is being developed. Gas pipeline: - Construction permits have been issued for all site stages. Deliveries and construction and installation works are being carried out at all stages.	
Expected benefits: Ensuring the security of supply; Increasing market integration; Stimulation of market competition; Promotion of gas trade in the region; Contribution to the implementation of the energy transition and reduction of emissions; Contribution to the introduction of gas from alternative sources, including LNG.	
Project website: https://www.bulgartranzgaz.bg/chiren	

The Alexandroupolis Independent Natural Gas System (INGS)	
Project identification in lists: CESEC priority project	
Type of project: Floating terminal for reception, storage and re-gasification of LNG	
<p>Description of the Project: It will be located 17.6 km southwest from the port of Alexandroupolis and about 10 km from the shore. The facility will be connected to the national gas transmission system of Greece and the Bulgarian gas transmission system via the existing IP Kulata/Sidirocastro and the Inetrconnector Bulgaria –Greece (IGB).</p> <p>Technical data: Floating terminal for reception, storage and re-gasification of LNG Design capacity of regasification and supply to the Greek gas transmission system: 5,5 bcm/y Design storage capacity: 153.5 thousand cu m</p>	
Expected commissioning date:	2024
Project phase:	Execution of construction works
Current status of project implementation: Commissioning activities	
Expected benefits: Strengthening the diversification of the sources of natural gas to the region; Enhancing the security of supply for the region; Stimulating the competition in favour of the end consumers; Enhancing market integration for a single interconnected regional and pan-European market.	
Contractor of the project is Gastrade S.A. Bulgartransgaz EAD has a 20% shareholding in Gastrade S.A. In accordance with Decision No. 6/08.01.2020 of the Council of Ministers	
Project website: http://www.gastrade.gr/	

Rehabilitation, modernization and expansion of the Bulgarian gas transmission system - Phase 3	
Project identification in lists: Project for Rehabilitation, modernization and expansion of the Bulgarian gas transmission system (PCI 6.8.2 in the Fifth list of Projects of Common Interest) CESEC priority project	
Type of project: High pressure gas pipeline and auxiliary facilities	
Technical data (Phase 3): New gas pipeline Gorni Bogrov - Novi Iskar of 19 km length, DN 700; New Compressor station Bogrov - 20 MW.	
Expected commissioning date:	The realisation of the investment depends on decisions to be made regarding the increase of capacity of the Interconnection Bulgaria - Serbia (IBS)
Project phase:	Planning
Expected benefits:	The increase of capacity of the Interconnection Bulgaria - Serbia (IBS) from 1,8 to 3,2 bcm/y.
Project website: https://www.bulgartransgaz.bg/rehabilitaciya	

Project for increase of the transmission capacity at Interconnection point Negru Voda 1/Kardam in Bulgaria-Romania direction

Project identification in lists:

Project TRA-N-1124, TYNDP2022 of ENTSOG

National site and site of national significance in accordance with Decision No. 133 of 23.02.2024 of the Council of Ministers

Type of project: High pressure gas pipeline and auxiliary facilities

Description of the Project: Increasing the technical capacity for natural gas transmission in direction from Bulgaria to Romania at Interconnection point IP Negru Voda 1/Kardam.

Technical data:

Looping from Rupcha to Vetrino of about 61 km approximate length, DN1200

Activities related to reversing Compressor station (CS) Kardam (without need for new compressors) and expansion of its control system capacity

Incremental capacity from Bulgaria to Romania: 137.2 GWh/d



Expected amount of the investment:

~ 191.4 million €

Expected commissioning date:

The beginning of 2026

Project phases:

Pre-project activities

Current status of project implementation:

Public procurement in accordance with the Public Procurement Act (PPA) for spatial planning, investment design, supply of the necessary materials and equipment, construction and commissioning of site Looping from Rupcha to Vetrino;

- Public procurement under the PPA for investment design, supply of the necessary materials and equipment, construction and commissioning of site: Reversal and expansion of the capacity of Compressor Station Kardam control system

- Carrying out a procedure under the Spatial Development Act for coordination of the Terms of reference (ToR) for development of DSP - PP for site Looping from Rupcha to Vetrino

Expected benefits:

Improving the interconnectivity between Bulgaria and Romania;

A strategic route to provide access to additional LNG quantities and gas from alternative sources for the region;

Key infrastructure for the Vertical Gas Corridor.

A project to increase the transmission capacity at Interconnection point IP Kulata/Sidirokastro in Greece-Bulgaria direction

Project identification in lists:

Project TRA-N-1140, TYNDP2022 of ENTSOG

National site and site of national significance in accordance with Decision No. 133 of 23.02.2024 of the Council of Ministers

Type of project: High pressure gas pipeline and auxiliary facilities

Description of the Project: Increasing the technical capacity for natural gas transmission in direction from Greece to Bulgaria at Interconnection point IP Kulata/Sidirokastro.

Technical data (baseline option):

Includes: Looping from Kulata to Kresna of 48 km approximate length, DN 700 and High pressure gas pipeline from Piperevo to Pernik of 53 km approximate length, DN 500.

Incremental capacity from Greece to Bulgaria: 35.4 GWh/d

Technical data (extended option):

Looping from Kulata to Piperevo of 132 km approximate length, DN 700;
 A high pressure gas pipeline from Piperevo to Pernik of 53 km approximate length, DN 500;
 A high pressure gas pipeline from Ihtiman to G. Bogrov of 50 km approximate length, DN 700;
 Installation of additional 9 MW GTCU at CS Petrich and reconstruction;
 Reversing of CS Ihtiman

Incremental capacity from Greece to Bulgaria: 104,4 GWh/d

Project implementation will also enable increase in the transmission capacity at IP Kyustendil/Zhidilovo from Bulgaria to North Macedonia by 5,383 GWh/d.



Expected amount of the investment:

Baseline option: ~ 122.5 million €
 Extended option: ~ 307.2 million €

Estimated commissioning date:

Baseline option: The beginning of 2026
 Extended option: 2029

Project phase:


Pre-project activities

Current status of project implementation:

- Public procurement in accordance with the Public Procurement Act (PPA) for spatial planning, investment design, supply of the necessary materials and equipment, construction and commissioning of sites Looping from Kulata to Kresna and Gas transmission pipeline from Piperevo to Pernik
- Carrying out a procedure under the Spatial Development Act for coordination of the Terms of reference (ToR) for development of DSP - PP for both sites

Expected benefits:

Improving the interconnectivity between Bulgaria and Greece;
 A strategic route providing access to additional LNG quantities and gas from alternative sources for Bulgaria and the region;
 Key infrastructure for the Vertical Gas Corridor.

Project for High-pressure gas transmission infrastructure to supply consumers in Maritsa East Basin	
Project identification in lists: Project TRA-N-1170, TYNDP2022 of ENTSOG National site and site of national significance in accordance with Decision No. 133 of 23.02.2024 of the Council of Ministers	
Type of project: High pressure gas pipeline and auxiliary facilities	
Description of the Project: High-pressure gas transmission infrastructure to supply consumers in Maritsa East Basin. Technical data: New high-pressure gas pipelines of about 73 km approximate total length, a diameter DN 700 and DN 500 and their auxiliary technological facilities	
Expected amount of the investment:	~ 107.9 million €
Expected commissioning date:	The beginning of 2026
Project phases:	Pre-project activities
Current status of project implementation: Public procurement under the PPA for Spatial Planning and Preparation of an Investment Design - Technical Design Phase for Site - Gas Transmission Infrastructure to Supply Consumers in Maritsa East Basin.	
Expected benefits: Significant contribution to decarbonisation of the energy sector in Bulgaria; Economic and environmental benefits for the region.	

5.2. Development of the hydrogen infrastructure plans in the light of green transition.

The significant potential of the Eastern Mediterranean region and South East Europe for both green hydrogen production and its import from reliable partners will encourage the investments in hydrogen infrastructure. Bulgartransgaz EAD and the Greek transmission operator DESFA S.A. are already working on the interconnection of entirely new hydrogen networks, synchronizing their decisions regarding the concepts of two hydrogen projects.

With the approval of the European Commission, the project for hydrogen transport infrastructure on the territory of Bulgaria was granted the status of a project of pan-European interest and was included in the First list of Projects of Common Interest (PCI) and projects of mutual interest (PMI) of the EC, published on 28.11.2023. The project objective is to establish a hydrogen transmission network in Bulgaria with possibility of transmission from/to Greece, with connectivity to a similar hydrogen infrastructure on Greek territory, with operator DESFA S.A. The planned infrastructure will subsequently be developed on the territory of Bulgaria and will provide additional cross-border connectivity, including with Romania. Options are being developed to further expand the H2 infrastructure both, internally and to cross-border interconnection points with Romania and other neighbouring countries.

The projects for hydrogen transmission infrastructure on the territory of Bulgaria are part of the scenarios for development of the hydrogen networks of the EHB, as well as part of a regional initiative for construction of the South East Hydrogen Corridor (SEEHyC).

The retrofitting project of the existing gas transmission network also has the potential to acquire a status of key European infrastructure. Its aim is to create opportunities to integrate and transport renewable gas mixtures in concentrations of up to 10% hydrogen. Activities are planned to implement the necessary equipment, installations and solutions and to convert the existing gas transmission network into a smart one, which will allow the management and monitoring of mixed gas flows. Functional connectivity of the project with a similar project in Greece has been envisaged.

The main objective of the hydrogen projects being developed is, on the one hand, gradual decarbonisation of the gas sector and, on the other hand, providing the possibility to transport and use low-carbon gases on the territory of Bulgaria.

Hydrogen transmission infrastructure in Bulgaria (Phase 1)

Project identification in lists:

PCI 10.3.2 Internal hydrogen infrastructure in Bulgaria towards the border with Greece

Part of the EHB H2 network development scenarios

Part of the South East Hydrogen Corridor development scenarios under the ECH2A initiative

Part of the SEEHyC regional initiative

Type of project: H2 infrastructure and adjacent facilities

Project description: New H2 infrastructure on the territory of Bulgaria, suitable for transporting up to 100% hydrogen. The project is being developed in coordination with a H2 infrastructure project on the territory of Greece, with operator DESFA, and will create conditions for a bidirectional cross-border H2 transmission between Bulgaria and Greece at a new connection point in Kulata/Sidirokastro region.

Technical data:

New pipeline with a length of approximately 250 km, DN1000

Two new compressor stations - in the region of Petrich and Dupnița.

Start point: Sofia Region, Republic of Bulgaria

End point: Sidirokastro region, Republic of Greece



Expected amount of the investment:

~ EUR 860 million, VAT excluded

Expected commissioning date:

2029

Project phase:

Planning

Expected benefits:

Contributes to sustainable economic growth;

Creates conditions for phasing out fossil fuels;

Contributes to national and European decarbonisation and carbon neutrality targets by 2050;

Important part of a future hydrogen corridor from South East to Central Europe.

Hydrogen transmission infrastructure in Bulgaria (Phase 2)

Project identification in lists:

Applied for inclusion in the second PCI list under the new TEN-E Regulation (EU/2022/869)
 Part of the EHB H2 network development scenarios
 Part of the South East Hydrogen Corridor development scenarios under the ECH2A initiative
 Part of the SEEHyC regional initiative

Type of project: H2 infrastructure and adjacent facilities

Project description: New H2 infrastructure on the territory of Bulgaria, suitable for transporting up to 100% hydrogen. The new infrastructure is Phase 2 of the hydrogen interconnector between Bulgaria and Greece (H2T-A-788). The project will provide conditions bi-directional cross-border H2 transmission between Bulgaria and Romania at a new hydrogen connection point in the region of Ruse/Giurgiu.

Technical data:

New pipeline of approximately 330 km length, DN1000

Three new compressor stations

Start point: Sofia district (Novi Iskar), Republic of Bulgaria

End point: the region of Ruse/Giurgiu, Republic of Bulgaria/Romania



Expected amount of the investment:

~ EUR 1152 million, VAT excluded

Expected commissioning date:

2029

Project phase:

Planning

Expected benefits:

Contributes to sustainable economic growth;
 Supports the process of large-scale hydrogen implementation, both in Bulgaria and in the region of South-East Europe.
 Contributes to national and European decarbonisation and carbon neutrality targets by 2050;
 Important part of a future hydrogen corridor from South East to Central Europe.

Retrofitting the existing gas transmission network and associated network assets to effectively integrate low carbon and renewable gases

Project identification in lists:

RET-N-558, ENTSOG TYNDP2022 (*initial project idea*)

Applied for inclusion in the second PCI list under the new TEN-E Regulation (EU/2022/869)

Part of the EHB H2 network development scenarios

Project type: Technologies integration, ICT management systems, technical modification of network elements

Project description: Upgrading the existing gas transmission infrastructure with the necessary facilities, digital elements, installations and solutions to create possibilities to integrate and transport renewable gas mixtures in concentrations up to 10% hydrogen. Introduction of intelligent systems for transmission monitoring, control and management.

Technical data:

The construction of a smart gas grid will affect the entire existing gas transmission infrastructure. Specific activities will be set following the completion of the envisaged studies.



Expected amount of the investment:

~ EUR 438 million, VAT excluded

Expected commissioning date:

2027

Project phase:

Studies

Expected benefits:

Reducing greenhouse gas emissions; Achieving gradual decarbonisation of the energy sector and the economy, and providing conditions to boost the competitiveness of industry;
 Improving the flexibility and efficiency of the gas transmission system;
 Guaranteed interoperability between the Bulgarian gas transmission network and the Greek gas transmission network managed by DESFA S.A.

5.3. Other Bulgartransgaz EAD infrastructure development projects

5.3.1. Interconnection Bulgaria – North Macedonia

The project is in a conceptual phase and envisages the construction of a new gas interconnection between the Republic of Bulgaria and the Republic of North Macedonia following the route Petrich - Strumitsa.

The development of interconnectivity between Bulgaria and North Macedonia will boost energy security and contribute to further energy market integration.

In this regard the following documents have been signed:

- Memorandum of Understanding and cooperation in the field of natural gas between the Ministry of Energy of the Republic of Bulgaria and the Ministry of Economy of the Republic of North Macedonia
- Agreement between Bulgartransgaz EAD and Macedonian Energy Resources Joint Stock Company (currently "NOMAGAS AD Skopje") for carrying out a feasibility study on the construction of a new gas interconnection between the Republic of Bulgaria and the Republic of North Macedonia.

The Parties debate the organisation of a market test for the project with a view to deciding on its realisation.

5.3.2. Development of the existing network by construction of new gas pipeline branches

The development of the existing network is an essential process in terms of creating opportunities to achieve a sustainable environment favourable to the development of industry and the economy. Besides supporting the economy, the gas transmission network expansion in new regions is directly related to development of the respective regions - in business and social aspect. Providing access to a sustainable and environmentally friendly energy source such as the natural gas, creates an opportunity for gasification of new settlements, increasing the competitiveness of economic entities and subsequently reducing GHG and pollutant emissions by replacing traditionally used solid and liquid fuels. In this context, the project for high-pressure gas transmission infrastructure to supply consumers in Maritsa East Basin is particularly important, as it has the potential to make a significant contribution to the transition to decarbonisation of these regions.

5.4. Major projects for gas infrastructure reconstructions, rehabilitations and overhauls

5.4.1. Overhauls of sections of the gas transmission network

The carried out maintenance activities of the gas pipeline network during its operation found out various types of defects, most of which related to metal loss. Repairs are carried out in a timely manner to restore the gas pipelines' strength characteristics and replace their anti-corrosion coating, according to the prescribed repair programmes. Sections of ДУ 1000 gas transmission pipelines to the Republic of Türkiye, the Republic of

Greece and the Republic of North Macedonia and of the main gas pipeline - northern semi-ring are planned to be replaced.

5.4.2. Overhauls of gas turbine engines and scheduled maintenance and inspections of GTCUs

All gas turbine engines (GTE) have the so-called **between overhaul resource** in working hours (resource until inspection) and **general technical resource** in working hours which are in line with the respective operational documents and the aim is to ensure the operational reliability, safety, efficiency and preservation of the operational parameters of the GTE.

Following expiry of the between overhaul resource or in case of failure of the equipment during operation, an overhaul shall be carried out to recover the mechanical, environmental and gas dynamic parameters, as well as to ensure its safe and reliable operation in the future (following the overhaul) working hours until reaching the general technical resource.

5.4.3. Construction of pigging facilities (launch and receive chambers) for gas pipeline branches Razgrad, Sevlievo, Dimitrovgrad and Plovdiv

Currently there are no pigging facilities installed on these branches. The construction of launch and receiving traps will enable regular cleaning and in-line inspections to track the actual operating state of the transmission gas pipelines without any need of gas flow interruption and the maintenance of the design pressure as well.

In 2023, implementation commenced of the spatial planning and investment design activities for the pigging facilities of the gas pipeline branches to Plovdiv and Razgrad.

**DEVELOPMENT OF THE CAPACITY OF BULGARTRANSGAZ EAD GAS
INFRASTRUCTURE IN THE PERIOD 2024-2028**

The planned activities for the period 2024-2028 will ensure the adequacy of Bulgartransgaz EAD infrastructure in connection with the efforts of Bulgaria and the countries of the region to diversify the natural gas supply sources and routes.

Estimated capacities for the period 2024 -2028

As of 1 January, MWh/d	2024	2025	2026	2027	2028
Entry capacity	1,351,858	1,359,418	1,459,060	1,466,620	1,474,180
IP Strandzha 2/Malkoclar	584,107	584,107	584,107	584,107	584,107
IP Strandzha/Malkoclar	117,677	117,677	117,677	117,677	117,677
IP Negru voda 1	214,418	214,418	214,418	214,418	214,418
IP Ruse/Giurgiu	43,817	43,817	43,817	43,817	43,817
IP Stara Zagora	122,313	122,313	178,995	178,995	178,995
IP Kalotina/Dimitrovgrad	7,776	7,776	7,776	7,776	7,776
GMS Chiren	41,256	48,816	56,376	63,936	71,496
Local Production	26,000	26,000	26,000	26,000	26,000
IP Kulata/Sidirokastro	66,576	66,576	101,976	101,976	101,976
IP Kireevo/Zaycar	342,336	342,336	342,336	342,336	342,336
Exit capacity	1,661,903	1,669,463	1,716,377	1,861,137	1,868,697
IP Negru voda 1/Kardam	157,771	157,771	157,771	294,971	294,971
Exit zone Bulgaria	294,946	294,946	324,120	324,120	324,120
IP Ruse/Giurgiu	26,735	26,735	26,735	26,735	26,735
IP Stara Zagora	23,320	23,320	23,320	23,320	23,320
IP Kalotina/Dimitrovgrad	53,244	53,244	53,244	53,244	53,244
IP Kulata/Sidirokastro	120,363	120,363	130,543	130,543	130,543
Kyustendil/Zhidilovo	33,281	33,281	33,281	33,281	33,281
IP Kireevo/Zaycar	406,524	406,524	406,524	406,524	406,524
IP Strandzha/Malkoclar	504,139	504,139	504,139	504,139	504,139
GMS Chiren	41,580	49,140	56,700	64,260	71,820

CONCLUSION

Bulgartransgaz EAD is a company, operating in a dynamically changing environment. It develops efficiently the natural gas transmission and storage infrastructure in Bulgaria in line with the national, regional and European priorities, targets and strategies to achieve security, stability, diversification, market integration, competition and liberalisation.

Natural gas will play an important role as a transition fuel to achieve the EU's 2030 greenhouse gas reduction targets and a climate-neutral economy. Gas infrastructure will play a key role in efficiently introducing renewable and low-carbon gases in the energy system, decarbonisation and achieving carbon neutrality by 2050.

The priority infrastructure development activities of Bulgartransgaz EAD for the period 2024-2033 are:

- Maintenance of technically operational, reliable and efficient main and auxiliary gas infrastructure;
- Modernization, rehabilitation and expansion of the existing gas transmission networks and equipment;
- Development of the interconnectivity;
- Increase in transmission capacities;
- Expansion of the natural gas storage, injection and withdrawal capacity;
- Retrofit the gas infrastructure to operate with hydrogen up to 10%;
- Build new infrastructure for clean hydrogen transmission.

In the period 2024-2033, important projects are envisaged to be implemented that will provide an additional opportunity to ensure the energy security and diversification of natural gas supply sources and routes for Bulgaria and the region.

By implementation of Bulgartransgaz EAD's plans, the Bulgarian gas infrastructure will connect the common European natural gas market with the markets in the Caspian region, Central Asia, the Middle East and the Eastern Mediterranean basin.

Directly related to the intentions for development of the gas infrastructure in the region are also the plans for expansion of the existing gas storage facility Chiren and the modernization and rehabilitation of Bulgartransgaz EAD's gas transmission network. The implementation of the company's projects is interrelated and will contribute to the efficiency and development of the single pan-European gas network.

A priority in the investment activity of Bulgartransgaz EAD is the construction of new gas pipeline branches in order to create conditions for acceleration of the gasification in the country with the corresponding benefits for the locals in economic, social and environmental terms. Projects for the construction of an infrastructure for the transport of hydrogen and low-carbon gaseous fuels are envisaged as well.

The expected result of the implementation of this Plan is a significant increase in the quality and volume of services offered by Bulgartransgaz EAD related to natural gas transport and storage. The implementation of the planned activities is directly related to Bulgaria's transformation into a significant regional gas hub, creating technical opportunities for the

entry and exit of natural gas flows from various sources along new routes, contributing to the development of a competitive gas market in the region.

The TYNDP implementation will strengthen the successful business model of the Company, and in a national and regional aspect, the gas operator will continue to ensure the reliable natural gas transmission and storage both to the public and the industry, applying the best business practices.

SOURCES USED

- Draft Strategy for Sustainable Development of the Republic of Bulgaria to 2030 with a Horizon to 2050.
- Integrated plan in the field of energy and climate of the Republic of Bulgaria updated 2024
- National Recovery and Resilience Plan
- EU Hydrogen Strategy
- Strategy for Energy Systems Integration
- Ministry of Energy of the Republic of Bulgaria (www.me.government.bg)
- Energy and Water Regulatory Commission(<https://www.dker.bg/>)
- National Statistical Institute - GDP, PEC, EEC and other data (www.nsi.bg)
- Data on natural gas consumption (<https://ec.europa.eu/eurostat>)
- National energy balance of the Republic of Bulgaria
- List of Projects of Common Interest, website of the European Commission, DG Energy, (www.ec.europa.eu)
- [Reports on the State of the Energy Union](http://www.ec.europa.eu) (www.ec.europa.eu)
- Public information related to the development of the gas market in the region, published on the following web pages:
 - Bulgargaz (www.bulgargaz.bg)
 - Bulgartransgaz EAD (www.bulgartransgaz.bg)
 - Bulgarian Energy Holding (www.bgenh.com)
 - NOMAGAS AD (nomagas.com.mk)
 - ANRE - National Energy Regulatory Authority (www.anre.ro)
 - Balkan Gas Hub (www.balkangashub.bg)
 - BOTAS (www.botas.gov.tr)
 - CEPA - (www.cepa.org)
 - Delek Drilling (www.delekdrilling.co.il)
 - DEPA S.A. (www.depa.gr)
 - DESFA S.A. (www.desfa.gr)
 - Energean Oil & Gas (www.energean.com)
 - ENTSOG (www.entsog.eu)
 - ETKILIMAN – (www.etkiliman.com.tr)
 - Gastrade (www.gastrade.gr)
 - HRADF (www.hradf.com)
 - ICGB AD (www.icgb.eu)
 - IGI Poseidon (www.igi-poseidon.com)

- IGU (<https://www.igu.org/>)
- ITGI (www.edison.it)
- JP Srbijagas (www.srbijagas.com)
- LNG Hrvatska (www.lng.hr)
- Ministry of Foreign Affairs - Türkiye's Energy Profile and Strategy (www.mfa.gov.tr)
- Prometheus Gas (www.prometheusgas.gr)
- Romgaz (www.romgaz.ro)
- Shah Deniz (www.bp.com)
- TAP (www.trans-adriatic-pipeline.com)
- Transgaz S.A. (www.transgaz.ro)
- o Information related to natural gas production in Bulgaria, webpage Petroceltic International Plc (former Melrose Resources), (www.petroceltic.com)
- o 2024 - 2028 Business Programme of Bulgartransgaz EAD
- o Regional Investment Plan 2021 Central and Eastern Europe (www.entsog.eu)
- o Regional Investment Plan 2021 South Corridor (www.entsog.eu)
- o 2020 ENTSOG Ten-Year Network Development Plan (www.entsog.eu)
- o EIA – U.S. Energy Information Administration (www.eia.gov)
- o IEA - International Energy Agency – Report 2022 (www.iea.org)
- o IENE – Institute of Energy for South–East Europe (www.iene.eu)
- o GIE – Gas Infrastructure Europe (www.gie.eu)
- o Ministry of Energy and Natural Resources – Republic of Türkiye (www.enerji.gov.tr)
- o IICEC – Istanbul International Center for Energy And Climate (<https://iicec.sabanciuniv.edu/>)
- o NER JSC Skopje - Macedonian Energy Resources Skopje (www.mer.com.mk)
- o Consilium Europa – (www.consilium.europa.eu)

ANNEX 1

Key projects for new gas pipelines, reconstruction of existing gas pipelines and compressor stations and for storage capacity increase on the territory of the country and their connection to the existing gas transmission network

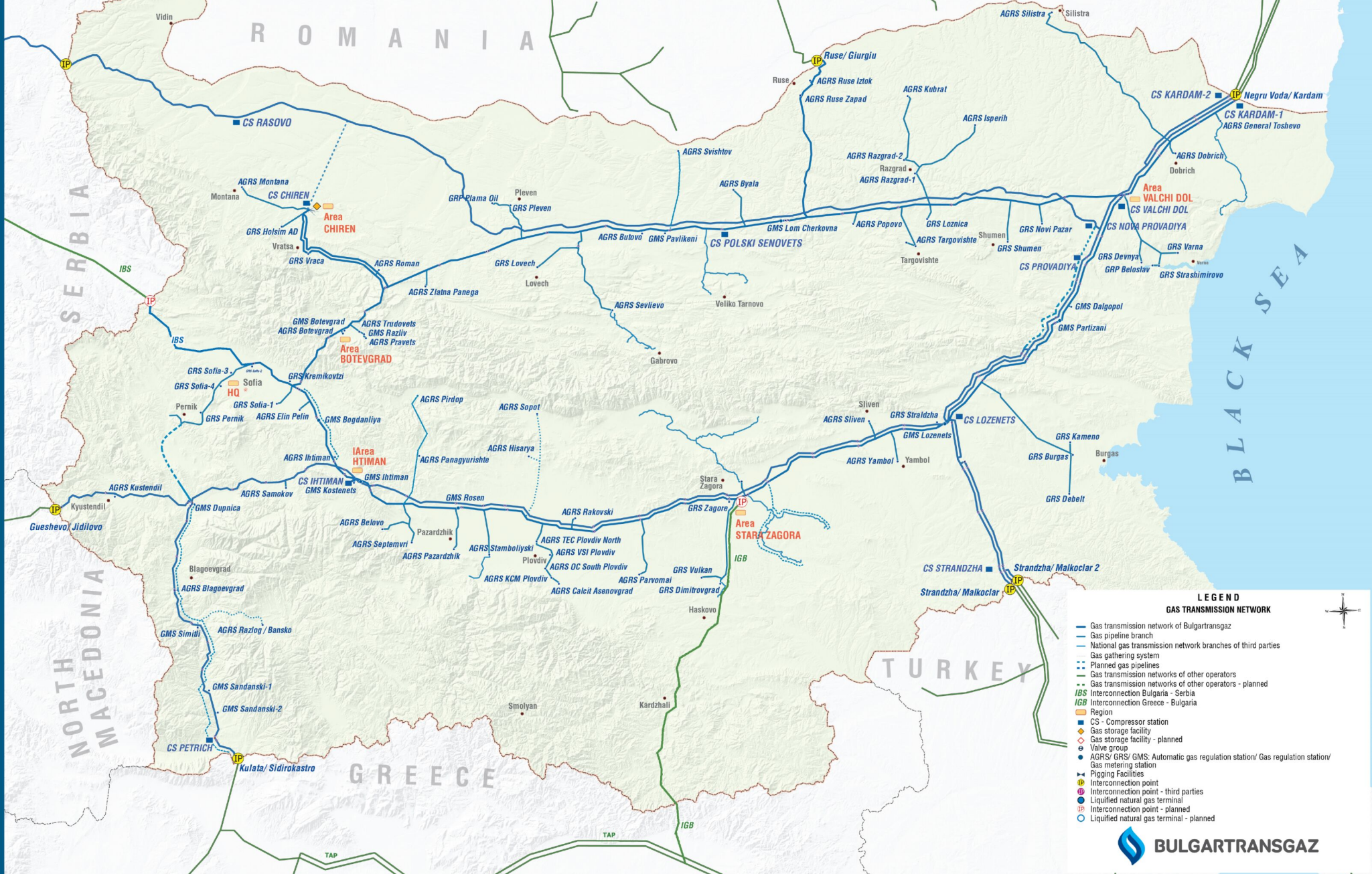
No.	Project	Final Investment Decision (FID)	Deadline for completion	Contractor	Expected value of the investment (excluding VAT)	Financing	Infrastructure	Capacity
I. Projects contributing to implementation of the Balkan Gas Hub concept								
1	Capacity increase of Chiren UGS	yes	2024	Bulgartransgaz EAD	~ 308 million €	own and attracted external funding	Above-ground facilities (CS, GMS, etc.); Gas pipeline ~ 41 km; Wells	Increase of the working gas volume up to 1 bcm and increase of the withdrawal and injection capability up to 8-10 mcm/d
3	LNG terminal near Alexandroupolis	yes	2024	Gastrade S.A.	~ 33,5 million € ¹	own and attracted external funding	Floating unit (Floating, storage and regasification units - FSRU) for reception, storage and regasification of LNG	Design capacity for regasification and supply - 5.5 bcm/y; Storage capacity - 153,5 thousands m ³
4	Increasing the natural gas transmission capacity at the Kulata/Sidirocastro interconnection point in the direction from Greece to Bulgaria (2 options)	no	2026	Bulgartransgaz EAD	~ 122,5 million €	own and attracted external funding	~ 48 km new pipeline/looping (DN 700), ~ 53 km new pipeline (DN 500)	Main option for incremental capacity project: - from Greece to Bulgaria: 35.365 GWh/d; -from Bulgaria to North Macedonia: 5.383 GWh/d
		no	2029	Bulgartransgaz EAD	~ 307,2 million €	own and attracted external funding	~ 53 km new pipeline (DN 500); ~ 132 km looping (DN 700); replacement of ~ 50 km pipeline DN 700; new 9MW GTCA in CS Petrich	Extended option for incremental capacity project: - from Greece to Bulgaria: 104,4 GWh/d;
4	Increasing the natural gas transmission capacity at the Negru Voda/Kardam interconnection point in the direction from Bulgaria to Romania	no	2026	Bulgartransgaz EAD	~ 191,4 million € ²	own and attracted external funding	~ 61 km new pipeline/looping (DN 1200), reversal of CS Kardam and upgrade of its management system capacity	Incremental capacity from Bulgaria to Romania: 137.15 GWh/d
5	Delivery high-pressure gas transmission infrastructure for supplying consumers in the Maritsa-East region	no	2026	Bulgartransgaz EAD	~ 107,9 million €	own and attracted external funding	~ 73 km new pipeline DN 700 and DN 500, Adjacent technological facilities	High pressure gas infrastructure – pipeline and adjacent equipment

Notes:

¹ Bulgartransgaz EAD participates with 20% of the share capital of the project company. The value includes acquisition of a shareholding in the amount of 20% of the capital of the project company Gastrade, 20% of the costs incurred for project development until making FID and additional investment costs. Up-to-date information about the project is available on Gastrade S.A. website.

² The extended option of the project upgrades the main option and the estimated investment of €307.2 million includes the expected costs of the main option estimated at €122.5 million.

GAS INFRASTRUCTURE OF THE REPUBLIC OF BULGARIA



LEGEND

GAS TRANSMISSION NETWORK

- Gas transmission network of Bulgartransgaz
- Gas pipeline branch
- National gas transmission network branches of third parties
- Gas gathering system
- Planned gas pipelines
- Gas transmission networks of other operators
- Gas transmission networks of other operators - planned
- IBS Interconnection Bulgaria - Serbia
- IGB Interconnection Greece - Bulgaria
- Region
- CS - Compressor station
- Gas storage facility
- Gas storage facility - planned
- Valve group
- AGRS/ GRS/ GMS: Automatic gas regulation station/ Gas regulation station/ Gas metering station
- Pigging Facilities
- Interconnection point
- Interconnection point - third parties
- Liquefied natural gas terminal
- Interconnection point - planned
- Liquefied natural gas terminal - planned