

2023 - 2032 TEN-YEAR NETWORK DEVELOPMENT PLAN OF BULGARTRANGAZ EAD

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Bulgartransgaz EAD Management Board meeting**



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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

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, 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

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

BRUA – Gas transmission corridor Bulgaria-Romania-Hungary-Austria

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 2023-2032 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 2023 – 2032 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 analyses 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).



Compressor station Strandzha

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 activities, 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 an owner and operator of the gas transmission network infrastructure and the underground gas storage Chiren (UGS Chiren) connected to it.

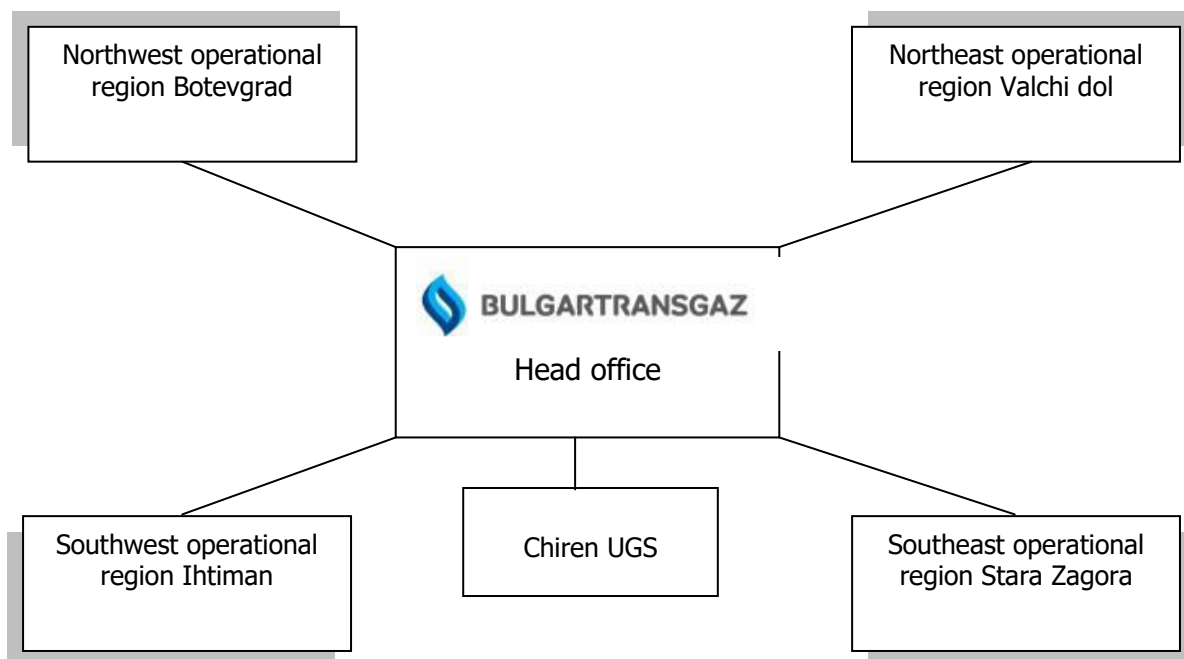
The Company is holder of the following licenses, issued by the Energy and Water Regulatory Commission (EWRC):

- 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 NATURAL GAS STORAGE



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 Turkey, Greece, Serbia, Romania and North Macedonia. It comprises of 3 380 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 389 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/d natural gas. The withdrawal and injection capacity, according to the formation pressures and other factors, is between 5 285 MWh/d up to 40 377 MWh/d (0.5 to 3.82 mcm/d at 10.57 MWh/1000 m³) for withdrawal and 5 285 MWh/d up to 33 824 MWh/d (0.5 to 3.2 mcm/d at 10.57 MWh/1000 m³) for injection. In an emergency situation, the maximum withdrawal capacity is up to 49 679 MWh/d (4.7 mcm/d at 10.57 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 (Turkey), located on the Bulgarian-Turkish border in the area of the village of Strandzha, Bolyarovo Municipality;

Interconnection point (IP) Strandzha/Malkoclar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TAGTAS (Turkey), 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, North 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 system 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 (available after commissioning of IBS project);

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 provides an opportunity for diversification of natural gas supplies both to Bulgaria and to the other countries in the region of Southeast Europe.



13.1.1. Natural gas consumption

Natural gas consumption in Bulgaria in 2022 was 28 203 GWh and marks a drop of 20% compared to the consumption in 2021 (35 430 GWh). The decrease can be considered temporary and is related to the growth of natural gas prices worldwide, the measures taken to limit consumption in the EU under the REPowerEU plan and the consequences of the COVID-19 pandemic.

According to data of NSI Overall Energy Balance for 2021, natural gas had a share of 14.7% in primary energy consumption and 14.4% 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 counties 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

Consumption in the county is provided mostly through import. Local production in the country remains low. In 2022, about 0.3% of natural gas consumption was provided by local production from Galata and Dolni Dabnik fields. The share of natural gas imports in Bulgaria last year was 99.7%.

Bulgartransgaz EAD works actively and consistently to improve interconnectivity by

strengthening and developing the interconnections with neighbouring countries and providing opportunities for supplies from various new 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.

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. Uni-directional transmission capacity is available only at the border with the Republic of North Macedonia through the only entry IP for natural gas supplies Kyustendil/Zhidilovo.

Since 2020, by ensuring significant transmission capacities by Bulgartransgaz EAD and the partners, operators in neighbouring countries, there are significant natural gas quantities from alternative sources and routes to Bulgaria, and through Bulgartransgaz EAD network - to the neighbouring countries as well.

On 01.10.2022, Interconnection Greece-Bulgaria (IGB), implemented by the project company ICGB AD, with design capacity up to 3 bcm/year, was put into commercial operation.

As a result of the availability of sufficient capacity in the operating facilities, a single balancing zone, respectively a Virtual Trading Point, was established, which facilitates the management of the balancing portfolios of network users and traders, and increases the competitiveness and liquidity of natural gas market.

The availability of a single balancing zone and respectively a single VTP enables network users and gas traders to work with a single balancing portfolio, which eliminates the risks of generating positive imbalances in one balancing zone and negative in the other one. As a result of integration of the balancing zones and VTP, the efficiency of portfolio management increased and the entry of new market participants was facilitated, thus fostering increase of liquidity and gas market development in Bulgaria.

In 2021 and 2022, the natural gas quantities by sources of supply were as follows:

No	Type of supply	2021		2022	
		Quantity, GWh	Relative share	Quantity, GWh	Relative share
1	<i>Imported natural gas including</i>	<i>35,206</i>	<i>99.37%</i>	<i>28,132</i>	<i>99.7%</i>
1.1.	<i>Russian Federation</i>	<i>31,115</i>	<i>87.82%</i>	<i>12,903</i>	<i>45.7%</i>
1.2.	<i>Other sources</i>	<i>4,090</i>	<i>11.54%</i>	<i>15,229</i>	<i>54.0%</i>
2	<i>Local Production</i>	<i>224</i>	<i>0.63%</i>	<i>71</i>	<i>0.3%</i>
	TOTAL	35,430	100.00%	28,203	100.0%

Gas quantities from alternative sources for consumption in Bulgaria marked a significant increase in 2022 compared to 2021.

Due to the reduced flows of Russian gas to Europe, significant amounts of pipeline gas and LNG were directed to European countries from alternative sources such as Norway, Algeria, USA, Qatar, Nigeria, etc. LNG terminals will continue to play a key role in enhancing European gas security.

The REPowerEU plan for affordable, secure and sustainable energy, announced by the European Commission on 8 March 2022, envisages a significant increase in LNG supplies to EU countries to end dependence on supplies of energy sources from Russia and accelerate the transition to clean energy.

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

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 – gas operator licensed to perform natural gas transmission activities;
- 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 transactions 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 the 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 2021 on the territory of the Republic of Bulgaria 24 licensed gas distribution companies operate in 35 licensed territories, covering 173 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, programs are being implemented to promote household gasification and the development of natural gas distribution infrastructure continues.

The total number of customers of the gas distribution companies as of 31.12.2022 is 152 383, of which 8 253 non-household and 144 130 household customers. The number of customers has grown by 4.2% in one year - from 146 243 in 2021 to 152 383 in 2022. Household customers have increased by 4.4% and non-household - by 1.2%.

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 2023, 69 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 № 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 operation in the last three years, gas liquidity in the country significantly increased, the practices of exchange trading have been introduced and increasing role and share of the spot market (within the day and day-ahead). According to data for 2022, the traded natural gas quantities amount to 22,577,302 MWh. The total number of transactions for the year was 7,698, showing an increase of 67% in the short-term segment (spot) and 20% in the long-term segment compared to 2021.

An important factor for the increased liquidity is the number and activity of BGH members. Most of them are leading Bulgarian companies in the field of natural gas trade. About 40% of the members on 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 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).

Bulgartransgaz EAD and Balkan Gas Hub EAD are parties 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.

Within the framework of the initiative, exchange operators and operators of gas transmission networks from Greece, Romania, Austria, Poland, Hungary, Moldova and Ukraine participate as well. 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. SEEGAS is fully supported by the European Bank for Reconstruction and Development (EBRD), whereas 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 international standards and best practices.

BGH is an internationally recognized and legitimate gas exchange in the country, acknowledged by international institutions and organizations, as well as by international market participants. Thanks to the continuous improvement of interconnectivity, carried out by Bulgartransgaz EAD, the effect of achieving SEEGAS objectives 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 №715/2009.

Natural gas transport

The company has concluded access and transport contracts with over 80 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 2021 and 2022 is presented in the following table:

No	Type	Quantity 2021 (MWh)	Relative share	Quantity 2022 (MWh)	Relative share
1	Transport to exit points in the country	35,430,139	25.82%	28,202,548	17.24%
2	Transport to cross-border points with neighbouring countries	101,778,323	74.18%	135,390,955	82.76%
Total:		137,208,462	100.00%	163,593,503	100.00%

There is a significant increase compared to 2021 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 key role in compensation of seasonal fluctuations in natural gas consumption and providing an emergency reserve in case of unforeseen and force majeure situations.

In 2022, the total injected natural gas quantities in Chiren UGS were 4,564 GWh, and the withdrawn quantities 2,555 GWh. The decrease in the withdrawn natural gas quantities can be characterized as temporary and is due, on one hand, to the mild winter and on the other hand, on the high gas prices during the injection period.

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 Bulgartrangaz EAD at entry point GMS Galata.

Production was also performed by the company Exploration and Production of Oil and Gas Plc at entry point GMS Dolni Dabnik.

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 given the ongoing search and exploration activities, including in the Black Sea.

1.2. Market potential and development prospects

Bulgaria has strategic geographic location, well-developed gas infrastructure and by implementation of the already completed and planned new projects, the country has the potential to become an important factor in ensuring energy security and diversification of natural gas sources and supply routes to Bulgaria and the countries of the region.

Natural gas is at the heart of the policy of the European Union to cut greenhouse emissions by 2030. Gas infrastructure will play a key role as well for the decarbonisation and achieving carbon neutrality by 2050. EU policy is aimed at phasing-out coal use and gradual increase in the use of alternative environmentally friendly energy sources such as hydrogen.

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 household gas supply in Bulgaria remains low 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 presuppose an increase in the use of natural gas in the household sector.

By implementation of the projects for new gas infrastructure in the country and the region, 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.

The project of Chiren UGS expansion aims to increase the active gas volume up to 1 bcm and increase in the daily withdrawal and injection 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. In this way, the project will contribute to enhancing the liquidity of gas markets in Bulgaria and the region.

The Interconnector Bulgaria-Serbia of 1.8 bcm/year capacity and possibility of reverse flow will enable the diversification of natural gas supplies to the region by providing new sources and routes of natural gas supply. Bulgaria will get access to gas sources from Western Europe along a completely new route and Serbia, to LNG terminals and other alternative sources in the region.

Bulgartransgaz EAD participates with 20% of the share capital of Gastrade S.A. - the project company that implements "Alexandroupolis Independent Natural Gas System" of 5.5 bcm/year natural gas regasification capacity. Bulgaria's participation in the project is strategically important for diversification and security of energy supply to Bulgaria and other countries in the region.

The Solidarity Ring (STRING) joint initiative of gas transmission operators Bulgartransgaz EAD, Transgaz S.A. will also contribute to improving security, diversifying supply sources and routes, and increasing market liquidity.

The importance of the initiative was confirmed on 25.04.2023 in Sofia with the signing of a Memorandum to promote cooperation between gas transmission operators and SOCAR by the Ministers of Energy of Bulgaria, Romania and Azerbaijan, the Minister of Foreign Affairs and Trade of Hungary and the Minister of Economy of Slovakia.

The purpose of the Solidarity Ring is to provide an alternative gas corridor for supplies of additional quantities of natural gas from Azerbaijan, through the gas transmission networks of Bulgaria, Romania, Hungary and Slovakia. The initiative is open to the joining of other participants in view of the aspiration of the countries of the region to diversify supplies and

the availability of opportunities to secure additional quantities of gas, including LNG from alternative sources.

The initiative is supported by the European Commission and is key to increasing the security of natural gas supplies for the European Union, as well as for the region of Central, Eastern and Southern Europe.

Based on the Memorandum of Understanding on Strategic Partnership in the Energy Sector, concluded between the European Commission and Azerbaijan on 18.07.2022, natural gas supplies to the European markets are expected to increase significantly, reaching 20 bcm/year by 2027.

Initially, the Solidarity Ring route will be able to transport up to 5 billion m³ of natural gas per year through the existing networks. In the presence of commercial interest and implementation of the relevant projects to increase the technical transmission capacity of each operator, the possibility of natural gas supplies from alternative sources will be ensured.

The Company also plans projects related to assessment of the opportunities and subsequent retrofitting of the existing infrastructure to ensure its adaptation for mixing natural gas with hydrogen and to construct fully hydrogen infrastructure from Sofia region to the Bulgarian-Greek border at IP Kulata/Sidirokastro. Bulgartransgaz EAD is developing a project for construction of new gas transmission infrastructure in the region of Maritsa East Coal Basin, intended for transport of hydrogen, low-carbon gaseous fuels and their natural gas mixtures. 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

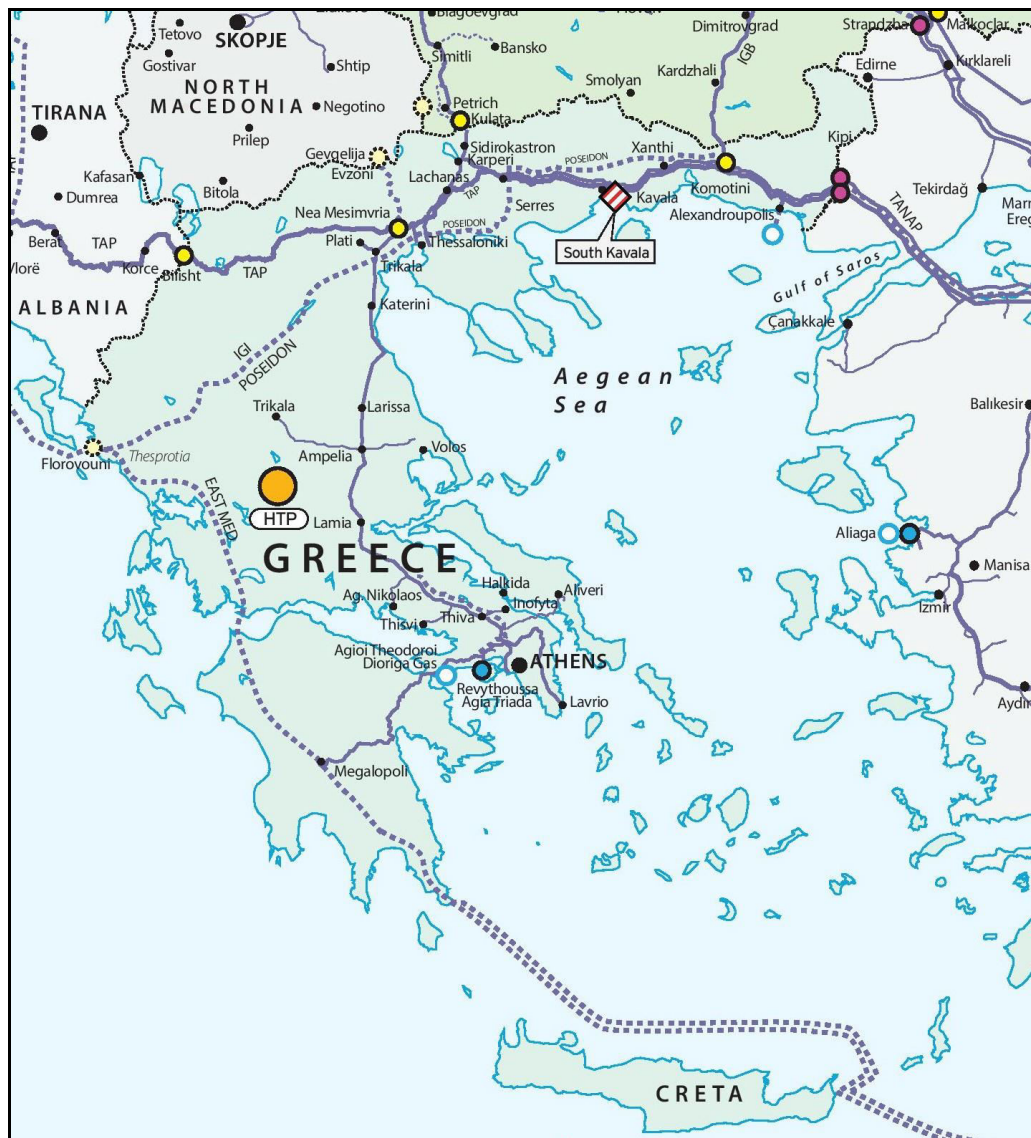
By implementation of large-scale projects in the region for development of gas transmission infrastructure, increase of gas storage capacities and new LNG terminals, as well as the potential of local production, natural gas consumption is expected to increase in the conditions of high levels of competition 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 2022, natural gas consumption in Greece amounted to 5.2 bcm, representing a decrease of approximately 19% on an annual basis compared to 2021 (6.45 bcm). Electricity generation accounts for a significant share of annual gas consumption. Consumption in the country is provided mainly by imports through Bulgaria, Turkey, the Trans-Adriatic gas pipeline and from liquefied natural gas sources.

The Greek gas transmission operator DESFA S.A. develops projects for gradual increase of the technical capacity for transmission of the national gas transmission system of Greece, through modernization of the existing ones and construction of new compressor stations. The investments planned will enable increase of the capacity from Greece to Bulgaria at IP Kulata/Sidirokastro up to 9.5 mcm/day. Their implementation will provide additional quantities from alternative natural gas sources for the region.

The construction of new interconnectors with neighbouring countries and LNG terminals is

among the priorities, 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 Revithoussa. From the beginning of 2024, the terminal in Alexandroupolis is also planned to be put into operation. It is expected that by 2024 there will be five LNG terminals in the country, with a total regasification capacity of up to 25.7 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	Q1 2024	Floating	Gastrade	5.5
Dioriga Gas FSRU	Q4 2024	Floating	Dioriga Gas	2.5
Thrace LNG	Q4 2024	Floating	Gastrade	5.5
Argo FSRU	Q4 2024	Above-ground	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. There is a possibility to increase the transmission capacity up to 5 bcm/year, by building a compressor station on the territory of Greece.

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, with the possibility of doubling. 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. The commercial operation of the gas pipeline began in November 2020.

EastMed

The project envisages construction of a gas pipeline of 2000 km total length for natural gas transportation from the fields in the Eastern Mediterranean to Europe. The design capacity is 11 bcm/y, with possibility to reach 20 bcm/y. The EastMed gas pipeline is a project of "common interest" included in the Fifth list of the EC and has the prospect of becoming an alternative energy corridor to Europe, providing access to the fields in the Levantine Basin.

Poseidon

The project envisages construction of a 210 km offshore pipeline through Greece to Italy. Poseidon is planned to be connected to EastMed gas pipeline in Thesproti. The initially envisaged capacity is 12 bcm/y with possibility to increase up to 20 bcm/y. The implementation of this project will provide Italy and the European countries with the opportunity of natural gas supply from the Caspian Sea or the Middle East. The project is also included in the Fifth list of projects of common interest (PCI) of the EC. Gas pipeline

construction is expected to commence in 2025 and be completed in 2028.

Revithoussa LNG Terminal

Revithoussa liquefied natural gas terminal has annual capacity of up to 7 bcm and 225 000 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.

In 2019, the first deliveries were made to the Bulgarian liquefied natural gas market through the terminal, 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. The storage capacity is 153.500 thousand m³. Potential supply sources include large LNG producers such as the USA, Algeria and Qatar.

In August 2020, Bulgartransgaz EAD signed the final Agreement for purchase and sale of 20% of Gastrade S.A. capital - project company for terminal implementation. On 28.01.2021, after permission from the Commission for Protection of Competition of the Republic of Bulgaria, the process of shares acquisition by Bulgartransgaz EAD in the project company was finalized.

In January 2022, a final investment decision was made for project construction. The terminal is expected to be put into commercial operation until 01.01.2024.

The project will be in synergy with expansion of Chiren underground gas storage. Terminal construction will also contribute to implementation of the overall Balkan Gas Hub concept, which envisages to connect the natural gas markets of the countries in Central and East Europe by construction and development of the necessary gas transmission infrastructure.

Currently, Greece does not have its own underground gas storage.

2.2 Turkey



Gas transmission infrastructure in Turkey. Source: ENTSG

In 2022 natural gas consumption in Turkey amounted to approximately 52 bcm, which is a decrease by about 15% on an annual basis compared to 2021 (59.6 bcm). During the winter period, peak consumption reached levels of 250-300 mcm/day, with demand expected to increase in the future due to the growth of economy in the country.

A large share of natural gas in Turkey is used to generate electricity. Demand is expected to increase in the future, as Turkey plans 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.

Turkey produces small quantities of natural gas, about 300-400 mcm, covering an insignificant part of domestic consumption. In addition, at the end of 2022, the discovery of 58 bcm was announced in Caycuma-1 well in the northwestern part of Sakarya gas field in the Black Sea. Thus, the discoveries of gas fields in the Turkish Black Sea aquatory reach 710 bcm.

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.

Turkey 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. At the end of 2022, a third floating terminal (Saros FSRU), operated by BOTAS S.A., was run into operation.

LNG infrastructure in Turkey:

Facility	Year of commissioning	Type	Operator	Regasification capacity (bcm/year)
Marmara Ereglisi LNG Terminal	1994	Above-ground	BOTAS	12.80
Aliaga Izmir 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 Turkey for 2021 was 24% of the total import in the amount of 14.1 bcm. The main sources of LNG supplies for the country are Algeria, USA, Nigeria, Egypt, etc.

In December 2022, the expansion of the storage capacity of Silivri gas field up to 4.6 bcm and daily capacity of 75 mcm was completed.

In January 2023, an agreement was concluded between the Turkish energy company Botas and the public supplier of the Republic of Bulgaria, providing access to the regasification terminals of liquefied natural gas in Turkey and its subsequent transport to the territory of Bulgaria. The agreement has a duration of 13 years and provides an opportunity for transportation of up to 1.5 bcm/y gas between the gas transmission systems of both countries.

2.3 Romania



Gas Transmission Infrastructure in Romania Source: ENTSG

In 2022, natural gas consumption in Romania amounted to 10.2 bcm, which is a decrease by about 16% on an annual basis compared to 2021 (11.7 bcm). The country has significant domestic production, sufficient to cover about 70% of the country's consumption. Romania has six gas storage facilities of 3.1 bcm total capacity. During the winter period, peak consumption reached levels of 65 mcm/day.

The necessary additional quantities to cover demand in the country were provided by imports, also through the interconnection points with Bulgaria.

Romania is characterised by a well-developed gas transmission infrastructure and interconnectivity with Ukraine, Bulgaria, Hungary and Moldova, and high degree of development of the distribution networks.

The Programme for gas infrastructure development in Romania is bound to a large extent to the development of the Black Sea fields.

Interconnection Romania-Serbia

Project for 97 km gas pipeline construction, 85 km of which on the territory of Romania and 12 km on the territory of Serbia. Currently, Romania has interconnection points with all neighbouring countries, except for Serbia. The interconnector will ensure 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 2022, it amounted to 0.28 bcm, which is a drop of over 33% on an annual basis compared to 2021 (0.42 bcm).

The high-pressure gas infrastructure supplies mostly the area of the city of Skopje. The natural gas market is developing. At present, natural gas is used mainly in the industrial sector and by local district 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). At the end of 2022, the government of the Republic of North Macedonia granted the status of a strategic investment project to the newly built co-generation plant in Skopje.

In this regard, the Republic of North Macedonia and Albania concluded a Memorandum of

Understanding in the field of energy, providing for strengthening of the cooperation in planning of new gas infrastructure, renewable energy and construction of a new LNG terminal in Vlorë.

At the end of 2022, Bulgartransgaz EAD and GA-MA AD (transformed into NOMAGAS AD) concluded an Interconnection Agreement for IP Kyustendil/Zhidilovo. The agreement increases the technical capacity for gas transmission to North Macedonia by 500 thousand m³/d or an increase of 182 mcm/year. 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. After signing of the agreement, North Macedonia was given the opportunity to diversify its supply through access to alternative sources of gas, including LNG.

Greece-North Macedonia Interconnection project 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 gas pipeline capacity is planned to be 1.5 bcm/y.

A project 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.

2.5. Serbia



Gas transmission infrastructure in Serbia Source: ENTSOG

Natural gas consumption in Serbia in 2022 remained approximately 3 bcm. Natural gas production in Serbia is carried out in the region of Vojvodina by the company Naftna Industrija Srbije. Local production satisfies about 12% of demand, while the remaining natural gas quantities are mainly provided by imports from the Russian Federation based on long-term contracts.

In June 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 two Hungarian gas storage facilities.

Most of the natural gas quantities to Serbia are imported from the Russian Federation via Bulgaria.

A significant project is the implementation of the planned Interconnection Bulgaria-Serbia (IBS), announced by the EC as a PCI included in the Fifth PCI list. The gas pipeline will have 1.8 bcm/y capacity with capability of reverse flow. The interconnector is planned to be run into operation by October 2023. The construction of reverse gas Interconnection Bulgaria – Serbia will enable diversification of natural gas supplies to the region by ensuring new natural gas supply sources and routes. Bulgaria will get access to gas sources from Western Europe along a completely new route and Serbia, to LNG terminals and other alternative sources in the region.

2.6 Current status, market potential and development prospects

EU accounts for approximately 12.1% of the world natural gas consumption, but at the same time the EU has only 0.6% of the global reserves. This makes the EU largely dependent on natural gas imports.

In 2022, imports of pipeline gas from Russia to the EU drop significantly by more than 70 bcm per year compared to 2021. Reduced volumes are being compensated by increased imports of LNG and pipeline gas from alternative sources.

At EU level, there has been an increase in LNG imports to the EU from the USA, Qatar, Algeria, Nigeria, and Trinidad and Tobago. Currently, there is a high LNG demand on the Asian markets, but prospects are for a significant increase in the European gas markets as well. According to a European Commission report, in the first three quarters of 2022, EU countries imported 97.9 bcm of LNG, which on annual basis represents a 40% increase compared to 2021 (58.3 bcm). Quantities were provided mainly from the US, accounting for 45% of total LNG imports.

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.

In the last years, Bulgartransgaz EAD has made significant investments in rehabilitation, modernization and capacity increase of the existing gas infrastructure. The country is actively working to increase the energy security by accelerating the process of diversifying natural gas sources and routes.

Bulgartransgaz EAD has the necessary infrastructure capable to meet the demand in the country on different routes independent from one another. The company has a successful cooperation with TSOs from the countries in the region. This is evidenced by the implementation of joint projects that contribute to the diversification of natural gas sources and increase the energy security.

Significant supply has been realized from various sources, such as Azerbaijan, USA and others, including LNG supply from the terminal in Revithoussa, Greece. The construction of the Alexandroupolis LNG terminal and other planned terminals in the region will further contribute to increasing the security of supply, diversification and competition for the benefit of end-users by providing a choice of pricing conditions.

Development of the interconnectivity between Bulgarian and the countries from the region

has a significant importance to achieving a market integration. There are objective expectations for growth in the natural gas consumption.

Bulgartransgaz's projects for capacity increase of Chiren UGS, technical capacity increase at the interconnection points and development of the Bulgarian gas transmission infrastructure 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 construction of the Liquefied Natural Gas Terminal Alexandroupolis where Bulgartransgaz EAD participates with 20% of the share capital of the project company is strategically important for the diversification and security of energy supply for Bulgaria and other countries in the region.

The company envisages to implement Chiren UGS expansion project by 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 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.

The Solidarity Ring (STRING) initiative, proposed by Bulgartransgaz EAD together with Transgaz S.A. (Romania), FGSZ Ltd. (Hungary) и Eustream a.s. (Slovakia), provides a secure alternative route for gas supplies in sufficiently large volumes through the operators' existing networks. In the short term, and with minimal improvements to the existing infrastructure, the project could transport up to 5 bcm of natural gas per year from Turkey and Greece to Eastern, Central and Western Europe via Bulgaria, Romania, Hungary and Slovakia, and could increase to 20 bcm per year in the future. This will enable European consumers to receive more natural gas from the Southern Gas Corridor pipelines. The initiative is in line with the REPowerEU plan and with the Memorandum of Understanding on Strategic Energy Partnership signed by the President of the European Commission, Ursula von der Leyen and President of Azerbaijan Ilham Aliyev on 18 July 2022. In this regard on 25.04.23, a Memorandum of Understanding was signed in Sofia between the relevant ministers of Bulgaria, Romania, Hungary, Slovakia and Azerbaijan to promote cooperation between the gas transmission operators under the initiative and the State Oil Company of Azerbaijan - SOCAR.

Bulgartransgaz EAD is planning new 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. These projects are proposed for inclusion in the special REPowerEU chapter of the National Recovery and Resilience Plan. They are planned to be commissioned in 2025-2026, creating conditions for increasing the diversification in the region and ensuring 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 imports 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 will be created for diversification and a consequent reduction of the energy dependence, which will also lead to an increase in the volumes of gas 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.

According to European Network of Transmission System Operators for Gas (ENTSOG) data, 167 hydrogen energy projects have been submitted for inclusion in ENTSOG's 2022 Ten Year Network Development Plan. The projects cover hydrogen production, construction of an all-hydrogen infrastructure, and repurposing of transmission infrastructure and fueling facilities

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.

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.

In October 2022, the EC launched a call for projects of common interest (PCI), within the meaning of Regulation (EU) 2022/869 of 30 May 2022. The focus is on the decarbonisation and achieving the Union's 2030 and 2050 targets, with hydrogen infrastructure and smart grids identified as priorities. Bulgartransgaz EAD's hydrogen-focused projects are proposed for inclusion in the list of projects of common interest expected to be published by November 2023.

NATURAL GAS TRANSPORT AND STORAGE



Chiren UGS

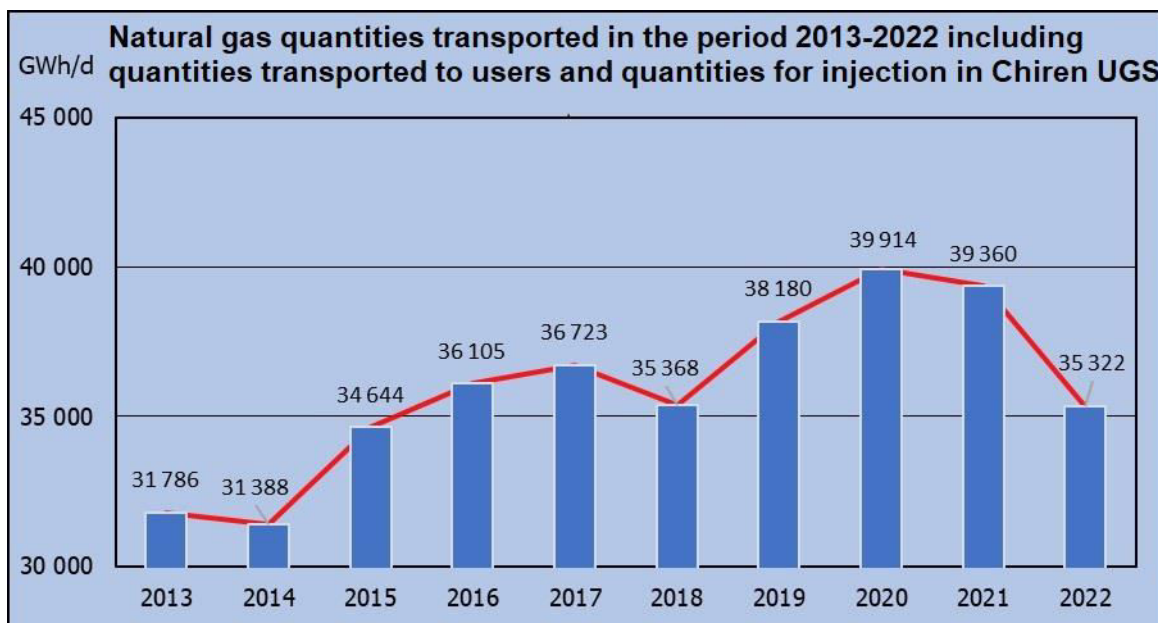
1. NATURAL GAS TRANSPORT

As a licensed gas transmission operator Bulgartransgaz EAD ensures:

- 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 2022 is 35,322 GWh and has decreased by 10% 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 (35,322 GWh) and respectively the actually transported natural gas quantities (28,203 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.

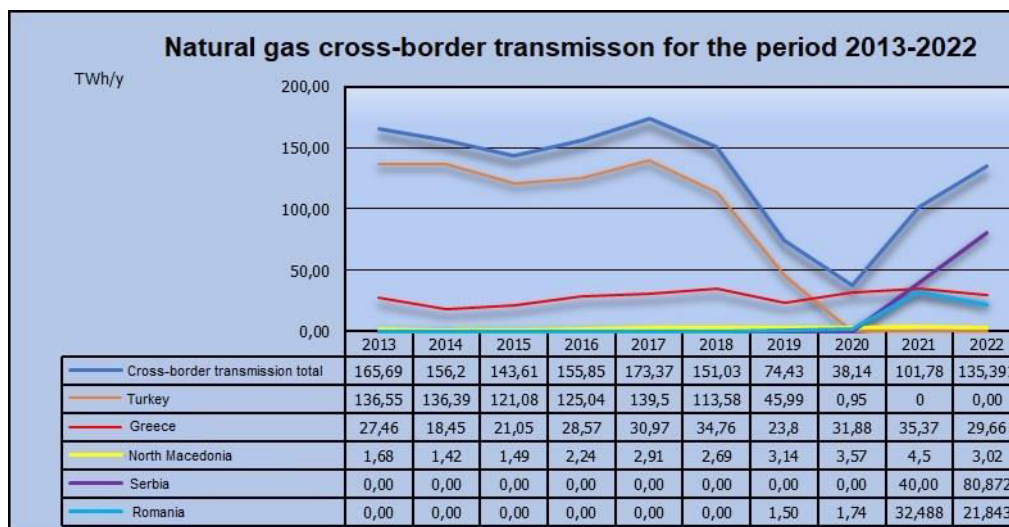
2. CROSS-BORDER NATURAL GAS TRANSPORT

Physical quantities of natural gas transported across borders in 2022 are 135,391 TWh or over 30% more than in 2021 (101,778 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.

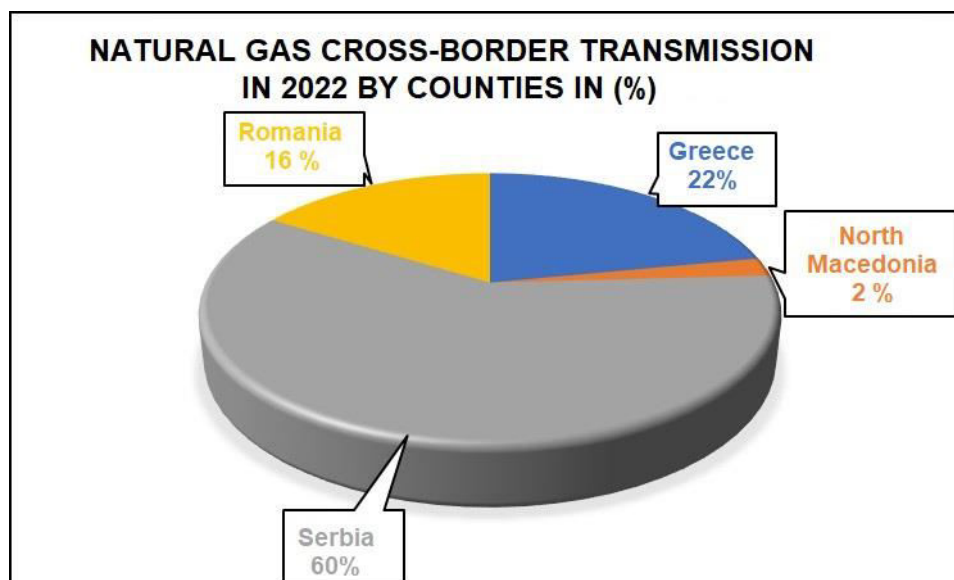
It is expected that in the coming years, with the implementation of the new interconnection projects, increased technical transmission capacity and other priority projects in the region, natural gas volumes transported to increase and exceed the 2021 and 2022 levels.

Growth in cross-border transmission is also expected as a result of EU demand for supplies from alternative sources of pipeline gas and LNG, as well as the European Commission's agreement with Azerbaijan on additional volumes.

Cross-border transmission through the territory of Bulgaria for the period 2013-2022 is shown in the diagram below:



The percentage distribution of cross-border transmission in 2022 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.

In the long run, prospects are 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 this regard, the implementation of the project for expansion of the capacity of the existing gas storage facility in Chiren was launched.

The Chiren UGS expansion project is a first step of the gas storage capacity expansion concept in the region, set as a PCI of the EU. The active gas volume in the storage facility is envisaged to increase from 5,814 GWh to 10,570 GWh and the daily withdrawal and injection capacities shall increase up to 85-106.4 GWh/d.

In 2021, 3,930 GWh of natural gas were injected and 4,961 GWh were withdrawn, and in 2022, 4,564 GWh of natural gas were injected and 2,555 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 2021 and 2022								
Month	Withdrawal				Injection			
	2021		2022		2021		2022	
	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters
January	1,234.603	116,936	1,096.342	103,968	0	0	0	0
February	1,008.092	95,499	521.792	49,436	0	0	0	0
March	885.848	83,919	201.793	19,082	0	0	0	0
April	115.904	11,026	50.075	4,729	0	0	108.626	10,257
May	0.000	0	0.000	0	663.679	63,057	256.273	24,177
June	139.832	13,311	0.000	0	644.012	61,305	745.091	70,027
July	0.000	0	0.000	0	755.545	71,684	744.518	69,277
August	0.000	0	0.000	0	821.713	77,740	830.918	76,962
September	0.000	0	0.000	0	743.672	70,390	798.588	74,739
October	32.565	3,093	0.000	0	301.278	28,611	867.894	81,340
November	550.139	52,136	87.436	8,141	0	0	212.173	19,755
December	994.227	94,369	597.795	55,198	0	0	0	0
Total:	4,961	470,289	2,555	240,553	3,930	372,788	4,564	426,535

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.

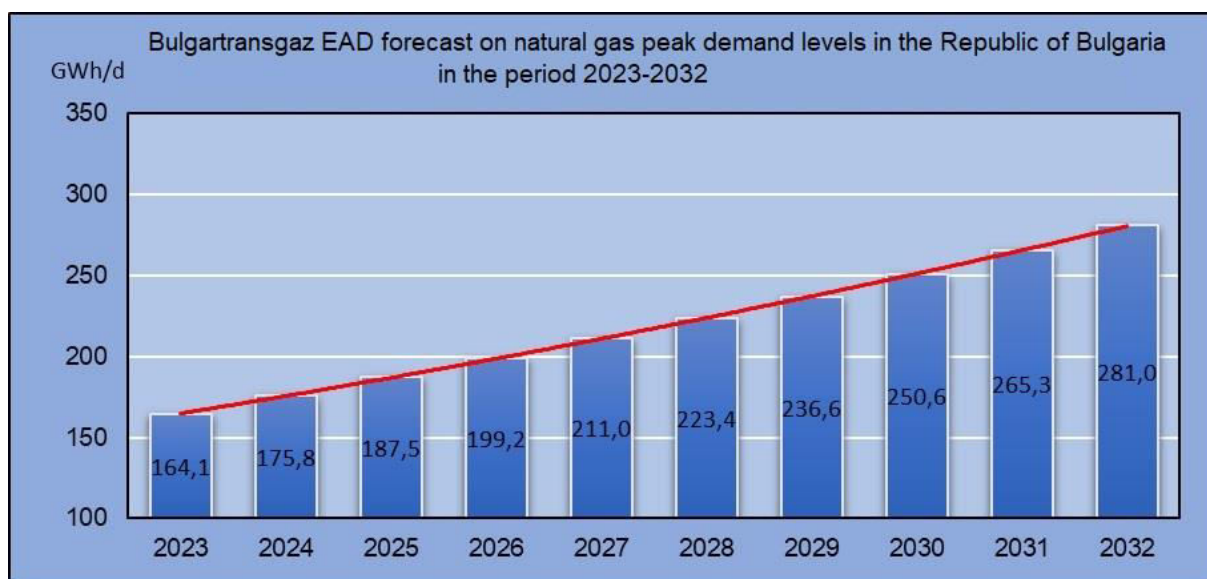
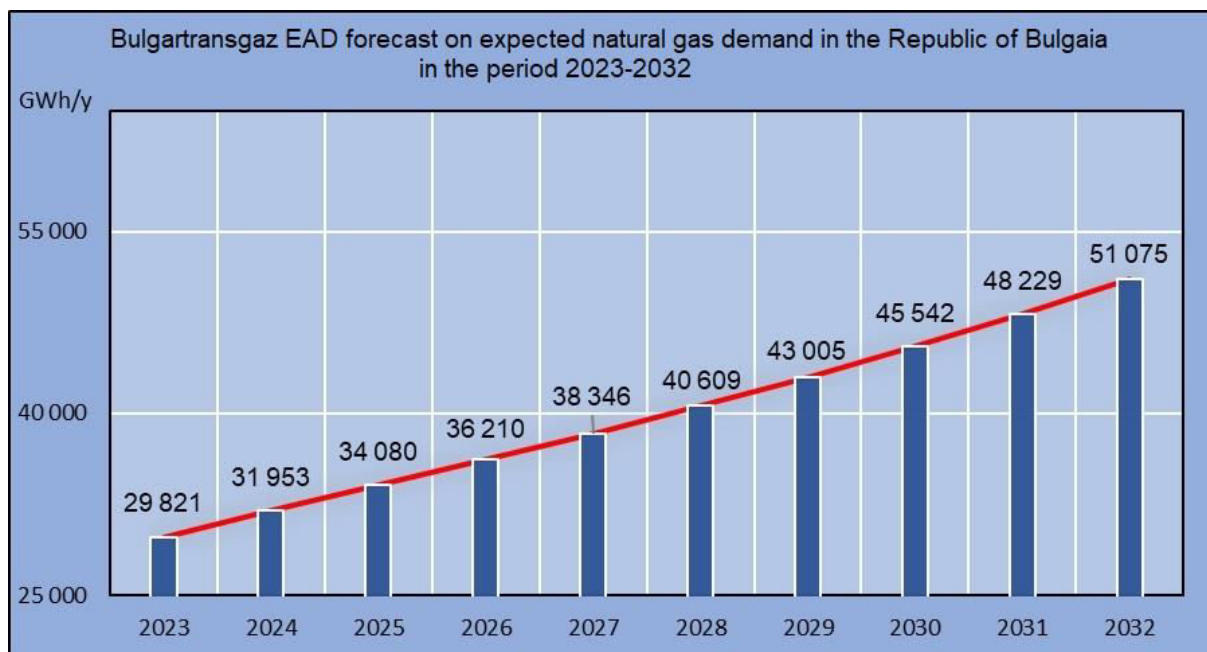
The relationship between the final and primary energy consumption (FEC and PEC) and the GDP growth for past periods have been analysed as well¹.

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:

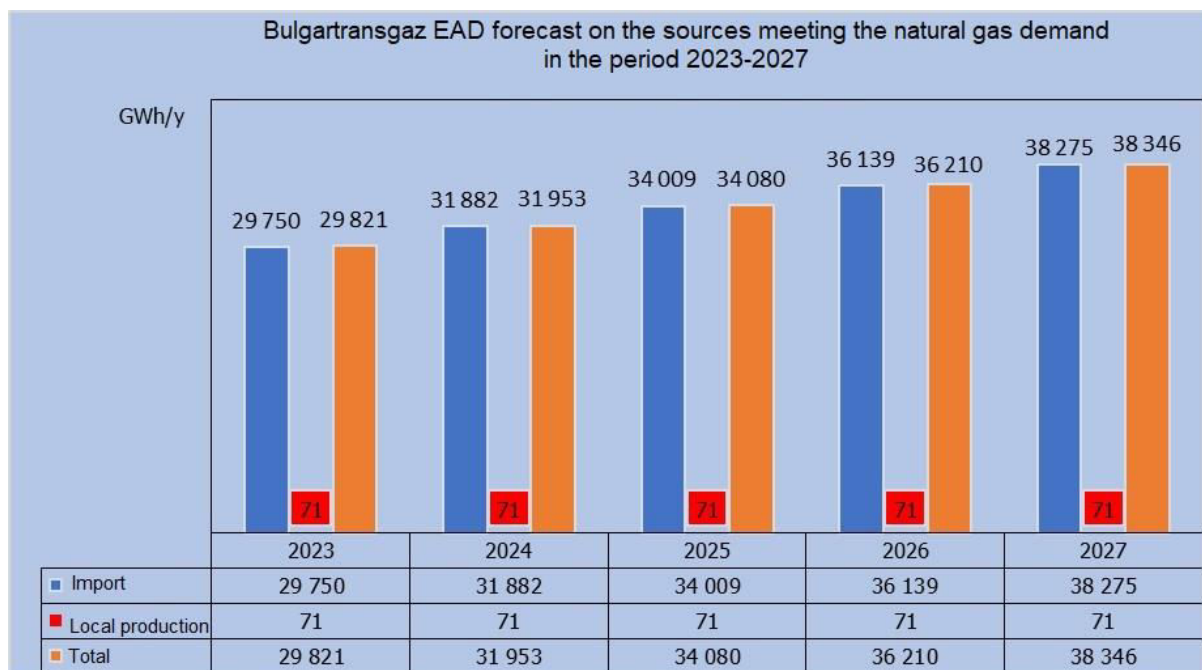


2. SOURCES TO MEET DOMESTIC DEMAND

In 2022, natural gas demand has been satisfied as follows:

- Import - 28,132 GWh (99.7%);
- Local production – 71 GWh (0.3%).

The forecast on the sources meeting the natural gas demand in the country for the period 2023-2027 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 Turkey, 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

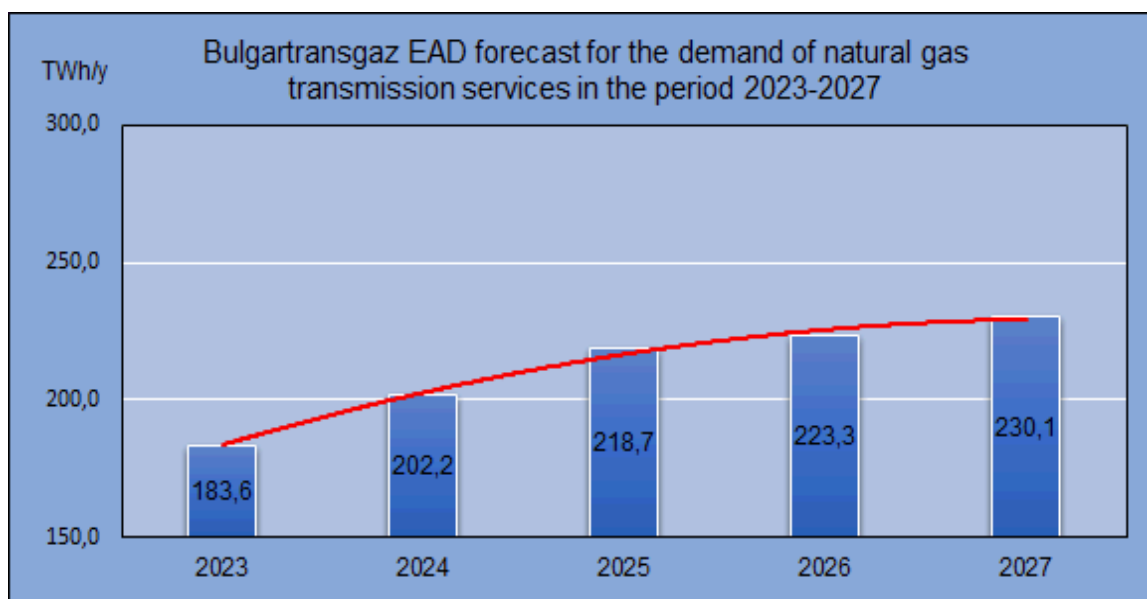
In 2023, local production is expected to remain insignificant. Considering the permits issued for oil and gas exploration, domestic production can be expected to increase in the coming years in the event of new gas discoveries offshore the Black Sea.

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:

- the realisation of the Balkan Gas Hub concept;
- the development and establishment of a liquid regional gas market;
- the Chiren UGS capacity expansion;
- the accelerated diversification of natural gas sources in the region of South Eastern Europe;
- the commissioning of the planned new interconnections;
- 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;
- the growth in natural gas consumption in the country.

Forecast for the transported natural gas quantities to exit points of the gas transmission system, including interconnection points is shown in the following chart:





GMS Strandzha

The calculation of the N-1 standard has been prepared for the period 2023-2027 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 capability of the technical capacity of the gas infrastructure to satisfy the total gas demand in the area under calculation 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:

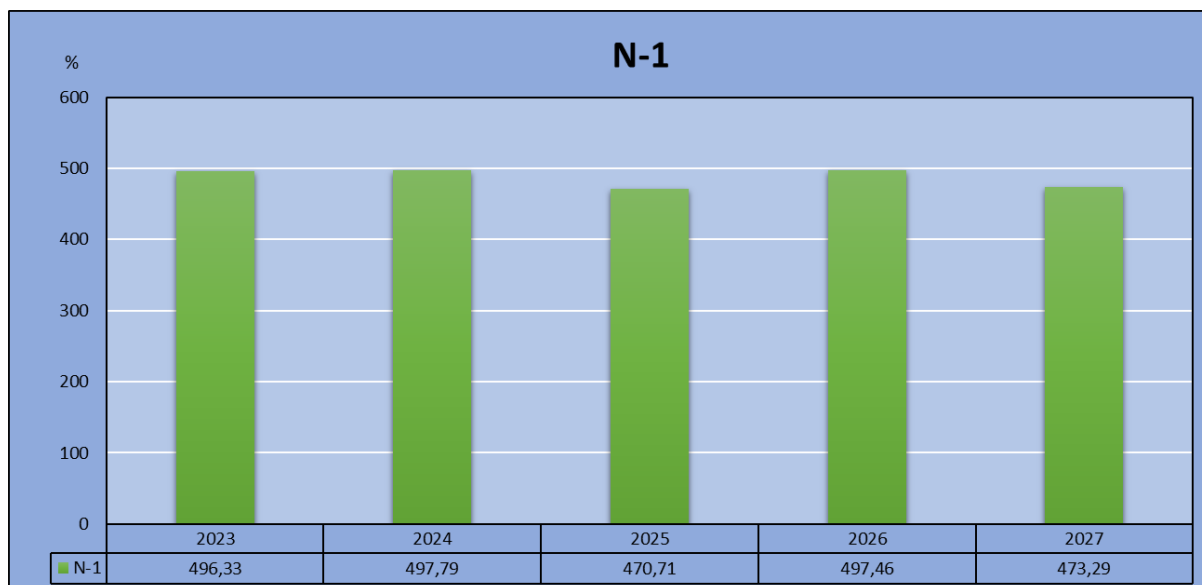
$$N - 1 [\%] = \frac{EP_m + P_m + S_m + LNG_m - I_m}{D_{max}} \times 100$$

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 the Interconnection Greece-Bulgaria (IGB), mcm/d
EP₇	Technical capacity of IP Kireevo/Zaycar, mcm/d
LNG_m	LNG maximum technical capacity
S_{max}	Withdrawal from Chiren UGS – the maximum possible
P_{max}	Domestic gas production – the maximal possible production
D_{max}	National consumption – peak consumption
I_{max}=EP₁	The single largest gas infrastructure - IP Strandzha 2/Malkoclar, mcm/d

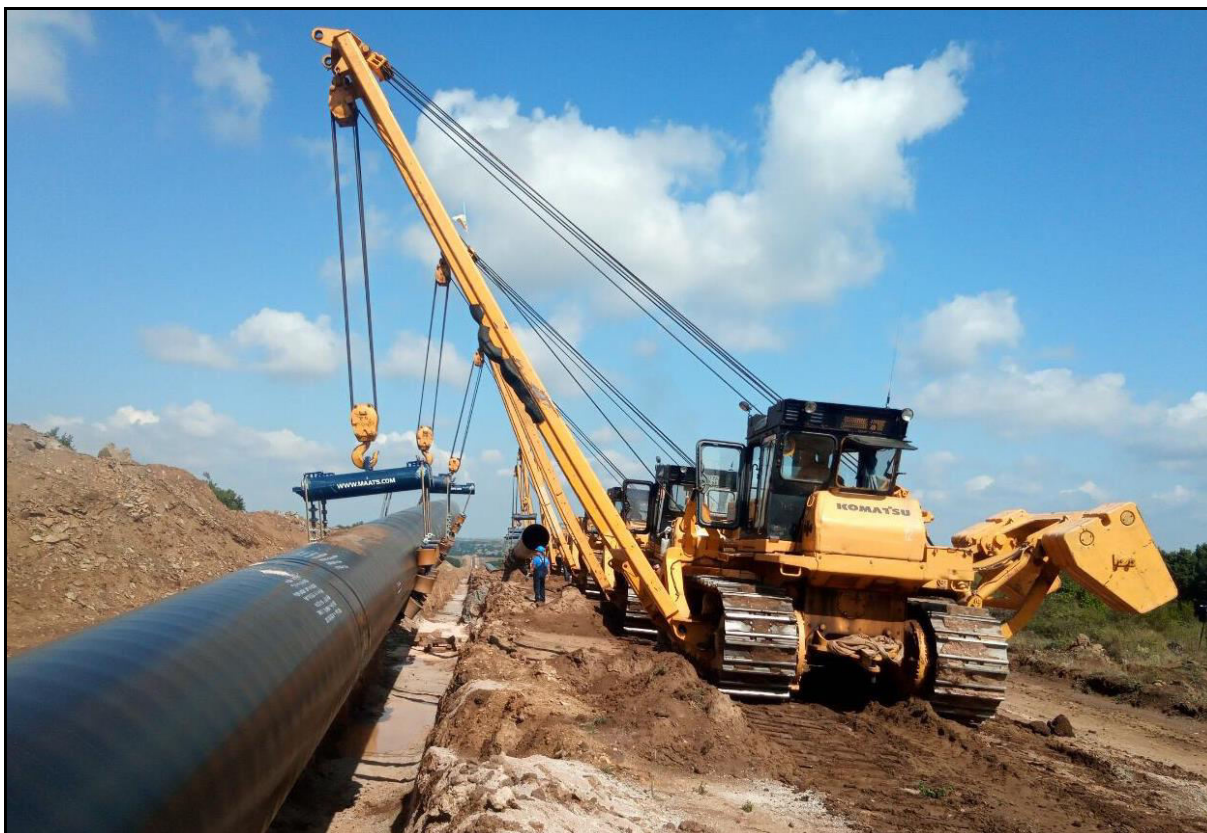
The results of the N-1 formula for the next five years are as follows (capacity data in the formula N-1 are expressed in mcm/d in line with the Regulation):

Година	P _{max}	S _{max}	EP ₂	EP ₃	EP ₄	EP ₅	EP ₆	EP ₇	D _{max}	LNG _{max}	Ep1=I _{max}	N-1
mcm/d												
2023	0,03	4,70	20,27		6,12	4,11	9,13	32,00	15,38	0,00	54,60	496,33
2024	0,03	5,40	20,27	5,00	6,12	4,11	9,13	32,00	16,48	0,00	54,60	497,79
2025	0,03	6,10	20,27	5,00	6,12	4,11	9,13	32,00	17,58	0,00	54,60	470,71
2026	0,03	6,80	20,27	5,00	9,50	4,11	15,22	32,00	18,68	0,00	54,60	497,46
2027	0,03	7,50	20,27	5,00	9,50	4,11	15,22	32,00	19,78	0,00	54,60	473,29



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 Bulgartrngaz 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 has alternative natural gas supply routes, enabling the satisfaction to a full extent of the domestic natural gas demand independently from one another.



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 2023-2032.

The investments provided for the period 2023-2032 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 municipalities and new end users to natural gas, thereby contributing to an enhanced environmental protection, quality of life, energy efficiency and savings from cheaper fuel by means of:

- Expansion of the existing gas transmission networks to new regions in the country;
- Construction of new gas metering and gas regulation stations, providing an opportunity for connection of new end users to the gas transmission networks or gas distribution networks.

This chapter of the TYNDP constitutes structured information about the basic infrastructure planned for construction, expansion, reconstruction and modernization during the next ten years (2023-2032).

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 2023 - 2025 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 2023-2032 – Table 2;
- Projects for the development of the gas transmission and storage infrastructure in the period 2023-2032 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 2023-2025 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 2023 - 2025, are presented in consolidated form in Table 1. The implementation of some of the projects has commenced before 2023 or is planned to end beyond 2025. 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 2023 - 2025 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
I. 2023-2025 RECONSTRUCTIONS, REHABILITATIONS AND OVERHAULS		
1. Investments in Compressor stations:		
Reconstructions and rehabilitations of CS Polski Senovets and CS Valchi dol	2024-2025	3,690
CS Valchi dol – repair of complex distribution switches 6 kV	2023	1,788
2. Investments in existing AGRS and GRS		
Reconstruction, reorganization and modernization of AGRS and GRS: AGRS Samokov – new external power supply, GRS Strashimirovo – external power supply, GRS Pleven - its own water source for fire fighting needs, AGRS Kubrat - new external power supply, construction of flood defences at GRS-2	2023-2024	348
3. Chiren UGS		
Overhaul, modernization and reconstruction of major technological installations and systems at Chiren UGS – decrease in vibrations of the gas motor compressors and the technological lines from gas motor compressor to II sand damper; construction of boilers room and replacement of a boiler	2023	165
4. 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	2023-2024	42,045

Natural gas transmission and storage infrastructure development projects in the period 2023 - 2025 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
5. License No Л-214-09 of 29 November 2006.		
Reconstruction of protective facilities, restoration of ground cover of the gas pipeline to Greece and North Macedonia, reconstruction or repair of pigging facilities: PF Stryama; PF Kardam of TG1 DN 1200; PF Kardam, PF Odrinci, PF Rupcha and PF Lozenets of TG2 DN 1200; Reverse connection of TG1 (transit gas pipeline) at CS Lozenets and reconstruction of PF Lozenets 1; Reverse connection at CS Ihtiman; HDD drilling of the gas pipeline to Greece where it crosses Stryama river at firefighting valve (FV) 12031205 (Topolnitsa village) and at FV+812 (Slivnitsa village); reinforcement of the river bank of Stryama river at FV 840+300 (Krushitsa village)	2022-2024	11,720
Repair of a gas pipeline Dn 1000 to the Republic of Turkey in the sections between CS Strandja and the Bulgarian - Turkish border; Repair of a gas pipeline DN 1000 to the Hellenic Republic and the Republic of North North Macedonia in the section between LV Yavorovo and LV Gorno Belevo; Repair by means of replacement of a 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	2023-2024	87,164
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-receive chambers) for gas pipeline branches Dimitrovgrad, Sevlievo, Razgrad, Plovdiv, Pernik	2023 – 2025	3,059
Gas pipeline from Chiren UGS to VA Butan	2023 - 2024	86,267
AGRS Dermantsi – for gas pipeline branch Lukovit, VA Dermantsi	2023 - 2024	1,510
Technological connection and regulating assembly Osikovo	2023 - 2024	3,025
2. Investments in auxiliary networks		
New external power supply and Switchyard of the administrative building of the main office; Yana warehouse - roofed warehouse for pipes and equipment	2023-2025	1,772
LNG terminal near Alexandroupolis	2023	7,471

Natural gas transmission and storage infrastructure development projects in the period 2023 - 2025 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
New information system for the collection, archive and visualization of technological information from Bulgartransgaz EAD gas transmission network	2023 – 2024	7,500
III. ACCESS OF NEW MUNICIPALITIES AND NEW END USERS TO NATURAL GAS		
1. Investments in projects for expansion of the existing gas transmission networks to new regions of the country		
Gas transmission pipeline with AGRS to Panagjurishte and Pirdop	2023	5,401
Construction of gas transmission pipelines with AGRS to Bansko and Razlog	2023-2025	32,927
2. 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	2023-2025	500

2. NATURAL GAS TRANSMISSION AND STORAGE DEVELOPMENT INVESTMENTS OVER THE PERIOD 2023 – 2032 UNDER PROJECTS WITH AN INTERNATIONAL DIMENSION

The investments that depend on the development of international projects, 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 2023 - 2032 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
I. PROJECTS PROVIDING THE OPPORTUNITY TO DIVERSIFY THE GAS SUPPLY SOURCES AND ROUTES		
1. Interconnections		
Interconnection Bulgaria-Serbia (IBS)	2023	140,871
2. Natural gas storage		
Expansion of Chiren UGS capacity – above – ground part ² and wells	2023 - 2024	503,708

The financial resources for the project Interconnection Bulgaria-Serbia represent the funding that is envisaged to be secured by Bulgartransgaz EAD.

The funds under item 2 represent the forecast value of the costs for the design,

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).

construction, construction supervision and cushion gas. The total estimated value of the project 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 2023 - 2032 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.

Table No. 3

Natural gas transmission and storage infrastructure development projects in the period 2023 - 2032 for which no investment decision has been taken	Forecast implementation period	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	2023-2024	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	2023-2025	1,990
3. Total for distribution		
3.1. Design, construction and commissioning of infrastructure suitable for transport of hydrogen and low-carbon gaseous fuels to supply customers in the Eastern Maritsa coal basin	2023-2026	362,676
3.2. Building a "future-proof" gas infrastructure to increase the technical capacity for gas transmission from Greece to Bulgaria at IP Kulata/Sidirokastro and from Bulgaria to North Macedonia at IP Kyustendil/Zidilovo	2023-2025	278,819
3.3. Building a "future-proof" gas infrastructure to increase the technical gas transmission capacity in Bulgaria - Romania direction	2023-2025	393,673
3.4. Retrofitting of the existing gas transmission network and associated network assets the for efficient integration of low-carbon and renewable gases	2023-2027	857,602

The funds under position 3 of Table 3 represent an estimate of the investment.

4. 2023 – 2032 INVESTMENT PROGRAMME

This Section presents Bulgartransgaz EAD Investment Programme for the period 2023-2032 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 (2023-2025) including investment activities on which final investment decision has been taken

in BGN thousand, VAT excluded

Programme/Section	Total 2023	Total 2024	Total 2025
TOTAL Annual Programme for Investments:	391,289	562,643	25,260
<i>SECTION I.1 - Construction of new sites</i>	<i>340,042</i>	<i>449,416</i>	<i>12,692</i>
<i>Gas transmission network</i>	<i>175 972</i>	<i>93 404</i>	<i>9 323</i>
Pipeline network	175 176	92 803	5 580
Compressor stations, administrative and operating regions	30	305	924
Communication and information systems	386	163	2,686
AGRS and GMS	380	133	133
<i>Natural gas storage</i>	<i>152,179</i>	<i>351,529</i>	<i>0</i>
Expansion of Chiren UGS capacity	152,179	351,529	0
<i>Total for allocation by types of activities</i>	<i>11,891</i>	<i>4,483</i>	<i>3,369</i>
Pipeline network	7,471	0	0
Compressor stations, administrative and operating regions	420	983	3,369
Chief Dispatching Division	4,000	3,500	0
<i>SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets</i>	<i>42,771</i>	<i>107,226</i>	<i>5,068</i>
<i>Gas transmission network</i>	<i>40 826</i>	<i>104 778</i>	<i>3 593</i>
Pipeline network	38 823	102 936	0
Compressor stations, administrative and operating regions	1 842	1 555	3 543
AGRS and GMS	161	287	50
<i>Natural gas storage</i>	<i>165</i>	<i>165</i>	<i>165</i>
Main technological installations and systems, operating unit	165	165	165
<i>Total for allocation by types of activities</i>	<i>1,780</i>	<i>2,284</i>	<i>1,310</i>
Pipeline network	1,640	1,500	0
Compressor stations, administrative and operating regions	128	784	1,310
Communication and information systems	12	0	0
<i>SECTION I.3 - Supply of machinery and equipment</i>	<i>8,476</i>	<i>6,000</i>	<i>7,500</i>

4.2. 2026-2032 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
	2026	2027	2028	2029	2030	2031	2032
TOTAL Annual Programme for Investments:	25,740	26,127	27,558	28,036	29,563	30,141	31,273
SECTION I.1 - Construction of new sites	15,420	16,191	17,001	17,851	18,743	19,680	20,664
SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets	2,320	2,436	2,558	2,686	2,820	2,961	3,109
SECTION I.3 - Supply of machinery and equipment	8,000	7,500	8,000	7,500	8,000	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 projects for the Southern Gas Corridor development and 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:

- the Interconnection Bulgaria-Serbia;
- the Expansion of Chiren UGS capacity;
- the LNG terminal near Alexandroupolis.
- Infrastructure envelopment projects for the increase of the transmission capacities from Greece to Bulgaria and from Bulgaria to Romania.

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 develops the following hydrogen-oriented projects (detailed information is provided in item 5.2 below):

- Construction of H₂ transmission system in Bulgaria;
- Retrofitting of the existing Bulgarian gas transmission network and associated network assets to effectively integrate low carbon and renewable gases;
- Project for infrastructure for transport of hydrogen and low-carbon gaseous fuels in the Maritsa East Coal Basin.

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.

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.

Cluster of infrastructure development and enhancement enabling the Balkan Gas Hub is included in the fifth list of projects of common interest of the EC (6.8 Cluster of infrastructure development and enhancement enabling the Balkan Gas Hub). Two projects that are important for the achievement of the cluster objectives were completed in 2022 - Phase 2 of the project for the modernisation and rehabilitation of the gas transmission system of Bulgartransgaz EAD and the Interconnection with Greece (IGB).

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.

The realisation of the **Bulgaria - Serbia interconnection** will achieve diversification of the routes, interconnection and natural gas transmission to Serbia via new routes, using alternative sources from South East Europe, and for Bulgaria from Western Europe.

Being part of the priority projects for Europe, the Interconnection Bulgaria – Serbia has been acknowledged to be key infrastructure that will contribute significantly to the improvement of the energy interconnectivity. The contribution of the project to the accomplishment of the

single objectives of the EU member states is also taken into account, namely affordable, secure and sustainable energy for all citizens, and in a longer term the decarbonisation of the economy. Natural gas shall have a key role in achieving these objectives in the Eastern Europe countries.

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 unlimited sources. The project implementation will thus enhance the diversification of natural gas sources and will promote competition for the benefit of end users.

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 from the US, Qatar, Egypt and other countries.

In the context of the Strategic Cooperation Agreement between the EU and Azerbaijan and the objectives of the REPowerEU Plan for accelerated diversification, increase in the LNG use and ending the dependence on Russian sources, the projects for **the increase of transmission capacities from Greece to Bulgaria and from Bulgaria to Romania**, remain key for Bulgaria which is geographically located at the entry of the expected increased flows of LNG and gas pipeline gas from alternative sources.

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.

Interconnection Bulgaria-Serbia (IBS) on the Bulgarian territory, PCI 6.8.3



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

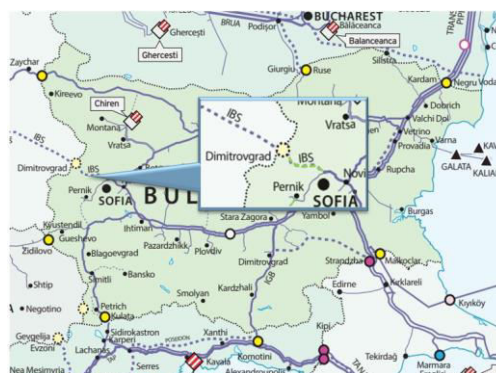


OPERATIONAL PROGRAMME
INNOVATIONS AND
COMPETITIVENESS



Co-funded by
the European Union

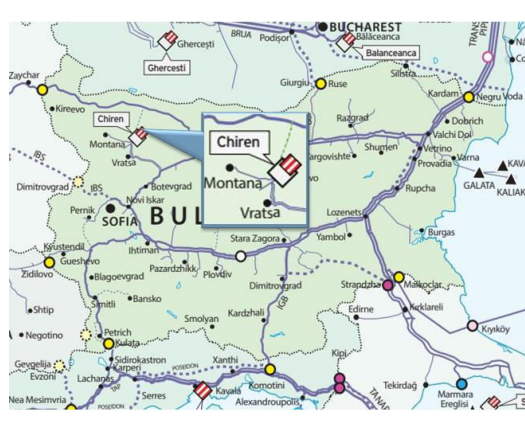
Identification of the project in lists: PCI 6.8.3 INTERCONNECTION BULGARIA-SERBIA (IBS) CESEC priority project A project of national significance in accordance with Decision 111 from 10.02.2013 Council of Ministers	
Type of the project: Gas pipeline and auxiliary equipment	
Description of the project: A new reversible interconnection between the gas transmission systems of the Republic of Bulgaria and the Republic of Serbia. Technical data: A new gas pipeline with a total length of 170 km of which about 62 km on the Bulgarian territory, DN700 Capacity: ~1.8 bcm/y with a reverse flow option Technological sites: Gas metering station, 2 automatic gas distribution stations and gas pipeline branches, cleaning facilities, valve groups Commencement: the region of the town of Novi Iskar, Republic of Bulgaria End location: Bulgarian-Serbian border.	
Expected amount of the investment: ~ EUR 81 million, VAT excluded.	Funding: 1. Bulgartrngaz EAD own funds; 2. Co-financing from Operational Programme Innovation and Competitiveness 2014-2020 (OPIC) up to EUR 2,8 million (Project No. BG16RFOP002-4.003-0001-C01); 3. Co-financing from the Connecting Europe Facility (CEF) amounting to EUR 27,603 million (Action No. 6.8.3-0013-BG-W-M-18)
Expected commissioning date:	2023
PROJECT PHASES	Contruction works
Current status of project implementation: 05/2022: A signed contract for a detailed design, supply of materials and equipment, construction and commissioning of construction site; 11/2022: Commencement of the works: Opened construction sites for the stages Pipeline Network, AGRS Dragoman and AGRS Slivnitsa; 01/2023: The required quantity of pipes has been supplied, DN 700.	
Expected benefits: Diversification of natural gas supplies to Bulgaria and the region. Enhancing the security of supply to Bulgaria and the region; Incentivising the gradual increase in natural gas consumption; Encouraging investors interest and generating economic benefits for the regions through which the gas pipeline passes.	
Project website: https://www.bulgartrngaz.bg/ibs	



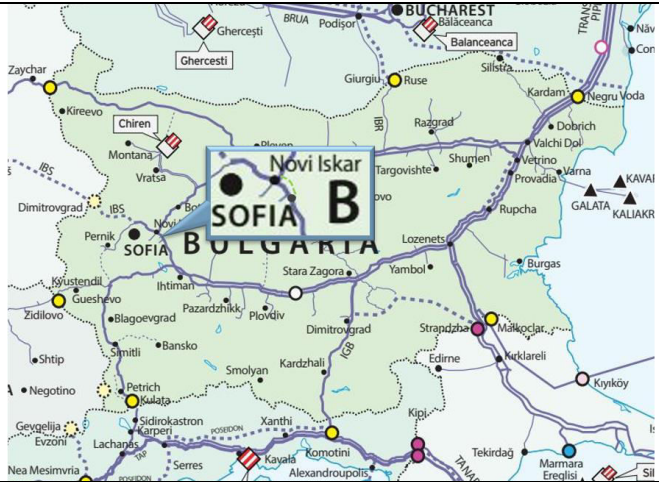
Expansion of Chiren UGS capacity, PCI 6.20.2



Co-funded by
the European Union

Identification of the project in lists: PCI 6.20.2 Chiren UGS Expansion Part of Cluster 6.20 for the increase of storage capacity in South-Eastern Europe A national site in accordance with Decision 709 of the Council of Ministers	
Type of the project: Underground gas storage	
Description of the project: Chiren UGS expansion - increase in the active gas to 1 bcm and increase in the injection and withdrawal capacity 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 observational wells, gatherings, auxiliary activities, etc. - Gas pipeline from Chiren UGS to the existing gas transmission network of Bulgartrngaz EAD with a length of ~ 41 km and DN700.	
Expected amount of the investment: ~ EUR 308 million, VAT excluded.	Funding: 1. Bulgartrngaz 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 PHASES	Procurement and construction
Current status of project implementation: Above ground equipment: Developed Investment Design - Detailed Design Phase; Approved design for DSP-PP and DSP-CP. 01/2023: A signed contract for the supply of the necessary materials and equipment, construction and commissioning of a site „Expansion of Chiren UGS capacity - above-ground“ Wells: - A Contractor under the public procurement for the design and construction works has been selected Gas pipeline: - A Contractor under the public procurement for Investment design, supply of the necessary materials and equipment, construction and commissioning has been selected	
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, схъвкасхж LNG.	
Project website: https://www.bulgartrngaz.bg/chiren	

The Alexandroupolis Independent Natural Gas System (INGS)	
Identification of the project in lists: CESEC priority project	
Type of the project: Floating terminal for reception, storage and re-gasification of LNG	
Description of the Project: It is located 17.6 km SW from the port of Alexandroupolis and about 10 km from the shore. The facility will be linked to the national gas transmission system of Greece and the Bulgarian gas transmission system via the existing IP Kulata/Sidirocastro and the Inetrconnection Bulgaria –Greece. 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	
Expected commissioning date:	01/01/2024
PROJECT PHASES	Execution of construction works
Current status of project implementation: 01/2022: A final investment decision has been made by all shareholders for the construction of the project; 05/2022: Start of construction works	
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 stake 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 transmission system - Phase 3, PCI 6.8.2	
Identification of the project in lists: PCI 6.8.2. Rehabilitation, modernization and expansion of the Bulgarian transmission system CESEC priority project	
Type of the project: Gas pipeline and auxiliary equipment	
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 PHASES	Planning
Expected benefits: The increase of capacity of the Interconnection Bulgaria - Serbia (IBS) from 1,8 to 2,4 bcm/y.	
Project website: https://www.bulgartransgaz.bg/rehabilitaciya	

A project for the construction of a future-proof gas infrastructure to increase the technical gas transmission capacity in Bulgaria - Romania direction

Identification of the project in lists:
Project TRA-N-1124, TYNDP2022 of ENTSG

Type of the project: Future-proof gas infrastructure – a gas pipeline and auxiliary equipment

Description of the project: Increasing the capacity for natural gas transmission in direction from Bulgaria to Romania.

Technical data:

A new gas pipeline/looping (Rupcha-Vetrino) with a total length of 63 km, DN1200
Activities reversing compressor station (CS) Kardam and expansion of capacity of its control system

Additional capacity from Bulgaria to Romania in the amount of 137.15 GWh/d;



Expected amount of the investment:

~ 201 million €

Expected commissioning date:

2026

Project phases:

Planning

Expected benefits:

Boosting the interconnection between Bulgaria and Romania;
Ensuring access to additional LNG quantities and gas from alternative sources;
Infrastructure suitable for the transport of 100% hydrogen;
A possibility to transport low-carbon gaseous fuels.

A project for the construction of a future-proof gas infrastructure to increase the technical gas transmission capacity to Bulgaria and from Bulgaria to North Macedonia	
Identification of the project in lists: Project TRA-N-1140, TYNDP2022 of ENTSG	
Type of the project: Future-proof gas infrastructure – a gas pipeline and auxiliary equipment	
Description of the project: Increasing the technical gas transmission capacity from Greece to Bulgaria and from Bulgaria to North Macedonia. Technical data: A new gas pipeline/looping with a total length of 47 km, DN 700 (Kulata-Kresna) A new gas pipeline with a total length of 50 km, DN 500 (Piperevo-Pernik). Ensuring additional capacity: - from Greece to Bulgaria: 35.365 GWh/d; - from Bulgaria to Greece: 13.05 GWh/d; - from Bulgaria to North Macedonia: 5.383 GWh/d;	
Expected amount of the investment:	~ 142 million €
Expected commissioning date:	2025
Project phases:	Planning
Expected benefits: Boosting the interconnection between Bulgaria and Greece and North Macedonia. Ensuring access to additional LNG quantities and gas from alternative sources; Reducing emissions when replacing coal currently used by consumers by providing access to natural gas infrastructure; Infrastructure suitable for the transport of 100% hydrogen.	

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

The project for the construction of a hydrogen transmission infrastructure on the territory of Bulgaria has the full potential to acquire the status of a project of common European interest. Its objective is to establish a hydrogen transmission network in Bulgaria with a transmission possibility from/to Greece, with connectivity to a similar hydrogen infrastructure on Greek territory, with DESFA S.A. as operator. The planned infrastructure will subsequently be developed on the territory of Bulgaria and will provide additional cross-border connectivity, including with Romania. The new hydrogen infrastructure is a suitable part of a future H2 route from South East to Central Europe.

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.

Bulgartransgaz EAD has developed a project concept for a hydrogen-ready infrastructure (Project for infrastructure for transport of hydrogen and low-carbon gaseous fuels in the Maritsa East Coal Basin) suitable for the transport of natural gas, hydrogen and other low carbon gaseous fuels and their mixtures.

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.

H2 transmission infrastructure in Bulgaria	
Project identification in lists: Project HYD-N-788, ENTSG TYNDP2022 Applied for inclusion in the first PCI list under the new TEN-E Regulation (EU/2022/869) Part of the EHB H2 network development scenarios	
Project type: 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 the 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 Dupnitsa. Start: Sofia Region, Republic of Bulgaria End: Sidirokastro Region, Republic of Greece	
Expected amount of the investment:	~ EUR 860 million, VAT excluded.
Expected commissioning date:	2029
Project phase:	Early phase of development
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.	

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, ENTSG TYNDP2022 (*initial project idea*)

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

Part of the EHB H2 network development scenarios

Project type: Technology 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 monitoring, control and management of the transmission.

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 PHASES

Exploration

Expected benefits:

Reducing greenhouse gas emissions;

Achieving a gradual decarbonisation of the energy sector and the economy, and providing conditions to boost the competitiveness of the 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.

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 - Strumica.

The development of the interconnection between the Republic of Bulgaria and the Republic of North Macedonia will contribute to improving energy security and integration of the energy markets.

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 and
- 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 are discussing conducting a market test for the project in order to decide on the implementation of the interconnector.

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. In addition to supporting the economy, the expansion of the gas network to new regions is directly related to the development of the regions concerned - in business and social terms, providing access to a sustainable and environmentally friendly energy source such as the natural gas creates the 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.

5.3.2.1. Projects in progress

- **Gas pipeline branch Razlog - Bansko**

The gas pipeline design length is approximately 37 km, maximum flow rate 30,000 m³/h, diameter DN 250 and operating pressure of PN 54 bar. The route of the gas pipeline is expected to run on the north slopes of Pirin mountain, continue on the south slopes of Rila mountain and reach AGRS Razlog-Bansko, located in the lands of the town of Razlog near the border with the lands of the town of Bansko.

The project is funded by a grant under Kozloduy International Decommissioning Fund to the amount of EUR 195.5 thousand. The currently expected co-financing from Bulgartransgaz EAD amounts to EUR 14.767 million, with additional investments for state fees, easement establishment, compensations, archaeological surveys, consultant under Article 166 of the

PPA, etc.

A contract has been signed and is being implemented for the preparation of a technical and detailed design, detailed spatial plan (DSP) and EIA. An EIA Decision No 4-4/2018 has been issued for the site. A Detailed Spatial Plan - Parcelling Plan has been approved and enforced. The investment design has been prepared - phase Technical Design that is coordinated with the control bodies and interested parties. The activities involving the acquisition of all rights in rem are ongoing. The planned deadline for completion of the project is the end of 2025.

- **Gas pipeline branch Panagiurishte - Pirdop**

The gas pipeline design length is approximately 62 km, maximum flow rate 25,000 m³/h, diameter DN 250 and operating pressure of PN 54 bar. The route of the gas pipeline branch is as follows: From VA (valve assembly) Vinogradets, located on the southern ring of the main gas pipeline to AGRS to the west of the town of Panagiurishte and route from the town of Panagiuriste to AGRS to the west of the town of Pirdop.

The project is funded by a grant under Kozloduy International Decommissioning Fund to the amount of EUR 6.834 million. The currently expected co-financing by Bulgartransgaz EAD amounts to EUR 12.888 million, with additional investments for state fees, easement establishment, compensations, etc.

An EIA Decision No 5-4/2018 has been issued for the site. A Detailed Spatial Plan - Parcelling Plan has been approved and enforced. The investment design has been prepared - phase Technical Design that is coordinated with the control bodies and the interested parties.

A public procurement for the procurement of main material and equipment has been launched in line with the rules of the European Bank for Reconstruction and Development on the electronic platform of the Bank <https://ecep.ebrd.com/>. A contract has been signed, and implemented.

A public procurement for the selection of a contractor of the construction and installation works has been organised according to the PPA. A contractor has been selected and a signed contract is in progress.

The project is envisaged to be completed in the first quarter of 2023.

5.3.2.2. Possibilities envisaged for construction of new gas pipeline branches

- **Gas pipeline branch with AGRS Graf Ignatievo to Hisarya – Banya – Karlovo – Sopot**

The gas pipeline expected length is 54 km supplied by the existing main gas pipeline, the Southern semi-ring, between the road Plovdiv – Stroevo – Malak Chardak – Golyam Chardak and the gas pipeline branch to Plovdiv, located approximately 4 km east of the main road Karlovo – Plovdiv. The AGRSs are planned to be in the vicinity of the towns of Sopot and Karlovo (or one AGRS for the two towns). Branches are envisaged to the towns of Hisarya and the town of Banya and the village of Kaloyanovo. The branch could further supply gas also the municipalities of Sopot and Hisarya, the town of Banya, Karlovo and the village of Kaloyanovo.

At this stage, exploratory activities are envisaged to be carried out in order to determine the

scope, manner of implementation, financing and final investment decision.

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

5.4.1. Construction of pigging facilities (launch and receive traps) for gas pipeline branches Devnya, Dimitrovgrad, Plovdiv and Pernik

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 gas transmission pipelines without interrupting the gas flow, and to maintain the design pressure.

In 2022 a public procurement procedure was held, entitled: Spatial planning and preparation of investment design - phase Technical Design for a construction site: Launch and Receiving Traps at Gas Pipeline Branch Plovdiv DN 500 - Launch -Receiving District Heating Company Plovdiv Sever and Launch DN 300 – Receiving DN 300 Heating Station Plovdiv South. A contractor is to be selected.

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.

DEVELOPMENT OF THE CAPACITY OF BULGARTRANGAZ EAD GAS INFRASTRUCTURE IN THE PERIOD 2023-2027

The planned activities for the period 2023-2027 will ensure the adequacy of Bulgartransgaz EAD's 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 2023-2027

As of 1 January, MWh/d	2023	2024	2025	2026	2027
Entry capacity	1,188,700	1,249,520	1,339,413	1,382,878	1,390,438
IP Strandzha 2/Malkoclar	576,412	576,412	576,412	576,412	576,412
IP Negru voda 1	214,418	214,418	214,418	214,418	214,418
Interconnection Ruse/Giurgiu (IBR)	44,261	44,261	44,261	44,261	44,261
Interconnection Greece-Bulgaria (IGB)**	96,662	96,662	178,995	178,995	178,995
Interconnection Bulgaria - Serbia (IBS)*	-	53,260	53,260	53,260	53,260
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**	66,285	66,285	66,285	102,190	102,190
IP Kireevo/Zaycar	337,824	337,824	337,824	337,824	337,824
Exit capacity	1,089,603	1,150,423	1,189,693	1,215,530	1,360,240
IP Negru voda 1/Kardam	156,475	156,475	156,475	156,475	293,625
Exit zone Bulgaria	292,410	292,410	324,120	324,120	324,120
Interconnection Ruse/Giurgiu (IBR)	26,615	26,615	26,615	26,615	26,615
Interconnection Greece-Bulgaria (IGB)**	21,170	21,170	21,170	21,170	21,170
Interconnection Bulgaria - Serbia (IBS)**	-	53,260	53,260	53,260	53,260
IP Kulata/Sidirokastro	117,493	117,493	117,493	130,543	130,543
Kyustendil/Zhidilovo	32,694	32,694	32,694	37,921	37,921
IP Kireevo/Zaycar	401,166	401,166	401,166	401,166	401,166
GMS Chiren	41,580	49,140	56,700	64,260	71,820

* Physical and/or commercial reverse flow capacity.

** These capacities at entry and exit point are design ones and may change after being commissioned.

*** An increase in capacity is possible after 2023 in connection with the implementation by DESFA S.A. of the CS Kipi and CS Ambelia projects.

CONCLUSION

Bulgartransgaz EAD is a company, operating in dynamically changing environment. The company efficiently develops 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 in achieving the EU's 2030 greenhouse gas emission reduction targets. 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 2023-2032 are:

- Maintenance of a 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 the transmission of clean hydrogen.

In the period 2023-2032, 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.

Upon the 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, 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 and along new routes and 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
- 2020 Energy Strategy of Bulgaria amended by Council of Ministers Decision No. 847 of 22 November 2018 and Decision of the National Assembly of 30 November 2018, promulgated in State Gazette 101 of 7 December 2018
- 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 (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)
 - GAMA AD (www.gama.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)
 - ENTSG (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 - Turkey's Energy Profile & 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)
- Information related to natural gas production in Bulgaria, webpage Petroceltic International Plc (former Melrose Resources), (www.petroceltic.com)
- Bulgartransgaz EAD 2023-2027 Business Programme, approved by decision under Protocol No 680/24.01.2023 of Bulgartransgaz EAD Management Board and decision under Protocol No 3/31.01.2023 of Bulgartransgaz EAD Supervisory Board
- Regional Investment Plan 2021 Central and Eastern Europe (www.entsog.eu)
- Regional Investment Plan 2021 South Corridor (www.entsog.eu)
- 2020 ENTSG Ten-Year Network Development Plan (www.entsog.eu)
- EIA – U.S. Energy Information Administration (www.eia.gov)
- IEA – International Energy Agency – Report 2022 (www.iea.org)
- IENE – Institute of Energy for South–East Europe (www.iene.eu)
- GIE – Gas Infrastructure Europe (www.gie.eu)
- Ministry of Energy and Natural Resources – Republic of Turkey (www.enerji.gov.tr)
- IICEC – Istanbul International Center for Energy and Climate (<https://iicec.sabanciuniv.edu/>)
- NER JSC Skopje – Macedonian Energy Resources Skopje (www.mer.com.mk)
- Consilium Europa – (www.consilium.europa.eu)
- Platts (www.platts.com)

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
1	Interconnection Bulgaria-Serbia (IBS)	yes	2023	Bulgartransgaz EAD	~ 81 million €	own and attracted external funding	A total of 170 km; ~ 62 km of which on Bulgarian territory	1.8 bcm/y with a reverse flow option
4	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
5	LNG terminal near Alexandroupolis	yes	2024	Gastrade S.A.	~ 29.6 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 thousand m ³
4	A project for the construction of a future-proof gas infrastructure to increase the technical gas transmission capacity to Bulgaria and from Bulgaria to North Macedonia	no	2025	Bulgartransgaz EAD	~ 142 million €	own and attracted external funding	~ 47 km new gas pipeline/looping, DN700; ~ 50 km new gas pipeline/looping, DN500	Additional capacity: - from Greece to Bulgaria: 3.3 mcm/d; - from Bulgaria to Greece: 1.2 mcm/d; - from Bulgaria to North Macedonia: 0.5 mcm/d;
5	A project for the construction of a future-proof gas infrastructure to increase the technical gas transmission capacity in Bulgaria - Romania direction	no	2026	Gastrade S.A.	~ 201 million €	own and attracted external funding	~ 63 km new gas pipeline/looping, DN1200; Activities reversing compressor station Kardam	Additional capacity from Bulgaria to Romania in the amount of 13 mcm/d

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.

GAS INFRASTRUCTURE OF THE REPUBLIC OF BULGARIA

