2021-2030 TEN-YEAR NETWORK DEVELOPMENT PLAN OF BULGARTRANSGAZ EAD

March 2021

Approved by Decision under Protocol No 516/11.03.2021 of Bulgartransgaz EAD Management Board Meeting

BULGARTRANSGAZ

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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

LNG – Liquefied Natural Gas

GMS – Gas Metering Station

GPB – Gas Pipeline Branch

GRS – Gas Regulation Station

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

EU – European Union

EC – European Commission

EBRD – European Bank for Reconstruction and Development

EIB – European Investment Bank

CEF – Connecting Europe Facility

PCI – Project of Common Interest

GDC – Gas Distribution Company

ME – Ministry of Energy

MRDPW – Ministry of Regional Development and Public Works

EWRC – Energy and Water Regulatory Commission (formerly SEWRC)

BEH – Bulgarian Energy Holding EAD

VA – Valve Assembly

EEC – End Energy Consumption

CS – Compressor Station

PF – Pigging Facility

MPa – Megapascal (unit of pressure)

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.

W – Watt (unit for power)

J – Joule (unit of energy)

EIA – Environmental Impact Assessment

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

PEC – Primary Energy Consumption

BP – Building Permit

CIW – Construction and Installation Works

SMEs – Small and medium-sized enterprises

UGS – Underground Gas Storage

Gas infrastructure of Bulgartransgaz EAD – gas transmission network infrastructure, including national gas transmission network, gas transmission network for transit transmission and underground gas storage in Chiren (Chiren UGS), connected to it;

ENTSOG – European Network of Transmission System Operators for Gas

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

EASTRING – a project for construction of gas transmission infrastructure from Bulgaria through Romania and Hungary to Slovakia;

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

IAP – Ionian Adriatic gas pipeline;

TAP – Trans-Adriatic Pipeline;

TANAP – Trans-Anatolian Natural Gas Pipeline.

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). It was developed for the period 2021-2030 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 and establishment of sustainable, liberalized and interconnected gas market. It is in line with climate and environmental policies of Europe.

The priority activities for development of Bulgartransgaz EAD infrastructure for the period 2021 - 2030 are aimed at modernization, rehabilitation and expansion of the existing main and auxiliary gas transmission infrastructure and its auxiliary facilities, development of interconnectivity, increase of storage capacity and last but not least, construction of new infrastructure suitable for transport of hydrogen and low-carbon fuels. Their implementation will turn Bulgaria into a regional gas distribution hub, contribute to the development of its gasification, as well as to the gradual decarbonisation of energy and economy in the country.

The major objective of the TYNDP is to ensure maximum transparency for the future prospects for development of the gas transmission networks and the natural gas storage facility of the Company. It identifies and analyses the trends and factors determining the necessity of the planned investments, as well as their allocation over time. Thus, information to market participants is provided so as to foster the long-term investment decisions.

The implementation of the investment strategy presented in this TYNDP will provide the opportunity to increase the use of natural gas in the country with the respective economic, social and environmental benefits, and diversify the sources and gas supply routes. It will promote the establishment of a competitive natural gas market and respectively, lead to a wider choice for its participants. This, in turn, would provide price incentives, being the 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 at Sofia with a Decision of Sofia City Court. The owner of 100% of its shares is Bulgarian Energy Holding EAD with principal the Ministry of Energy (ME).

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

Bulgartransgaz EAD is a combined gas operator carrying out 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.

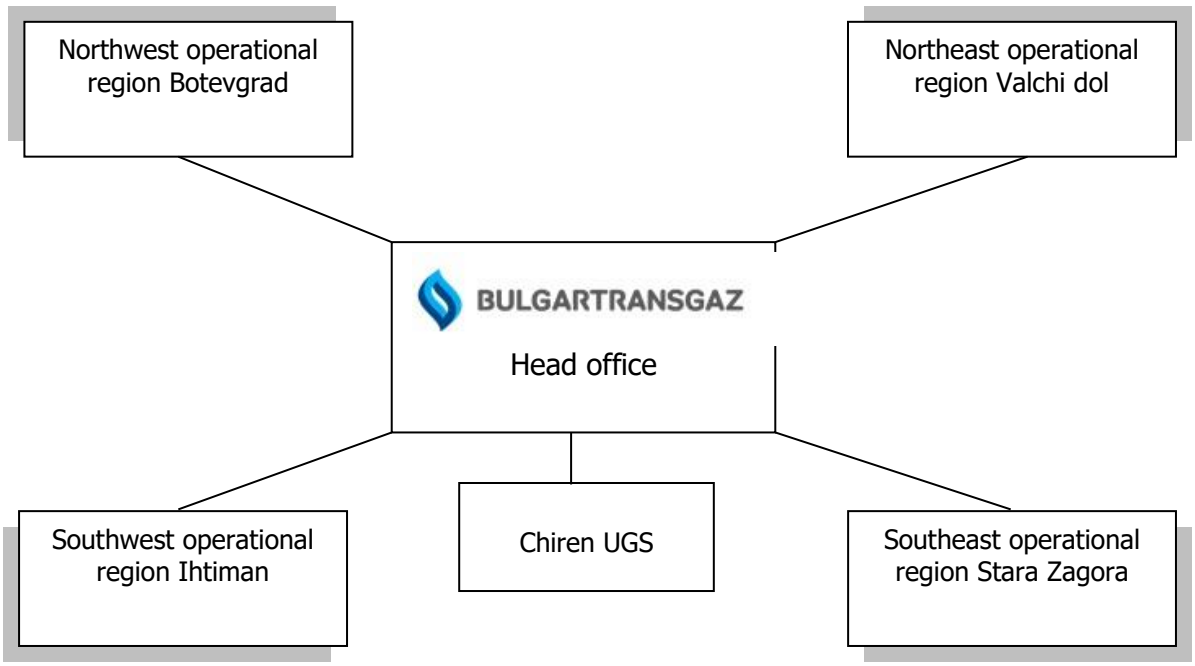
The Company is the holder of the following licenses, issued by the State Energy and Water Regulatory Commission (SEWRC):

- 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 the underground gas storage Chiren. All these services are provided to customers 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 management 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.

Compressor Station Ihtiman

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

Gas transmission network infrastructure that includes national gas transmission network and gas transmission network for transit transmission. It provides natural gas transport to users in the country, as well as to the neighbouring countries Turkey, Greece, Serbia, Romania and North Macedonia. Gas infrastructure comprises of 3,276 km gas pipelines and gas pipeline branches, as well as ten compressor stations – CS Kardam 1, CS Kardam-2, CS Valchi Dol, CS Polski Senovets, CS Rasovo, CS Provadia, CS Lozenets, CS Strandzha, CS Ihtiman and CS Petrich, with approximate total installed capacity of 355 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 10 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 m^3) for withdrawal and 5,285 MWh/d up to 3,824 MWh/d (0.5 to 3.2 mcm/d at 10.57 MWh/1000 m^3) 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 m^3) in case of full gas storage facility and for a short time period (maximum 30 days).

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

following:

Entry/exit 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;

Entry/exit 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;

Entry-exit Interconnection point (IP) Kulata/Sidirocastro – 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 2/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 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;

Transfer point between GTNTT and NGTN – aggregated connection of the gas transmission network for transit transmission and the national gas transmission network enabling transfer between them;

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

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

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

Compressor Station Lozenets

NATURAL GAS MARKET IN BULGARIA

1.1. General Market Overview

Bulgartransgaz EAD transmission 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.

1.1.1. Natural gas consumption

Natural gas consumption in Bulgaria in 2020 has been 31,337 GWh, which shows 2.86% increase compared to the consumption in 2019 (30,465 GWh).

According to data of NSI Overall Energy Balance for 2019, natural gas had a share of 13.13% in primary energy consumption and 12.96% 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

No significant natural gas fields have been found in the Republic of Bulgaria. Consumption in the county is mainly provided through import and with the production of limited natural gas quantities from the fields Galata and GMS Dolni Dabnik.

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.

Until 2019, imports were mainly made via Russia-Ukraine-Moldova-Romania route through IP Negru Voda 1/Kardam and IP Negru Voda 2,3/Kardam. After commissioning of 11 km new gas pipeline from the Bulgarian-Turkish border to Compressor Station Strandzha and the new Gas Metering Station Strandzha, a 576.03 GWh/d import capacity was ensured through a new IP Strandzha 2/Malkoclar at the border with Turkey.

At the end of 2019 and the beginning of 2020, the transmission capacities from Romania to Bulgaria and from Greece to Bulgaria, respectively, have significantly increased.

As of 1 November 2019, the capacity at IP Ruse/Giurgiu in Bulgaria-Romania direction increased up to 26.4 GWh/d, and from Romania to Bulgaria - up to 26.9 GWh/d.

Bulgartransgaz EAD and Transgaz S.A. have signed an Interconnection Agreement for IP Negru Voda 1/Kardam enabling natural gas transmission from Bulgaria to Romania of 121.6 GWh/d capacity.

As a result of the successful cooperation between Bulgartransgaz EAD and DESFA from 1 April 2019, the capacity of IP Kulata/Sidirokastro for transmission in the direction from Greece to Bulgaria increased up to 46.5 GWh/d, and from 1 January 2020 - up to 64.8 GWh/d.

This allowed in 2019 and 2020 significant natural gas quantities to be delivered to Bulgaria from alternative sources, including liquefied natural gas from the United States through the terminal in Revithoussa, Greece.

In 2019 more than 18% of natural gas deliveries to Bulgaria came from alternative sources. For 2020, their share in the overall consumption of the country was nearly 24%.

In 2019 and 2020, the natural gas quantities by sources of supply were as follows:

No.	Type of supply	2019		2020	
		Quantity, GWh	Percentage	Quantity, GWh	Percentage
1	Imported natural gas including	30,390	99.8%	31,011	99.0%
1.1.	Russian Federation	24,802	81.6%	23,602	76.1%
1.2.	Other sources	5,588	18.4%	7,409	23.9%
2	Domestic Production	75	0.2%	326	1.0%
	TOTAL	30,465	100%	31,337	100%

1.1.3. Main natural gas consumers and market participants. Establishment of an organized gas market.

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

- Bulgartransgaz EAD – combined gas operator licensed to perform natural gas transmission and storage 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 transaction for natural gas supply with the public supplier, end suppliers, customers, other natural gas traders, production companies, natural gas storage companies and the combined operator;
- Balkan Gas Hub EAD – Operator of the trading platform, ensuring trading environment for an organized natural gas exchange market at 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 SEWRC;
- Non-household natural gas customers connected to the gas transmission networks;
- Household and non-household natural gas customers connected to the gas distribution networks.
- Bulgartransgaz EAD has contracts for access and transport and/or storage of natural gas signed with more than 70 companies, natural gas traders.

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 2020, on the territory of the Republic of Bulgaria 24 licensed gas distribution companies have operated on 35 licensed territories, covering 173 municipalities, representing 65% of all municipalities in the country. The total number of customers of the gas distribution companies as of 31.12.2020 was 132 424, of which 7772 (5,9%) were non-household customers and 124,652 (94.1%) – household. The number of customers has increased by 10.6% in one year - from 119,745 in 2019 to 132,424 in 2020. Household customers have increased by 11,1% and non-household - by 2,4%.

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 measures have been taken to support end users. New infrastructure for natural gas distribution is also being constructed.

There are a number of projects at different implementation stages leading to an increase in the level of liberalization and liquidity and diversification of the national gas market.

The diversification of sources and routes for natural gas supply is part of the Balkan Gas Hub concept. In addition to improving security of supply in the country and the region, it enables increasing of the degree of liberalization and liquidity of the national gas market.

As a result of the cooperation between the Bulgarian government, the EC and Bulgartransgaz EAD, in the end of 2019 the Balkan Gas Hub EAD trading platform started its operations with the Gas Release Programme by the public supplier. As of early 2020 the short-term segment (spot), long-term segment and brokering service came into life in an environment of growing interest. As of December 2020, 42 participating companies have been registered on the platform.

About 40% of the participants are international companies with experience in natural gas trade in European markets and a rich portfolio, the remaining about 60% are local natural gas traders and large industrial consumers in the country. In addition, in accordance with the requirements of Regulation 312/2014, Bulgartrasngaz EAD fulfils its obligations to perform balancing actions by purchasing and selling short-term standardized products on the trading platform.

In 2020, there is a steady increase in the number of transactions and respectively, traded quantities, compared to the start in January 2020. There is also a convergence of the prices achieved by Balkan Gas Hub EAD compared to those of the developed European hubs. Only a year after its launch, the prices on the Bulgarian natural gas trading platform are very close, and in most cases even lower than the prices achieved at the Central European Gas Hub in Austria.

Implementation of additional products and services, such as introduction of clearing mechanisms covering the entire exchange trade, are a prerequisite for improving liquidity on the Bulgarian market and optimizing the number of traders trading on the exchange, ensuring guaranteed competitive prices for consumers. Thanks to the continuously improvement of interconnectivity, carried out by Bulgartransgaz EAD, this effect will be witnessed not only in the country, but in the entire region as well.

1.1.4. Natural gas storage

Chiren UGS plays a key role in compensating seasonal fluctuations in natural gas consumption and providing an emergency reserve in case of unforeseen and force majeure situations.

The total actually injected quantities in Chiren UGS for 2020 were 3,822 GWh, and virtually - 378 GWh, the withdrawn quantities were 4,369 GWh in real terms and 261 GWh - virtually.

The main user of the natural gas storage services is Bulgargaz EAD. In 2020, there was a significant increase in the quantities stored for the needs of other traders using the service.

1.1.5. Domestic natural gas production

Since 2004 the company Petroceltic Bulgaria EOOD (former Melrose Resources OOD) has started natural gas domestic production firstly from Galata field and then from the newly discovered fields Kaliakra and Kavarna with access to the gas transmission network secured by Bulgartransgaz EAD at entry point GMS Galata. Production was also performed by the company Exploration and Production of Oil and Gas Plc at entry point GMS Dolni Dabnik.

Regarding the oil and gas exploration permits granted by the Ministry of Energy of Bulgaria, there are expectations for increase of the domestic production share and decrease of the country dependence on natural gas imports. The granted permits include sections both onshore, and offshore in the Black Sea.

The company Total, in partnership with Repsol and OMV, has a permit for exploration for oil and gas in Block 1-21 Khan Asparuh in the deep-water part of Black Sea.

In 2016, a contract for exploration for oil and gas in Block 1-14 Silistar/Khan Kubrat was signed with Shell for a 5-year period. In 2019, by a Decision of the Council of Ministers, the Minister of Energy concluded an additional agreement to the contract for oil and natural gas exploration with Shell International Exploration & Development Italy S.P.A., Woodside Energy (Bulgaria) Limited and Repsol Bulgaria Han Kubrat S.A.

Many other concessions for natural gas production were awarded in the country, whereas their production is of limited resource and covers insignificant part of the annual consumption.

In the context of the above, the investment plans of the gas transmission operator Bulgartransgaz EAD will continue to be developed in synergy with the demand forecasts in the country, the potential additional natural gas quantities from domestic production and the import from new and existing entry points.

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 routes for the region.

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

Currently, the share of household gas supply in Bulgaria remains low compared to other EU member states, but with a continuous upward trend. Fostering gasification by expanding the gas transmission network to new regions and providing access to natural gas of new municipalities, distribution companies and customers is a priority of the energy strategy of the Republic of Bulgaria, respectively of Bulgartransgaz EAD activity.

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. The draft National Recovery and Resilience Plan includes a proposal for construction of new gas transmission infrastructure in the coal regions in Bulgaria, suitable for transport of hydrogen and low-carbon gaseous fuels. The new infrastructure is planned to be part of Bulgartransgaz EAD network. It will be accessible to all consumers, including coal-fired power plants.

By construction of the projects for new gas infrastructure in the country and the region and by implementation of the Balkan Gas Hub concept, a significant increase is expected of the natural gas quantities that will be transited through Bulgaria to the countries in the region. The key projects are those for construction of interconnections of Bulgaria with Serbia and Greece - the Interconnectors Bulgaria-Serbia (IBS) and Greece-Bulgaria (IGB).

Balkan Gas Hub has the potential to connect all major gas pipeline projects in Southeast Europe and ensure European consumers transparent and non-discriminatory access to a wide range of supply sources, also from the liquefied natural gas terminals in Greece. The concept is being implemented with the European Commission support.

An important step to achieve diversification and increase the security of natural gas supply is Alexandroupolis Independent Natural Gas System, a high-tech project of a floating terminal for reception, storage and regasification of liquefied natural gas, in which Bulgartransgaz EAD is a shareholder. The terminal will be the second LNG facility in the region after the one in Revithoussa, Greece, to which Bulgaria will have access. The project contributes to implementation of the overall Balkan Gas Hub concept. Thanks to the terminal, the countries in the region will be able to take full advantage of the thriving global LNG market and the competitive prices it offers. Project implementation will enhance the diversification of natural gas sources for the region and will promote competition for the benefit of end users.

Gas infrastructure development and realisation of the concept of a Bulgarian gas distribution hub (Balkan Gas Hub) determine Chiren UGS potential also as a commercial storage facility. The undertaken activities for gradual increase of the storage volume will promote natural gas trade, increase market competition and contribute to the functioning of the liquid gas market.

With regard to the exploration works of domestic natural gas fields and development of concessions in Bulgaria and the region (both onshore and in the Black Sea shelf) the share of domestic production is expected to increase in the next 10 - 15 years.

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

NATURAL GAS MARKET IN THE REGION

According to data of 2020 IEA report, gas demand in Europe will remain stable in the period 2019 - 2025. In recent years, natural gas consumption in the EU has risen after the decline caused mainly by the economic crisis and low coal prices. The gradual recovery of the economy, the commitments to reduce greenhouse gases and the ever-rising price of

emission allowances will inevitably to increase in natural gas demand. At the same time, a number of projects are being implemented to supply natural gas to the European market from new sources and along new routes.

The number and workload of liquefied gas terminals and new gas pipelines for gas import from non-EU countries are increasing. Increasing competition is among the prerequisites for lower prices, which further stimulates demand at the expense of coal and oil. It is expected that in the next years the natural gas role will be retained against the background of the EU's binding commitment to reduce greenhouse gas emissions by 2030 by 40% compared to 1990 and the staged decommissioning of coal and nuclear power.

The growing need of sustainable development of the transport sector also focuses on the use of natural gas as an alternative fuel. In recent years, the shipping industry has also focused on the use of liquefied natural gas.

The development of natural gas market in the region is related to the expectations for consumption growth in the neighbouring countries of Bulgaria. This is largely due to the opportunities for natural gas supplies along new routes and from new sources: Southern Gas Corridor, TurkStream, Expansion of Bulgartransgaz EAD gas transmission infrastructure in the section from the Bulgarian-Turkish to the Bulgarian-Serbian border, LNG terminals, as well as the potential of domestic production.

All perspectives are in line with the plans for construction of new interconnections between the gas transmission systems of Bulgaria and the neighbouring countries, as well as with the implementation of the Balkan Gas Hub. In this context, expansion and modernization of Bulgartransgaz EAD gas transmission infrastructure and the expansion of storage capacity are extremely important.

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

2.1. Greece

Natural gas consumption in Greece has been steadily growing. In 2019 consumption amounted to 5.26 bcm/y whereas electricity generation still keeps a significant share of it.

Consumption in the country is provided mainly by imports through Bulgaria, Turkey and from liquefied natural gas sources. The Greek company DEPA S.A. has concluded contracts for natural gas supply with Gazprom Export LLC, BOTAS and liquefied natural gas with Sonatrach.

DEPA S.A. follows the plans for expansion of the gas distribution network in the country to meet the constantly increasing number of household consumers and the growing consumption.

Other suppliers are also operating on the Greek gas market. Prometheus Gas activities include natural gas supplies, construction of high and low pressure gas pipelines, and of energy facilities for electricity generation in Greece.

The leading Greek industrial company Mytilineos is involved in natural gas trade through

MNG Trading S.A, which delivered the first LNG quantities to the facilities of the Greek gas transmission system operator - DESFA S.A. In mid-2020, Mytilineos signed a long-term contract with Gazprom Export LLC for import of Russian gas until 2030.

Gas transmission infrastructure in Greece

Source: ENTSOG

The Greek gas transmission operator DESFA S.A. is owned by a consortium between Snam, Enagas and Fluxys (66% of the capital) and the Greek state (34% of the capital). The three consortium companies are also shareholders in TAP, which plays a key role in gas transmission along the Southern Gas Corridor.

The construction of other new interconnections is among the priorities that will make supplies to Europe more secure and competitive, relying increasingly on export capacity from the Mediterranean, the Middle East and Central Asia.

Trans Adriatic Pipeline

TAP is the westward continuation of TANAP. The gas pipeline was connected to TANAP at the Turkish-Greek border in November 2018, passes through Greece, Albania, the Adriatic Sea and reaches Southern Italy in its end point. Project's shareholders are BP (20%), SOCAR (20%), Snam S.p.A. (20%), Fluxys (19%), Enagás (16%) and Axpo (5%). Initially, 10 bcm

will be transported along it. In November 2020, the commercial operation of TAP began, considered last component of the Southern Gas Corridor designated for transport of Azerbaijani gas to Europe.

EastMed

In December 2017 Cyprus, Greece, Israel and Italy signed a joint Memorandum of Understanding on the construction of the EastMed gas pipeline. The project provides for natural gas transportation from the fields in the Eastern Mediterranean to Europe through the island of Crete and the mainland of Greece and via IGI to Italy. Their preliminary assessments open excellent opportunities to cover Europe's energy needs in the period until 2040.

Recently Israel announced reserves in Tamar offshore gas fields - 305 bcm, Leviathan - 649 bcm, and the only Cypriot gas field Aphrodite discovered so far has 129 bcm reserves.

An Intergovernmental Agreement on the construction of EastMed gas pipeline was signed in Athens on 2 January 2020. The planned capacity is 10 bcm/y, with the potential to reach 16 bcm upon proven economic interest. The Final Investment Decision is to be taken in 2022 and facility construction is planned to be completed in the end of 2026. EastMed gas pipeline is a PCI in the Fourth PCI list of the EC and has the prospect of becoming an alternative energy corridor for Europe. The United States also support the project.

Bulgaria held preliminary talks on possible future natural gas supply from Israel and Cyprus from the offshore East Mediterranean fields along the possible routes – through EastMed gas pipeline offshore gas pipeline project, by LNG and others.

IGB (Interconnection Greece-Bulgaria) – the gas pipeline is under construction and is expected to run in operation by the end of 2021. The construction of the interconnector is of strategic importance for the implementation of the Vertical Gas Corridor (Greece - Bulgaria - Romania - Hungary), providing access to natural gas from the Southern Gas Corridor and LNG to South Eastern and Central Europe, as well as to Ukraine.

Poseidon

Poseidon is part of the Southern Gas Corridor connecting Turkey-Greece-Italy. The initially envisaged capacity is 15 bcm/y at the Greek-Turkish border and with possibility to increase up to 20 bcm/y. The impplementation 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 included in the Fourth list of projects of common interest (PCI) of the EC.

Ionian Adriatic Pipeline

Plans for TAP expansion to the northwest were developed and possible routes were discussed – the Ionian-Adriatic Gas Pipeline (IAP) of 5 bcm/y capacity to supply gas to Albania, Montenegro, Sothern Croatia and Bosnia and Herzegovina, for which a Memorandum of Understanding was signed between the countries at political level. The IAP gas pipeline is planned to be connected to the Trans-Adriatic Pipeline (TAP) and the TAP consortium has signed a Memorandum of Understanding and cooperation with the TSOs of the respective countries - (BH-gas, Plinacro and Geoplin Plinovodi), and with the Energy Ministries of Albania and Montenegro.

In September 2019 the four gas transmission operators - Montenegro Bonus, Albgaz, BH-Gas and Plinacro agreed to establish a joint venture for gas pipeline construction.

Trans Caspian Pipeline

In 2018, the European Union resumed the negotiations with Azerbaijan and Turkmenistan on the implementation of the Trans-Caspian gas pipeline, included in the Fourth list of projects of "common interest" of the EC, as part of an expanded Southern Gas Corridor, aimed at diversification of Turkmen gas supplies.

Revithoussa LNG Terminal

In order to provide the necessary natural gas quantities in the face of growing domestic consumption, Greece is able to use a variety of supply sources, including the constructed Liquefied natural gas terminal at Revithoussa. In 2019, the first deliveries were made to the Bulgarian liquefied natural gas market, including from the USA. In 2020, significant quantities of US liquefied natural gas were also imported in the Greek market.

The terminal has an annual capacity of up to 7 bcm, with a storage capacity of 225,000 m³. The LNG terminal is still partially used and has available capacity for gas storage and supply. The technical improvements made are also related to a certain extent to the development of Poseidon Med II project (2015-2020), by which part of the terminal's capacity is intended to be used for shipping purposes. Last year utilisation of the facility reached 63%.

Alexandroupolis Independent Natural Gas System

The project for construction of a new LNG terminal in the Aegean Sea – Alexandroupolis, announced by the Greek company Gastrade S.A., is located in strategic proximity to the gas transmission network of DESFA S.A. and is ranked as a project of common interest (PCI) by the European Commission in the Fourth list of the EC.

In February 2017 one of the biggest international fleets – owner of tankers for LNG transport – Gas Log Ltd. acquired 20% of Gastrade S.A. DEPA S.A. has shown interest in this LNG terminal and signed a shareholding agreement.

In March 2020, Gastrade S.A. successfully announced the completion of the binding phase of the market test for capacity reservation.

In August 2020, in Athens, Bualgartransgaz EAD signed the final Agreement for purchase and sale of 20% of Gastrade S.A. capital. On 28 January, 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.

The terminal has 6.1 bcm/y design capacity for regasification and supply to the Greek gas transmission system. The storage capacity is 170 thousand m³. It is expected to be run into commercial operation in early 2024. Among the potential sources of supply are countries producing liquefied natural gas, such as Algeria, Qatar, USA and others.

The project will be in synergy with run into operation TAP, with the Interconnection Bulgarian-Greece (IGB) under construction and the 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.

Gas storages South Kavala

The Fourth list of projects of common interest includes the construction of underground gas storage with 1 bcm planned capacity, as well as a metering and a regulation station. The project consists of transforming the almost depleted underwater natural gas field into an underground storage facility, which has a favorable geological structure and is located close to the existing gas transmission infrastructure, operated by Energean Oil & Gas S.A. In 2020, the concession management agency HRADF announced that it had received three initial bids for a development and management contract from China Machinery Engineering with Maison Group, the Greek DESFA with GEK Terna and Energean Oil & Gas.

Construction of the underground natural gas storage facility will increase security of supply in the Greek market and improve management of the suppliers' portfolio.

Currently, the country does not have its own underground gas storage.

In terms of domestic production, Greece is following its plans to search for and develop new gas fields. In 2019, the country signed a contract on granting rights of exploration and production of hydrocarbons in the offshore areas - West and Southwest Crete with an international Consortium, including Total (40%), ExxonMobil (40%) and the Greek Hellenic Petroleum (20%).

2.2 Turkey

In 2019 natural gas consumption in Turkey amounted to 44.9 bcm, which is a decrease by 9% on an annual basis compared to 2018.

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.

Household and industrial consumption are also expected to increase, along with the construction of more distribution gas pipelines and expansion of the existing distribution networks as a result of privatization of the distribution companies. Turkey aims to become a natural gas trading hub in the region by expanding its gas transmission network, the number of LNG regasification facilities and gas storages. The country has an active energy exchange for natural gas.

Turkey produces small amounts of natural gas, covering an insignificant part of domestic consumption. The share of Russian gas that the country imports through the two gas pipelines across the Black Sea, Blue Stream and TurkStream has been declining 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.

The number of companies licensed to export natural gas from Turkey is increasing and by 2020 they are 18. According to EMRA data, gas export capacity through gas pipelines is between 10 and 15 bcm/y. Since last year, a license for export of natural gas to the territory of the Republic of Bulgaria has been issued to Danske Commodities - a subsidiary of Equinor.

Gas pipelines infrastructure in Turkey

Source: ENTSOG

In order to cover the expected increase in natural gas consumption, Turkey relies on the Trans-Anatolian Gas Pipeline (TANAP), through which natural gas is transported from the Azerbaijani field Shah Deniz II (with proven reserves estimated at 1.2 trillion cubic m) from the Georgian-Turkish border to the western border of Turkey. The first stage capacity is 16 bcm/y, of which 10 bcm/y are being transited to the European markets and 6 bcm/y have been negotiated to cover Turkish domestic consumption. The project is planned to be developed by progressive capacity increase up to 23 bcm/y by 2023, 31 bcm/y by 2026, reaching 60 bcm/y in its last stage. TANAP shareholding is: 51% Southern Gas Corridor, 7% SOCAR Turkey Enerji, 30% BOTAS and 12% for British Petroleum (BP). The first phase of TANAP gas pipeline from the Turkish-Georgian border to Eskisehir was completed in 2018, the second phase of the project from Eskisehir to the Turkish-Greek border was completed in mid-2019 and in September 2.7 bcm gas was transported to Turkey. Exports to Europe began in November 2019.

In 2019, TurkStream offshore gas pipeline, of 31.5 bcm/y design capacity, was run into operation. In 2019, the project company TürkAkım Gaz Taşıma A.Ş. put into operation the gas pipeline from the receiving terminal to the Bulgarian-Turkish border. The trade supplies through the gas pipeline began on 1 January, 2020.

Turkey has four liquefied natural gas terminals (two floating and two on-shore) with a total capacity of supply over 26 bcm/y, and expansion is planned for part of them in the forthcoming years. A third floating terminal (FSRU) is planned to constructed and run into operation by the end of 2021.

The utilisation of LNG terminals in the country reaches 42%. This is mainly due to increased supplies from Algeria. The country also imports liquefied gas from Qatar, the United States and others. For the first time, LNG's share of gas imports to Turkey exceeds 30%.

Currently, the capacity of all gas storage facilities in Turkey, together with the built storage

capacities in the country's operating regasification terminals, exceeds 4.5 bcm. This amounts to about 10% of the overall annual natural gas consumption in Turkey in recent years (45-50 bcm).

According to the plans of the Ministry of Energy of Turkey, in the foreseeable future the country is expected to need about 10 bcm active gas in the period until 2025, to be stored in all underground gas storage facilities, together with the storage capacities in the built regasification terminals. In this regard, the country has been implementing for years a programme for expansion of existing storage facilities and construction of new ones on its territory. Currently Turkey has two gas storage facilities - Tuz Golu - 1 - (Sultanhani, Aksaray) and Silivri (Marmara), with capacity of 1.2 and 2.84 bcm respectively. The expansion of Silivri with additional capacity of 1.5 bcm is forthcoming. The new gas storage facilities, Tarsus with 4.0 bcm planned capacity and Tuz Golu - 2 with 5.0 bcm planned capacity, are also under construction.

There are real opportunities for additional production from SASB gas field, located in the shallow waters of the Black Sea, where Trillion Energy International Inc. operates with a share of 49%. Confirmation of the reserves is still expected and negotiations are under way with drilling companies to begin reconstruction of the gas field, as well as construction of new production platforms. So far, 1.16 bcm have been produced.

In 2020, Turkey announced the discovery of a new deep-water gas field of 320 bcm capacity in Tuna-1 block (renamed the Sakarya gas field) in the West Black Sea. There are plans for production to begin in 2023, and Turkey's TRAO is currently looking for investors.

2.3 Romania

Natural gas consumption in Romania in 2019 totalled to 11.2 bcm. The country meets more than 85% of natural gas demand thanks to domestic production. The necessary additional quantities to cover demand in the country are provided by imports, also through the interconnection points with Bulgaria IP Negru Voda 1/Kardam and IP Ruse/Giurgiu.

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. According to natural gas demand forecasts, Romania's demand is expected to remain in the range of up to about 13 bcm/y in the forthcoming years. In 2019 the Romanian transmission system operator Transgaz S.A. and Central European Gas Hub (CEGH) in Austria signed an agreement on establishment of a Romanian joint stock company Romanian Gas Hub to operate the Romanian Virtual Trading Point (VTP). In this regard, reorganization of activities in the gas sector is planned in order to facilitate gas trade and achieve the most efficient prices with guaranteed quality of services.

The Programme for gas infrastructure development in Romania is bound to a large extent to the development of the Black Sea deposits. In this regard, modernization and expansion are planned of the existing gas corridor connecting the Romanian gas transmission network with the Hungarian one, including gas pipelines and compressor stations. The project is included in the Romanian TSO Transgaz S.A. Ten-Year Network Development Plan.

BRUA (Bulgaria-Romania-Hungary-Austria) – at the end of 2020, Romania announced completion of Phase I of the project, including: a gas pipeline of 479 km between the urban settlements of Podisor and Rekas and three compressor stations Podisor, Bibesti and Jupa, with capability to provide reverse gas transmission. The construction of Podisor compressor station ensured increase in gas transmission capacity to Bulgaria through Ruse-Giurgiu Interconnector.

The state-owned company Transgaz S.A. is responsible for the infrastructure construction on Romanian territory. The project provides 1.5 m³/y bidirectional gas transmission capacity from or to Bulgaria and 4.4 m³/y from or to Hungary. BRUA is a project of "common interest" of the EC, and for its implementation own and attracted funding has been provided.

Project implementation provides a route for natural gas transmission from the Black Sea fields through Romania and Hungary to Baumgarten hub in Austria, as well as reversibility of the interconnection of Romania with Hungary. This will enable access to new gas sources and facilitate the transport of Caspian gas to the markets of Central and Eastern Europe.

Passage through the territory of Romania of the conceptual design "White Stream", which is new gas infrastructure of 16 bcm/y estimated design capacity, intended to transport Caspian gas from Turkmenistan, is being considered.

Romania plans construction of an interconnection between Arad and Mokrin.

Gas Transmission Infrastructure in Romania

Source: ENTSOG

Romania has gas industry with established traditions and significant domestic production. There are 8 gas storage facilities in the country with of natural gas storage volume over 3 bcm active gas. Romania's gas storage development plans envisage a doubling of the storage capacity in the forthcoming years up to approximately 6 bcm, which will cover about half of the country's annual consumption. The expansion of Sarmasel gas storage facility in the period up to 2022 and significant investments in the private gas storage facility Depomures, property of Engie and Romgaz, are envisaged in the Fourth list of projects of common interest in the field of natural gas storage in Romania.

Several gas fields in NeptunDeep deep-water block in the Black Sea are being developed by the Romanian company OMV Petrom (a subsidiary of OMV Austria), together with the American company Exxon Mobil. Some estimates show that the total reserves exceed 170 billion cubic meters. According to data from the initial well Domino-1, field reserves have been estimated within the range of 42 to 84 bcm, with expected annual production levels of 6.5 bcm. In 2019, representatives of ExxonMobil announced their intention to sell the license in the Black Sea aquatory. The consortium of the Romanian oil and gas group OMV Petrom, the Romanian state-owned company S.N.G.N. Romgaz S.A and the Polish PGNiG, is interested in taking the 50% share of the US group in Neptun Deepwater project. At the end of last year, OMV Petrom again postponed its final investment decision for Neptun.

In February 2017 Black Sea Oil & Gas (BSOG), managed by the private investment company Carlyle Group LP, announced discovered reserves in the Black Sea estimated to 10 – 20 bcm. At the end of 2020, it was announced that Romania had started building gas pipelines from the new Black Sea fields and plans to put them into operation in 2021. The company Black Sea Oil & Gas has begun construction of a 126 km gas pipeline from the Black Sea block in Midia shallow waters. There are located Ana and Doina gas fields with reserves of about 10 bcm gas, and production is scheduled to begin in late 2021. The project is expected to provide 1 bcm gas and satisfy 10% of domestic consumption. The Romanian Ministry of Economy, Energy and Business Environment has issued a permit for exploration and development of the project for gas production from both fields.

Since 2018, OMV Retrom has been developing gas fields in the southern part of the country near Mamu gas field, and at the end of 2020 began new offshore drilling activity in the shallow waters of Istria block in the Black Sea.

In the Black Sea in EX-3-Trident block, according to seismic data, the reserves may exceed 30 bcm gas. Lukoil announced its intentions to sell its 87.8% stake in the project. Romgaz, which has a 12.2% stake in the project, is the most likely buyer.

Available natural gas quantities produced from the Romanian aquatory are envisaged to enter also in the Balkan Gas Hub.

2.4 The Republic of North Macedonia

The only interconnection of the Republic of North Macedonia is with Bulgartransgaz EAD gas transmission network with 0.8 bcm/y design capacity. Natural gas consumption in the country is steadily growing compared to previous years and at the end of 2019 reached up to 296 mcm/y, with expectations for a gradual increase in demand.

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 industry 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 heat and power plants (CHP). Increase of gas consumption by households in the country was foretasted as well. Estimates indicate that natural gas demand in the future could reach about 1 bcm/y.

Gas transmission is carried out by GA-MA AD, a shareholding company with two shareholders, holding equal shareholding (50%) - the Macedonian state and the Macedonian company Makpetrol AD.

GA-MA AD has a long-term contract with Gazprom Export OOO with a possibility of delivery up to 800 mcm/y natural gas by 2030.

Gas transmission infrastructure in the Republic of North Macedonia

Source: ENTSOG

Within the framework of CESEC initiative, interconnection projects in a conceptual stage have been proposed, connecting the gas transmission systems of the Republic of North Macedonia with those of Bulgaria and Greece.

In 2019, DESFA S.A., together with MER JSC Skopje, confirmed their intention for construction of the interconnection between Greece and the Republic of North Macedonia pursuant to the Memorandum of Understanding signed in 2016. This project aims at building an "energy bridge" with the Republic of North Macedonia by construction of the gas pipeline

"Pipeline N. Messimvria-Skopje". The interconnector has the status of a "project of common interest" of the Energy Community and its capacity is 3 bcm/y. Currently, the results of the study on the environmental and social impact of the gas pipeline are expected, and construction is planned for 2022. North Macedonia is applying for funding through the Western Balkans Investment Framework (WBIF).

In the future, the country will have access to liquefied natural gas from the terminals in Greece, through the existing Bulgarian gas transmission system and the new interconnectors planned for construction.

2.5. Serbia

Natural gas consumption in Serbia in 2019 amounted to 2.5 bcm/y. Industrial consumers account for 63% of the total consumption, followed by households (20%) and district heating companies (17%).

The Energy Strategy of the Serbian Government envisages increase in natural gas demand in the forthcoming years, driven by the increased household consumption and industrial demand by means of the planned development of distribution networks. The announced plans are also related to Balkan Stream commissioning on Serbian territory.

By the end of 2020, natural gas supplies to Serbia came by the Russian Federation, through Ukraine through the interconnector with Hungary. Since 1 January 2021, after commissioning of Balkan Stream in Serbia, gas enters along the new route through Bulgaria.

Republika Srpska (autonomous part of Bosnia and Herzegovina) announced its intention to connect to the gas pipeline by constructing a gas pipeline branch from the town of Byala (at the border with Serbia) to the town of Banya Luka.

The state gas company JP Srbijagas is discussing opportunities for accelerated construction of domestic and regional gas pipelines in the direction Belgrade-Banja Luka, Belgrade-Valevo and others.

Gas transmission infrastructure in Serbia

Source: ENTSOG

Serbia is developing the opportunities to diversify gas sources and routes through interconnectors with the neighbouring countries. They will also provide access to the LNG terminals in Greece and to the new terminal in Kirk, Croatia. In the future, liquefied natural gas from the terminals in Greece could be supplied to Serbia through Bulgaria.

A significant project is the implementation of the planned Interconnection Bulgaria-Serbia (IBS), which was announced by the EC as a PCI also in the Fourth PCI list. In January 2017, a Memorandum of Understanding was signed by the Energy Ministers of the two countries. The gas pipeline is expected to enable the supply of 1.8 bcm/y. The interconnector is expected to be put into operation by May 2022. It will enable gas import from Azerbaijan, the liquefied gas terminal in Greece or the new Eastern Mediterranean gas pipeline. Funds are provided mainly by European funds, the European Investment Bank and the Serbian budget.

Another project for development of interconnectivity is the construction of an interconnector with Bosnia and Herzegovina (Novo Selo-Bijeljina).

Serbia has expressed interest also in joining all projects related to gasification in order to ensure energy stability and opportunity for gas supplies to Kosovo, the Republic of North Macedonia, Bosnia and Herzegovina and Montenegro (after construction of infrastructure in the country).

In January 2019, Gazprom and JP Srbijagas signed a Memorandum of Understanding regarding the development of the project for expansion of the existing underground gas

storage Banatski Dvor. The plans include a gradual expansion from the current 450 mcm to 750 mcm in the first phase of the project. In the forthcoming years, the possibilities for expansion up to 1.5 - 2 bcm/y gas will be considered, which will cover a significant part of the annual consumption in the country.

2.6 Current status, market potential and development prospects

Intense activities related to the gas infrastructure development are underway in the countries of the region, and there are objective expectations for an increase in the natural gas consumption.

Bulgaria works towards accelerating the process of diversifying its 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. Due to the provided new transport capacities to Bulgaria, significant supplies from alternative sources were realized in 2020, including liquefied natural gas from the terminal in Revithoussa, Greece.

Priority is given to implementation of the Balkan Gas Hub projects, which has the potential to connect the main gas projects in Southeast Europe, ensuring transparent and non-discriminatory access to all potential market players. The infrastructure required for the realization of the concept is being built at accelerated pace: Expansion of Bulgartransgaz EAD gas transmission system from the Bulgarian-Turkish border to the Bulgarian-Serbian border; implementation of interconnections with Greece and Serbia; expansion, rehabilitation and modernization and of the existing network. This contributes to achieving a higher degree of market integration and securing the natural gas supply for the country and the region, providing access to various sources of natural gas and liquefied natural gas 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 staged expansion of Chiren UGS in the period until 2024. Providing additional storage volume will promote natural gas trade, increase market competition and contribute to the functioning of the liquid gas market. 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.

In the last years, Bulgaria made significant investments in rehabilitation, modernization and capacity increase of the existing gas infrastructure.

In the context of the Hydrogen Roadmap Europe and in accordance with the strategic objectives and priorities in the field of energy and climate of Bulgaria, Bulgartransgaz EAD envisages construction of infrastructure for transport of hydrogen and low-carbon gaseous fuels to supply power plants and other consumers in coal regions in Bulgaria.

Thus, 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 of increasing imports and diversifying supply sources and to the

pan-European priorities in the areas of climate and energy.

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

All activities related to the development of the gas transmission system will continue throughout the period of this TYNDP.

According to EU official data, EU accounts for 11.9% of the world natural gas consumption, but at the same time the EU has only 0.6% of the world's reserves. The EU is currently heavily dependent on gas imports. In addition to the gradually decreasing domestic production in the period 2000-2018, this dependency increased from 49% to 76% of the total consumption.

Within the concept of increasing the EU energy security, increase of LNG supply to the member states is set out by construction of infrastructure and ensuring domestic markets access to the global LNG market. In recent years, there has been a serious expansion by the United States and Russia.

The LNG regasification capacity in Europe represents approximately 27% of the world capacity. By 2019, the announced annual capacity of the 28 LNG terminals amounts to approximately 227 bcm. Expansion of some of the current facilities, as well as construction of 22 new terminals is envisaged in the coming years. According to a European Commission's report on the gas and electricity market, during 2019 the record 108 bcm LNG were imported in Europe, which represents an increase of 42% on an annual basis and 22% of the total EU consumption. LNG on the European market comes mainly from Qatar - 30 bcm, Russia - 21 bcm and the U.S. - 17 bcm. Imports from Nigeria, Algeria, Trinidad and Tobago and others also remain significant.

The 2020 ENTSOG Community-Wide Ten-Year Network Development Plan (TYNDP) includes 107 projects for the construction of gas transmission infrastructure, compressor stations and metering stations, 22 projects for LNG terminals and 13 projects for natural gas storage facilities.

On 31 October 2019, the EC published the Fourth List of Projects of Common Interest (PCI). 32 energy infrastructure projects out of 151 are related to gas infrastructure. In the coming years, priority will be given to the PCI implementation compatible with the undertaken ambitious climate and environmental commitments under the European Green Deal which includes a set of policies proposed by the European Commission, which must make Europe climate-neutral until 2050.

Chiren UGS

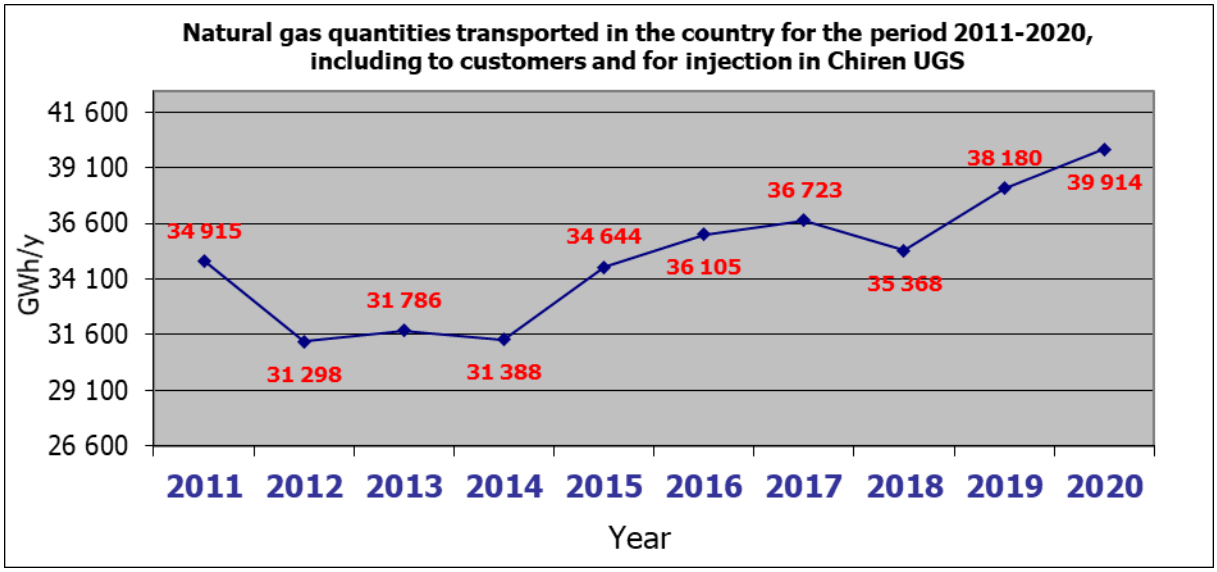
NATURAL GAS TRANSPORT

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

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

The natural gas transported in 2020 amounts to 39,914 GWh (including the quantities transported for injection in Chiren UGS), i.e. an increase of 4.5% compared to 2019 (38,180 GWh), as a result of the increased transport to interconnection exit points.

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 domestic production (31,337 GWh) and respectively the actually transported natural gas quantities (39,914 GWh) differ due to the fact that the transmission activity also includes:

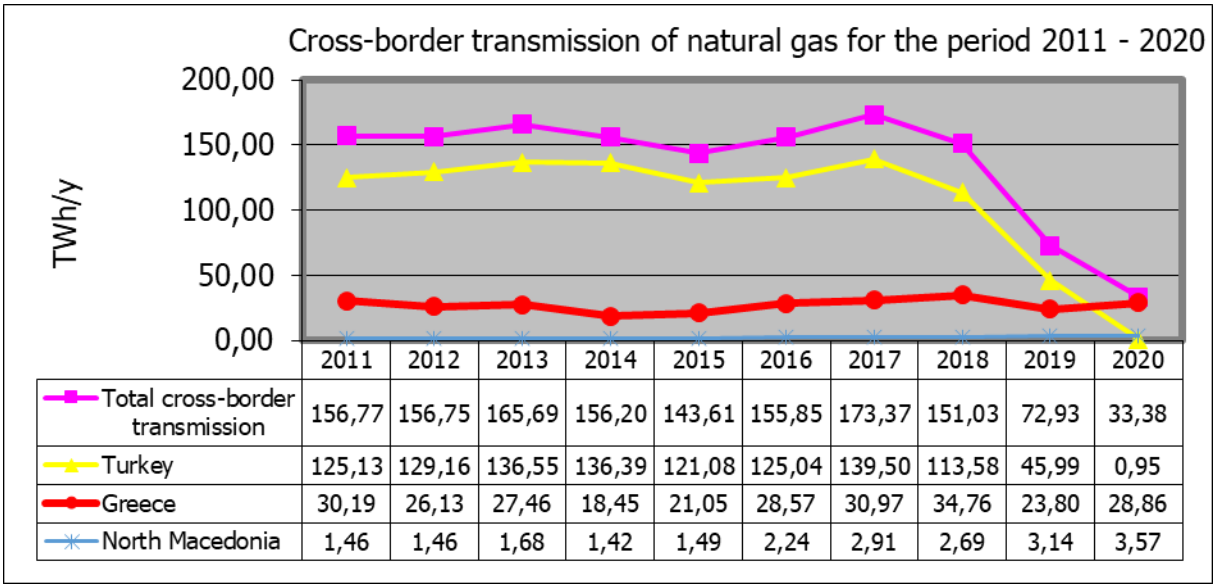
1. Quantities transported for injection in Chiren UGS;
2. Difference between the injected and withdrawn quantities in Chiren UGS;
3. Quantities transported to interconnection exit points (4,755 GWh);
4. Technological losses, technological differences due to the accuracy of the metering devices, etc.

2. CROSS-BORDER NATURAL GAS TRANSPORT

The transported quantities meet 100% of the consumption in North Macedonia and significant part of the consumption in Greece.

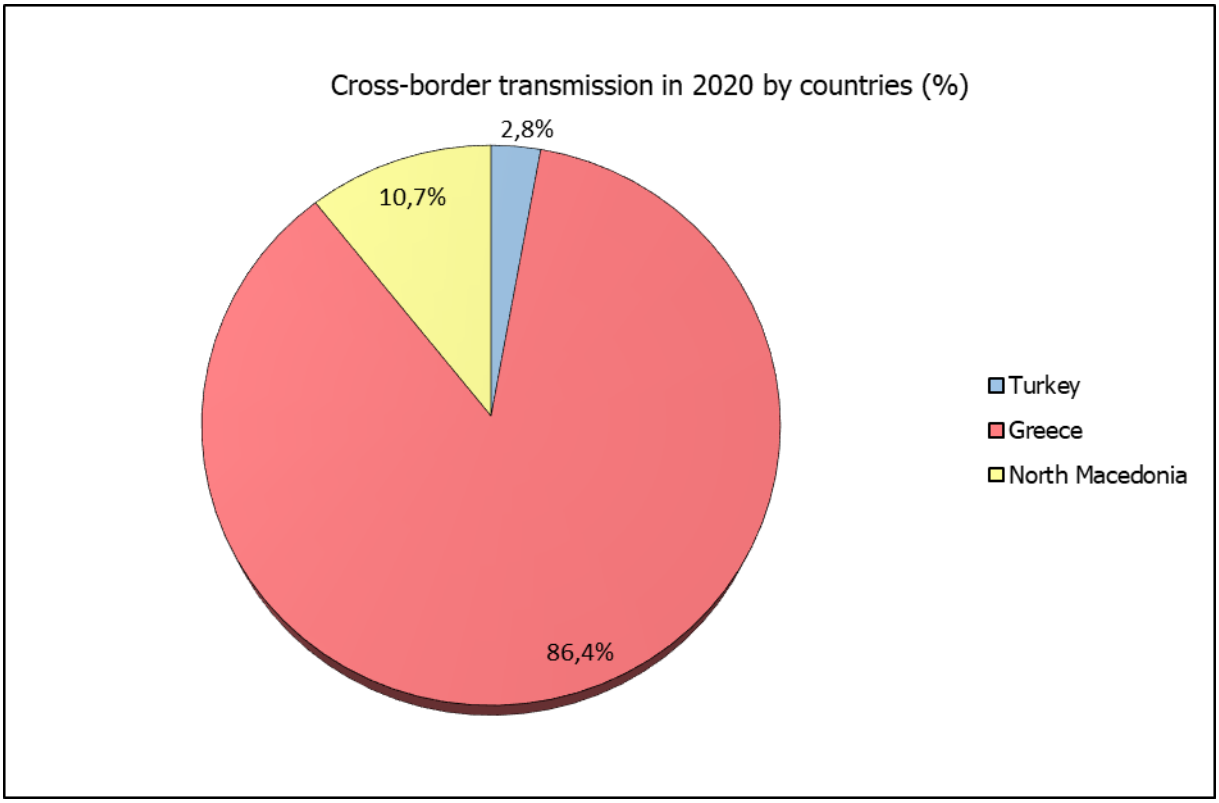
The natural gas quantities physically transported in 2020 amount to 33.38 TWh or 54% less compared to 2019 (72.93 TWh). The temporary decrease in the transport is due to the change in natural gas flows in the region and the commissioning of new transmission infrastructure. It is expected that in the next years, when reaching the maximum design capacity of IP Kireevo/Zaycar and with the implementation of other priority projects in the region, the transported quantities will increase and reach and exceed the levels before 2020.

Cross-border transmission through the territory of Bulgaria for the period 2011-2020 is shown in the diagram below:



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total cross-border transmission	156,77	156,75	165,69	156,20	143,61	155,85	173,37	151,03	72,93	33,38
Turkey	125,13	129,16	136,55	136,39	121,08	125,04	139,50	113,58	45,99	0,95
Greece	30,19	26,13	27,46	18,45	21,05	28,57	30,97	34,76	23,80	28,86
North Macedonia	1,46	1,46	1,68	1,42	1,49	2,24	2,91	2,69	3,14	3,57

The percentage distribution of cross-border transmission in 2020 by countries was:



NATURAL GAS STORAGE

Pursuant to Licence No. L-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 10 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 development of the planned interconnections with Greece and Serbia will enhance the market integration in the region and it is a prerequisite for the Chiren UGS to play an increasingly important role in providing additional flexibility to the gas transmission systems at a regional level.

In this regard, projects for modernization and expansion of the existing gas storage facility in Chiren are undergoing.

The Chiren UGS modernization project in the short term will allow to increase the daily flow rates. In connection with the planned modernization two new deviated operational wells E-72 and E-73 were drilled and commissioned in 2016-2017, which as of 2019 results in an increase in the daily deliverability of the storage facility up to 40.4 GWh/d (49.70 GWh/d in crisis situations).

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. To carry out the overall project, 3D seismic studies were conducted in 2020 to locate areas determining with greater accuracy the location of new operational and monitoring wells. Part of the ground facilities are envisaged for replacement and new modules of the ground infrastructure are to be built. Thus, an increase is envisaged in the active gas volume in the storage facility from 5,814 GWh to 10,570 GWh as well as the daily withdrawal shall increase up to 85-106.4 GWh/d.

In 2019, 4,348 GWh of natural gas were injected and 3,795 GWh were withdrawn, and in 2020, 3,822 GWh of natural gas were injected and 4,369 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 2019 and 2020								
Month	Withdrawal				Injection			
	2019		2020		2019		2020	
	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters	GWh	thousand cubic meters
January	1 060,077	100 168	1 196,952	112 931	-	-	-	-
February	836,213	79 015	874,263	82 485	-	-	-	-
March	497,237	46 985	420,672	39 690	-	-	-	-
April	-	-	13,527	1 284	191,464	18 165	-	-
May	-	-	-	-	846,922	80 140	903,475	85 395
June	-	-	-	-	938,512	88 748	825,389	78 199
July	-	-	-	-	836,388	78 815	734,725	69 524
August	-	-	-	-	638,075	59 998	688,861	65 171
September	-	-	-	-	704,140	66 334	663,287	63 110
October	15,390	1 449	162,728	15 424	192,026	18 085	6,352	602
November	341,210	32 193	574,230	54 405	-	-	-	-
December	1 045,247	98 617	1 126,692	106 735	-	-	-	-
Total:	**3 795**	**358 427**	**4 369**	**412 954**	**4 348**	**410 286**	**3 822**	**362 001**

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

Metering lines in GMS

1. NATURAL GAS DEMAND

Bulgartransgaz EAD demand scenario has been developed taking into account the relationship between 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 well[1].

The main assumptions made based on an analysis of the past ten-year period, a comparative EU gas market analysis and the objectives of the Energy Strategy of Bulgaria[2] are the following:

- Sustainable economic growth of GDP - between 2 and 3% annually;
- There is an increase in the share of natural gas in final consumption in connection with the increase of the level of gasification in the existing gas distribution networks

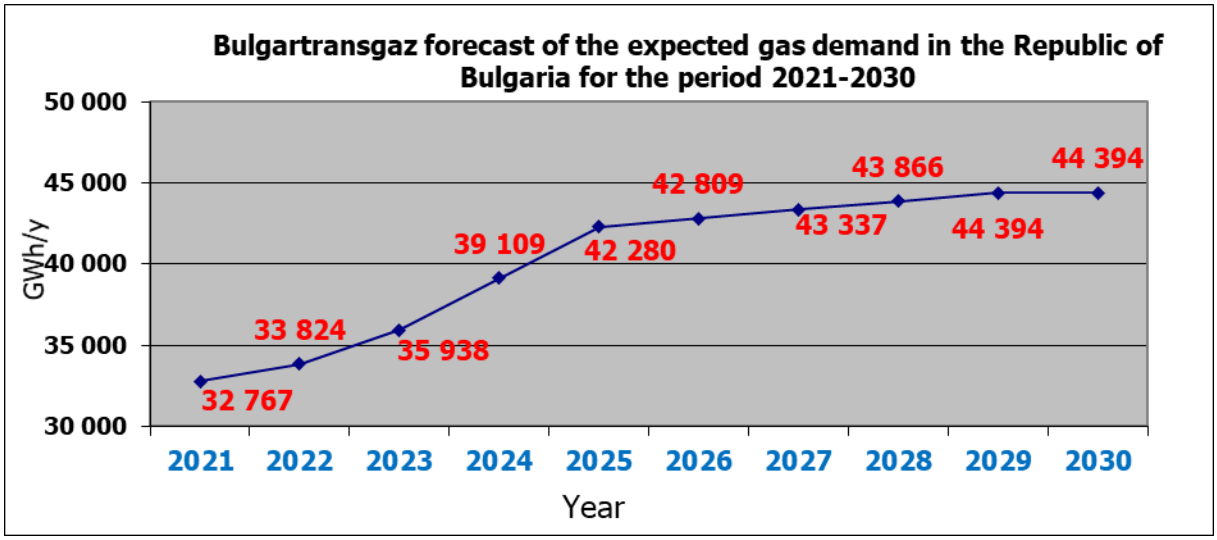
[1] National Statistical Institute, www.nsi.bg; Eurostat, www.epp.eurostat.ec.europa.eu

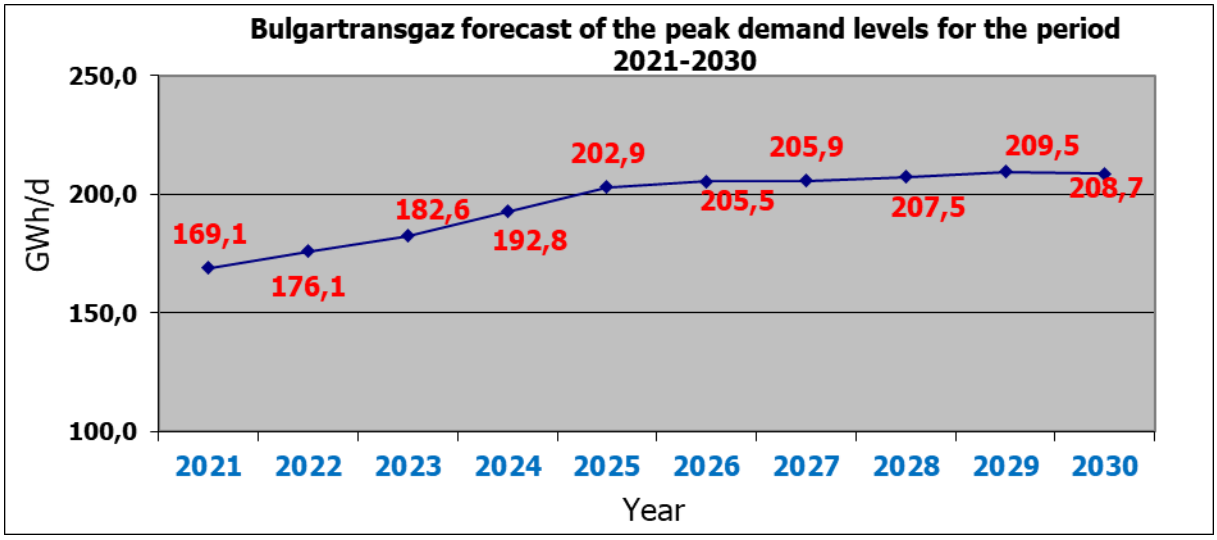
[2] Energy Strategy of Bulgaria till 2020, www.me.government.bg

and the gasification of new regions;

- The share of natural gas in primary energy consumption is increasing, including in connection with increasing the production of heat and electricity from gas.

The forecast on natural gas consumption prepared by Bulgartransgaz EAD for the period and the expected peak daily demand levels during the winter months is shown in the diagrams:



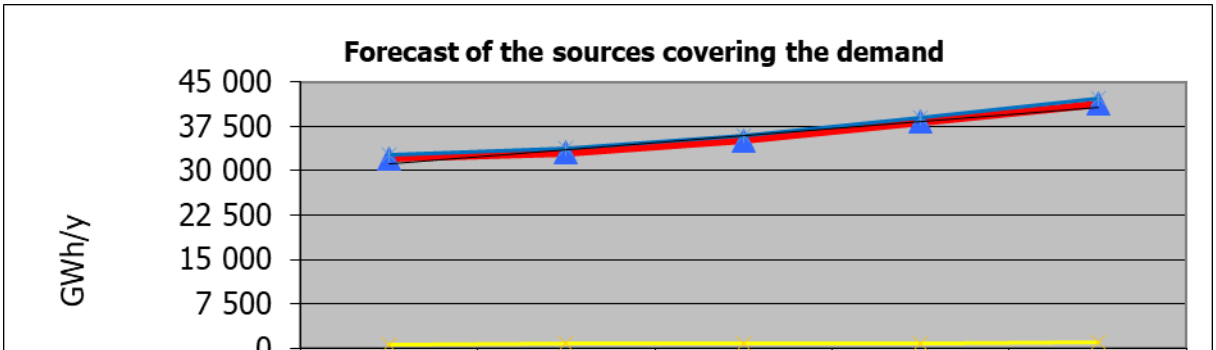


2. SOURCES TO MEET THE DOMESTIC DEMAND

In 2020, natural gas demand has been satisfied as follows:

- Import – 31,337 GWh (99%);
- Domestic production – 326 GWh (1%).

The forecast for the sources to meet the demand for the period 2021-2025 is shown in the diagram below:



	2021	2022	2023	2024	2025
Import	32 133	33 126	35 171	38 265	41 351
Domestic production	634	698	767	844	929
Total	32 767	33 824	35 938	39 109	42 280

2.1 Import

Until 2019 the major part of natural gas import in the country comes from Russia through the territories of Russia, Moldova, Ukraine and Romania. At the end of 2019 and the beginning of 2020, due to the increased transport capacity from Greece and Romania to Bulgaria, supply from alternative suppliers was made. The natural gas mix from imports will be gradually supplemented by new sources, coming from new routes and suppliers resulting from the implementation of the planned new gas projects and developed fields. As of the beginning of 2020 the main natural gas quantities are supplied through the new entry point IP Strandzha 2/Malkoclar. There are also significant supplies from alternative sources through the other entry points of the gas transmission system.

Main natural gas sources for the country and the region within the considered period are:

- Russian natural gas supplied through existing routes;
- Natural gas from sources of the Southern Gas Corridor - the Caspian region, the Middle East and the Eastern Mediterranean by realization of the Interconnection projects, TAP and TANAP;
- LNG from various sources through the LNG facilities in Greece and Turkey, and the plans for capacity increase of the existing terminals, as well as construction of new ones;
- Natural gas from the gas hubs in Central and Western Europe through the planned new gas corridors between the Balkans and Central and Western Europe;
- Domestic production in Bulgaria;
- Domestic production in Romania;
- Natural gas produced from the Black Sea.

2.2. Domestic Production

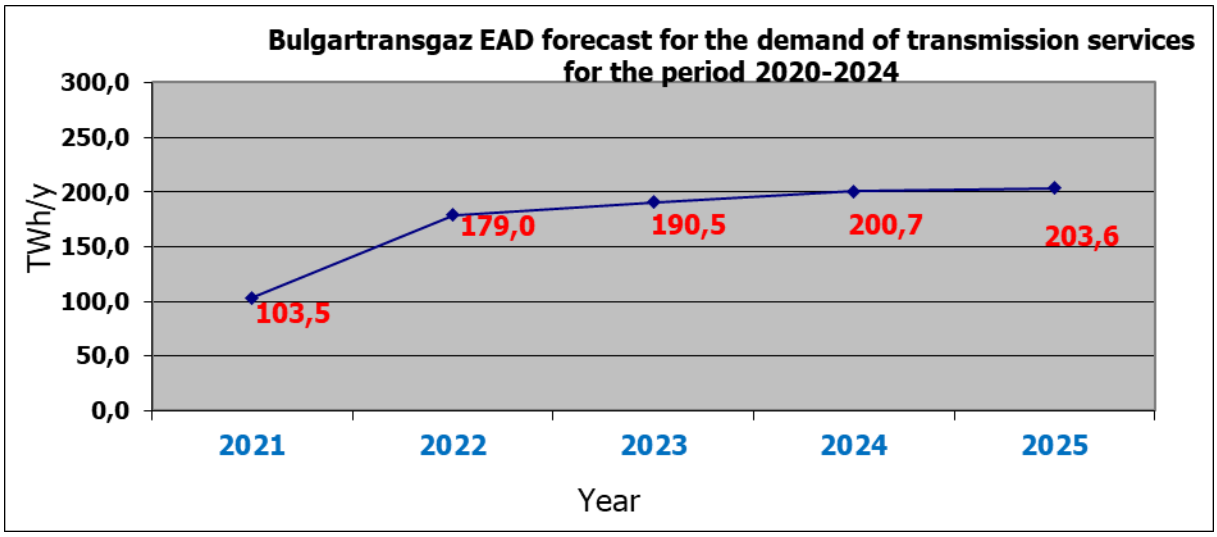
In 2021, domestic production is expected to remain insignificant as a result of the partial depletion of existing deposits. The forecast for an increase in domestic production after 2021 is due to the large number of concessions for exploration of deposits and the existing probability of significant deposits in the Black Sea.

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

Bulgartransgaz EAD expects to see in the coming years an increase in the demand for natural gas transport services in relation to:

- the realisation of the Balkan Gas Hub concept;
- The development of the gas exchange, run by Balkan Gas Hub EAD and the establishment of a liquid regional gas market;
- The expansion of the gas transmission network of Bulgartransgaz EAD in the section from the Bulgarian-Turkish to the Bulgarian-Serbian border;
- The commissioning of the planned new interconnections;
- The modernisation, rehabilitation and reconstruction of the existing infrastructure;
- The expansion of Chiren UGS capacity;
- 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.

The 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 2021 - 2025 according to Article 5 of Regulation (EU) No. 2017/1938 concerning measures to safeguard security of gas supply and repealing Regulation (EU) 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:

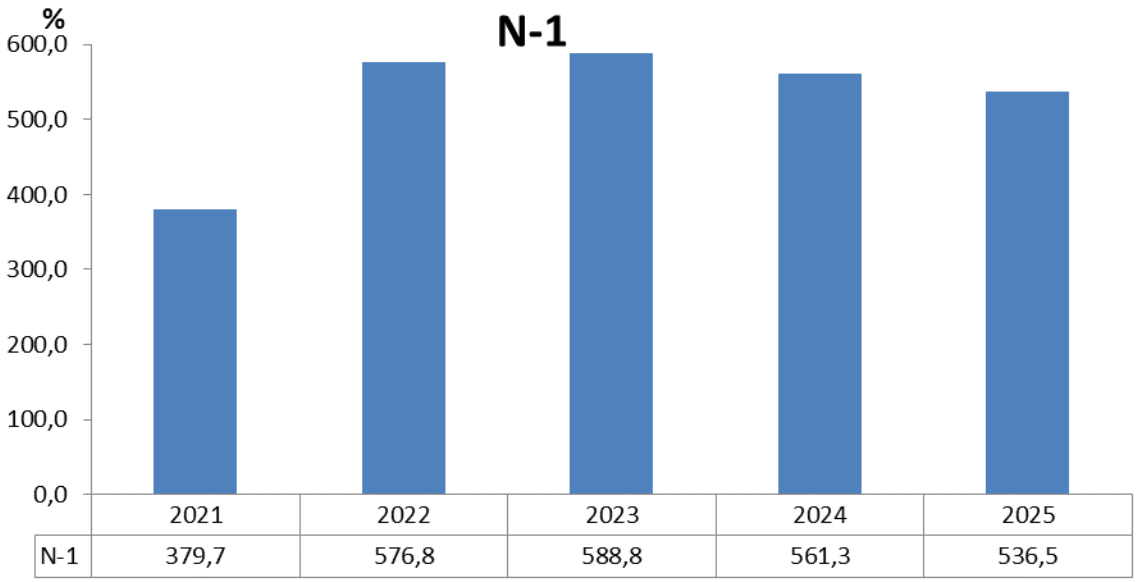
$$N-1(\%) = \frac{\sum_{m=1}^{7} EPm + S\,max + P\,max - I\max}{Dmax}$$

Where:

EP1	Technical capacity at IP Strandzha 2/Malkoclar, taking into account the capacity of the aggregated connection, mcm/d and the consumption in South West Bulgaria
EP2	Technical capacity at IP Negu Voda 2,3/Kardam, taking into account the capacity of the aggregated connection, mcm/d and the consumption in South West Bulgaria
EP3	Technical capacity of GMS Negru Voda 1, mcm/d
EP4	Technical capacity for import through Interconnector Bulgaria-Serbia, mcm/d
EP5	Technical capacity of IP Kulata/Sidirokastro, mcm/d
EP6	Technical capacity of IP Ruse/Giurgiu (IBR), mcm/d
EP7	Technical capacity of the Interconnection Greece-Bulgaria (IGB), mcm/d
EP8	Technical capacity of IP Kireevo/Zaycar, taking into account the capacity of the aggregated connection, mcm/d and the consumption in South West Bulgaria
Smax	Withdrawal from UGS Chiren – the maximum possible
Pmax	National gas production – the maximal possible production
Dmax	National consumption – peak consumption
Imax= EP1	The single largest gas infrastructure – IP Strandzha 2/Malkoclar, mcm/d

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

Year	Pmax	Smax	EP2	EP3	EP4	EP5	EP6	EP7	EP8	Dmax	EP1=Imax	N-1
	mcm/d											%
2021	0,16	4,70	31,00	20,28	0,00	6,13	2,55	0,00	2,00	17,60	31,00	379,7
2022	0.18	5,39	31,00	20,28	0,00	6,13	2,55	9,15	31,00	18,32	31,00	576,8
2023	0.19	6.09	31.00	20,28	5,48	6,13	2,55	9,15	31,00	19,00	31,00	588,8
2024	0.21	6,79	31,00	20,28	5,48	6,13	2,55	9,15	31,00	20,06	31,00	561,3
2025	0.23	7,49	31,00	20,28	5,48	6,13	2,55	9,15	31,00	21,12	31,00	536,5



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 demand on the territory of the Republic of Bulgaria for one day of exceptionally high natural gas demand.

Over the past years Bulgartransgaz EAD realised a significant progress in ensuring the interconnectivity with the gas transmission systems of neighbouring countries, enhancing the transmission capacities and providing the possibility for gas supply to the country through various routes. The Company 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 2021-2030.

The investments provided for the period 2021 - -2030 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 and an opportunity to create a regional gas hub, including spot market by means of:

- Construction of the necessary facilities to connect the existing gas transmission infrastructure with the future trans-European gas corridors and the Southern Gas Corridor projects, which envisage to ensure diversification of natural gas supply sources and the gas transmission routes to Europe;
- Connection of gas production companies in the country to the gas transmission network;
- Development and implementation of electronic systems for operations' control.

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,** which will contribute to improving the 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 (2021- 2030).

- 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 2021 - 2023 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 2021 – 2030 – Table 2;
- Projects for the development of the gas transmission and storage infrastructure in the period 2021-2030 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 2021 - 2023 ON WHICH INVESTMENT DECISION HAS BEEN TAKEN

Investments for the more significant projects of the network for which a decision has been taken and which are scheduled for implementation in the period 2021 - 2023, are presented in consolidated form in Table 1. The implementation of some of the projects has commenced before 2021, but work on them continues during the period 2021 - 2023. 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 1

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2023 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
I. 2021-2023 RECONSTRUCTIONS, REHABILITATIONS AND OVERHAULS		
1. Investments in Compressor stations:		
1.1. Gas transmission network for transit transmission		
CS Ihtiman – educational and practice centre; Monitoring of the state and execution of repair works of roofs and cement site for the technological equipment at CS Provadia, CS Ihtiman and CS Petrich – repair of buildings, transformer station; Reconstruction of local lights at CS Ihtiman and CS Petrich; Repair and supervision of the disassembly and subsequent assembly of 4 Tandem T.28 BD sealings – John Crane EAA; Reconstruction of piping at CS Strandzha	2018-2023	2,529
Modernization of CSs by integrating 4 GTCUs low emission as turbine compressor units (GTCUs) at 3 CSs.	2018-2021	46,650
1.2. National gas transmission network		
Reconstructions and rehabilitations of CS Polski Senovets and CS Valchi dol	2018-2023	6,530
CS Valchi dol – repair of complex distribution switches 6 kV	2018-2021	1,380
2. Investments in existing AGRSs		
2.1. National gas transmission network		
Reconstruction, reorganization and modernization of AGRS, GRS and GMS: AGRS Lovech, AGRS Samokov, GRS	2018-2021	236

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2023 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
Strashimirovo, GRS Pleven		
Modernization and activities for the automatization of GRS and major AGRS overhauls	2020-2023	625
3. Chiren UGS		
Reconstruction and rehabilitation of wells and surface equipment – 3D field seismic studies on the area of Chiren structure; a modernization of wells telemetric system	2018-2022	994
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; replacement of pipes of gas motor compressors closed and open cycle, implementation of "Control of technological parameters system of 4 gas-motor compressor"; implementation of a performance regulation system of 2 gas-motor compressor; servicing at 8,000 motorhours of the performance regulation systems of gas motor compressors 5 and 6;	2016-2022	10,076
4. National gas transmission network		
Overhaul with replacement of the section of the transmission in the section CS Valchi dol – VA Preselka; replacement of the section of the transmission in the section PF Beglezh – VA Dermantsi – VA Batultsi – VA Kalugerovo; Reconstruction of gas pipeline branch Vratsa 1, including replacement of sections and construction of receive chamber at Chiren UGS by displacement of the existing chamber at GRS Vratsa; Increase of the capacity of gas pipeline branch Targovishte; repair of main gas pipeline northern semi-ring by replacing the pipeline sections;	2016-2022	75,139
5. Transit gas pipelines		
Reconstruction of protection equipment, restoration of the soil of the transit gas pipeline to Greece and overhaul of PF Stryama	2018-2022	2,132
Repair of the transit gas pipeline DN 1000 to Southeast Operating Region Stara Zagora by replacement of piping sections	2021-2022	30,000
II. INVESTMENTS IN CONSTRUCTION OF NEW FACILITIES TO THE EXISTING INFRASTRUCTURE NECESSARY TO INCREASE THE EFFICIENCY OF OPERATION		

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2023 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
1. National gas transmission network		
Construction of cleaning facilities (launch-receive chambers) for gas pipeline branches Dimitrovgrad, Burgas, Devnia, Pernik	2018 – 2023	4,205
Expansion of the gas transmission infrastructure of Bulgartransgaz EAD from the Bulgarian-Turkish to the Bulgarian-Serbian border	2018 - 2021	116,554
Connection to Interconnection Greece-Bulgaria (IGB)	2021-2021	8,160
Gas pipeline from Chiren UGS to VA Chiren - Butan of the Balkan Stream gas pipeline – development of investment design	2021-2021	960
AGRS Dermantsi – for gas pipeline branch Lukovit, VA Dermantsi	2021-2022	1,550
2. Natural gas storage		
Integrated software platform for reservoir modelling and simulation of Chiren underground reservoir operations and the implementation thereof with the relevant hardware; Design and construction of a system separating formation fluids and the blown gas as a result of the wells gas gathering drainage and the remaining technological equipment of Chiren UGS; Expansion of the capacity of Chiren UGS – surface equipment – development of investment design	2018 – 2022	6,080
3. Investments in auxiliary networks		
Implementation of an IT platform for commercial dispatching; new outside power supply and Switchgear for the administrative building of the main offices;	2018-2023	7,479
LNG terminal near Alexandroupolis	2020-2022	32,466
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		
Construction of new gas transmission pipelines with AGRS to Svishtov, Panagyurishte and Pirdop and Bansko and Razlog	2018-2024	70,150
2. Investments for construction of new gas metering and gas regulation stations		
Construction of new GMSs and AGRSs - VA and AGRS	2018-2024	1,371

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2023 by consolidated projects	Implementation schedule	Estimated amount of investment in thousand BGN (w/o VAT)
Ignatievo; purchase of existing assets to develop the gas market		

2. INVESTMENTS IN THE DEVELOPMENT OF NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEPENDING ON THE DEVELOPMENT OF INTERNATIONAL PROJECTS AND THIRD PARTIES PROJECTS IN THE PERIOD 2021-2030

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

Table 2

Investments in natural gas transmission and storage infrastructure in the period 2021 – 2030 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)	2019-2022	152,650[3]

The financial resources under items 1 and 2 of Table 2 represent the funding that is envisaged to be secured by Bulgartransgaz EAD.

3. NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEVELOPMENT PROJECTS IN THE PERIOD 2021 - 2030 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 3

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2030 for which no investment decision has been taken	Forecast implementation period	Estimated amount of investment in thousand BGN (w/o VAT)

[3] The amount of the investment is determined based on studies and analysis made by Bulgartransgaz EAD linked with the preparatory actions to attract financing from Operational Programme "Innovations and Competitiveness" and Connecting Europe Facility and it reflects the value of the already signed contracts.

Natural gas transmission and storage infrastructure development projects in the period 2021 - 2030 for which no investment decision has been taken	Forecast implementation period	Estimated amount of investment in thousand BGN (w/o VAT)
1. Gas transmission network for natural gas trans-border transmission		
1.1. Retrofitting the fuel systems of 6 GTUs type THM 1304/11 with low-emission combustion chambers	2019 - 2024	30,000
1.2. Construction of a reverse flow connection line at CS Provadia	2020-2021	2,000
1.3. Construction of a reverse flow connection line at CS Ihtiman	2020-2022	1,700
2. National gas transmission network		
2.1. Actions on construction of cleaning facilities /launch and receive chambers/ of gas pipeline branches for Pleven and Pazardzhik	2018-2023	2,010
2.2. Infrastructure suitable for transport of hydrogen and low-carbon gaseous fuels in coal regions in the Republic of Bulgaria	2020-2024	42,949
3. Natural gas storage		
3.1. Expansion of Chiren UGS capacity[4]	2020 - 2025	603,071

The funds under items 1.1. and 2.1 of Table 3 represent Bulgartransgaz EAD forecast value of the required financing. The funds indicated in item 2.2. represent the forecast amount of Bulgartransgaz EAD investment. The funds under item 3.1. represent the forecast value of costs for the design, construction, construction supervision and cushion gas.

Concerning PCI under item 3.1. – Chiren UGS capacity expansion, the table shows the funds that Bulgartransgaz EAD may provide for the realisation of the project in the period 2022-2024. The project's total estimated value is about EUR 308 million, whereas different forms and means of financing, including EU's financial instruments and programmes will be sought.

[4] Project of common interest in the meaning of regulation (EU) 347/2013, included under number 6.20.2 in the fourth list of Projects of Common Interest (PCI).

4. 2021 – 2030 INVESTMENT PROGRAMME

This Section presents Bulgartransgaz EAD Investment Programme for the period 2021-2030 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 (2021-2023) including investment activities for which final investment decision has been taken

in BGN thousand, VAT excluded

Programme/Section	Total 2021	Total 2022	Total 2023
TOTAL Annual Investment Programme:	**1,489,665**	**1,014,027**	**58,977**
SECTION I.1 - Construction of new facilities	*1,055,966*	*38,035*	*38,922*
Gas transmission network for transit transmission	*2,787*	*1,547*	*645*
Pipeline network	64	64	0
Compressor stations, administrative and operating regions	0	303	645
Communication and information systems	2,724	1,181	0
National gas transmission network	*1,028,099*	*15,202*	*17,016*
Pipeline network	1,027,230	13,944	15,795
Compressor stations, administrative and operating regions	0	138	601
Communication and information systems	678	500	0
AGRS and GMS	191	620	620
Natural gas storage	*4,480*	*1,200*	*400*
Wells and gas gatherings	480	0	0
Main technological installations and systems, operating unit	0	200	400
Expansion of Chiren UGS capacity	4,000	1,000	0
Total for distribution by types of activities	*20,600*	*20,085*	*20,860*
Pipeline network	*16,233*	*16,233*	*0*
Compressor stations, administrative and operating regions	614	2,020	19,930
Communication and information systems	3,753	1,832	930
SSECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets	*118,637*	*65,752*	*12,232*
Gas transmission network for transit transmission	*56,716*	*29,543*	*7,492*

Pipeline network	10,036	22,225	0
Compressor stations, administrative and operating regions	46,650	7,318	7,492
Communication and information systems	30	0	0
National gas transmission network	*53,233*	*28,530*	*3,430*
Pipeline network	50,557	25,123	0
Compressor stations, administrative and operating regions	2,390	3,007	2,905
AGRS and GMS	286	400	525
Natural gas storage	*7,939*	*3,476*	*0*
Wells and gas gatherings	294	700	0
Main technological installations and systems, operating unit	7,646	2,776	0
Total for distribution by types of activities	*749*	*4,203*	*1,310*
Pipeline network	587	3,419	0
Compressor stations, administrative and operating regions	161	784	1,310
SECTION I.3 - Supply of machinery and equipment	*8,776*	*8,860*	*7,500*

BULGARTRANSGAZ

4.2. 2024-2030 Investment programme, including mandatory investment activities ensuring capacity capabilities of the networks, in BGN thousand, VAT excluded

in BGN thousand, VAT excluded

Programme/Section	Total 2024	Total 2025	Total 2026	Total 2027	Total 2028	Total 2029	Total 2030
TOTAL Annual Investment Programme:	56,830	53,888	56,582	59,412	62,382	65,501	68,776
SECTION I.1 - Construction of new facilities	29,843	28,351	29,769	31,257	32,820	34,461	36,184
Gas transmission network for transit transmission	4,013	3,812	4,003	4,203	4,413	4,634	4,865
National gas transmission network	10,830	10,289	10,803	11,344	11,911	12,506	13,132
Natural gas storage	12,500	11.875	12,469	13,092	13,747	14,434	15,156
Total for distribution by types of activities	2,500	2,375	2,494	2,618	2,749	2,887	3,031
SSECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets	18,987	18,037	18,939	19,886	20,880	21,924	23,020
Gas transmission network for transit transmission	11,200	10,640	11,172	11,731	12,317	12.933	13,580
National gas transmission network	4,692	4,457	4,680	4,914	5,160	5,418	5,688
Natural gas storage	953	905	950	998	1,048	1,100	1,155
Total for distribution by types of activities	2.142	2,035	2,137	2,244	2,356	2,474	2,597
SECTION I.3 -Delivery of machinery and equipment	8,000	7,500	7,875	8,269	8,682	9,116	9,572

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. An important place in the European energy policy is also occupied by the strategic goals for improving the security of supply, diversification of sources and routes of natural gas supply and achieving decarbonisation of the energy sector.

The following projects, which are part of the Gas Hub Balkan Concept, will be key for the market integration and enabling the transport of additional natural gas quantities to and through Bulgaria:

- The project for expansion of the gas transmission infrastructure from the Bulgarian-Turkish to the Bulgarian-Serbian border;
- the interconnections with Greece and Serbia;
- Expansion of Chiren UGS capacity;
- The LNG terminal near Alexandroupolis.

The capacity expansion of the Chiren UGS; the modernization of Bulgartransgaz EAD infrastructure; the Alexandroupolis LNG terminal and the Interconnections with Serbia and Greece are projects of common interest for the EU (PCI) as per Regulation (EU) 347/2013. The implementation of these projects is interrelated and will contribute to the realization of the Concept for a Gas Hub in Bulgaria, as well as the development of the single European gas network.

5.1. Development of the gas infrastructure regarding the concept for the construction of a regional gas hub in Bulgaria – Balkan gas hub

The gas hub concept is based on several key elements which together form the project:

- New natural gas sources;
- Optimal use of the existing gas transmission networks and Chiren UGS;
- - Modernization and expansion of the existing infrastructure;
- Construction of new interconnections with the neighbouring countries;
- New infrastructure for the gas hub;
- Creation of optimal trade environment through a liquid gas exchange.

By constructing the necessary infrastructure and securing the trading and regulatory environment, the markets in the Balkan region and Central and Eastern Europe will be connected with the markets in Western Europe.

Balkan Gas Hub is included in the fourth list of projects of common interest of the EU as 6.8 Cluster of infrastructure development and enhancement enabling the Balkan Gas Hub. In this cluster are included the projects for interconnections with Greece and Serbia, as well as the project for modernization and rehabilitation of the gas transmission system of Bulgartransgaz EAD.

In 2019 Bulgartransgaz EAD registered its own company Balkan Gas Hub EAD, which undertook actions for creating an organized exchange market with various trade segments

and for the adoption of the necessary legislation amendments for providing a trade and regulatory environment. In January 2020 multilateral trade on the organized exchange market started on the platform of Balkan Gas Hub EAD, including a short-term (spot) segment, long-term segment and brokering service.

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 expansion of Bulgartransgaz EAD gas transmission infrastructure from the Bulgarian-Turkish to the Bulgarian-Serbian border achieved the security of supply of natural gas for Bulgaria and the neighbouring countries. The project contributes to creating real conditions to increase the competition, diversify the sources and routes and enabling the transmission of additional natural gas quantities to and through Bulgaria. The new infrastructure contributes considerably for the strengthening of the role of the Republic of Bulgaria as a leading trade distribution centre in the region and EU as a whole.

The realisation of the Bulgaria - Serbia interconnection will achieve diversification of the routes, interconnection and natural gas transmission to Serbia using the planned new entry points with Turkey and Greece. At the same time, in case of a crisis it could be used for natural gas supply from Serbia.

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 between the countries in Europe. 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 - an objective for the realisation of which by the countries form East Europe natural gas will play a key role.

The interconnection Greece - Bulgaria provides an additional connection for the systems of Bulgartransgaz EAD and DESFA S.A. and access to the liquefied natural gas terminal near Alexandroupolis and the TAP gas pipeline.

The IGB realisation is linked with the policy of the Republic of Bulgaria targeted at securing an infrastructure for the access to alternative sources and natural gas import routes.

The construction of the gas pipeline will enable Bulgaria and Greece to respond efficiently in cases of possible cuts in the supply from external sources or seasonal peaks in consumption on natural gas - an infrastructure will be in place to cover the crisis supply and satisfy peak consumption in the month of big consumption.

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

Through the exisitng and envisaged gas pipelines in the region, natural gas form the terminal will be delivered to consumers in Bulgaria, as well as Northern Macedonia, Serbia, Turkey, Romania, Hungary, Moldova and Ukraine, providing them with the opportunity to benefit from the booming LNG market and the advantages it offers - flexibility, competitiveness and security of supply, as well as access to new suppliers.

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

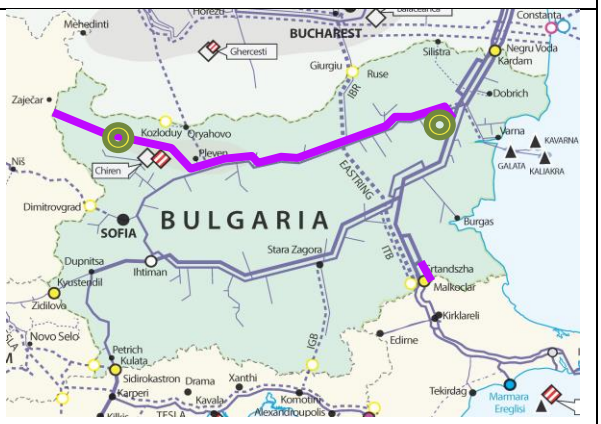
development of the gas infrastructure and the realisation of the concept of a Bulgarian gas distribution centre (Balkan Gas Hub) determine the role of Chiren UGS as a commercial storage facility. Providing additional storage volume will promote natural gas trade, increase market competition and contribute to the functioning of the liquid gas market. The expansion of Chiren UGS is in synergy as well with the project for LNG terminal near Alexandroupolis.

Expansion of the gas transmission network of Bulgartransgaz EAD in the section from the Bulgarian-Turkish to the Bulgarian-Serbian border

Identification of the project in lists:
Project code in ENTSOG Union-wide Ten-Year Network Development Plan for gas **-** TRA-F-592;
A project of national significance in accordance with Decision 312/10.05.2018

Type of the project: A gas pipeline, compressor stations, gas metering station, etc

Description of the Project The project includes the construction of a gas transmission pipeline from the Bulgarian-Turkish to the Bulgarian-Serbian border, optic cable line, two compressor stations, gas metering station Strandzha and other auxiliary technological equipment.
Technical data:
Length (in km): A total of 48.48 km
Pipeline diameter: DN1200
Technological sites:
- 2 compressor stations;
- Gas metering station;
- pigging facilities of the gas pipeline
- valve groups, etc.



Expected amount of the investment: ~EUR 2.767 million

Expected commissioning date:	In stages, by 01.10.2021
Project phase	Under construction

Current status of project implementation:
Constructed and commissioned **in 2019** are:
- a gas transmission pipeline with a length of 10.73 km form the Bulgarian-Turkish border to GMS Strandzha;

Constructed and commissioned **in 2020** are:
- Pipeline network part, representing a gas pipeline with a length of 474 km and a diameter of 1200mm from the village of Zlatitsa, Provadia municipality to the Bulgarian-Serbian border;
- Compressor Station Rasovo

Under construction
- Compressor Station Nova Provadia

Expected benefits
Security of natural gas supplies to Bulgaria;
Security of natural gas supplies to the neighbouring Balkan countries and the region;
Diversification of natural gas supply sources and routes;

BULGARTRANSGAZ

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

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

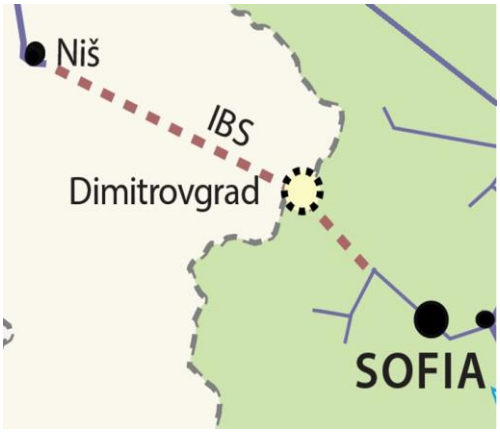
OPERATIONAL PROGRAMME INNOVATIONS AND COMPETITIVENESS

Co-financed by the Connecting Europe Facility of 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:
Length (in km): A total of 170 km; 62 km of which on Bulgarian territory.
Pipeline diameter: DN700
Capacity: capacity of ~ 1.8 bcm with a possibility as well for reverse flow.
Technological sites: Gas metering station, 2 automatic gas distribution stations and gas pipeline branches, cleaning facilities, valve groups
Start date: the region of the town of Novi Iskar, Republic of Bulgaria to
End: Bulgarian-Serbian border.



Expected amount of the investment: ~ EUR 81 million, VAT excluded.	**Funding:** 1. Bulgartransgaz EAD own funds 2. Co-financing from Operational Programme Innovation and Competitiveness 2014-2020 (OPIC) up to EUR 2.8 million for preparatory activities; 3. Co-financing from the Connecting Europe Facility (CEF) amounting to EUR 27.603 million Action 6.8.3-0013-BG-W-M-18)
Expected commissioning date:	2022
Project phase	Design and issuance of permits for the project

Current status of project implementation:
- Conduct of environmental protection procedures;
- Preparation of an investment design in the Technical design phase;
- Public procurement for the selection of a contractor for the activities linked with the Detail Design, procurement of materials and equipment, construction and commissioning of the site.

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.bulgartransgaz.bg/ibs

BULGARTRANSGAZ

Interconnection Bulgaria-Greece (IGB), PCI 6.8.1

Identification of the project in lists:
PCI 6.8.1 Interconnection Bulgaria -Greece (IGB)
CESEC priority project
A project of national significance in accordance with Decision 615 of 14.07.2009 of the Council of Ministers of the Republic of Bulgaria.

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 Hellenic Republic.

Technical data:
Length (in km): A total of 182 km; 151 km of which on Bulgarian territory.
Pipeline diameter: DN800
Capacity: capacity ~ 3 bcm/y with an opportunity for increase up to 5 bcm/y with the construction of a compressor station
Technological sites: GMS, AGRS, PF
Start date: the region of the town of Stara Zagora, the Republic of Bulgaria
End: Komotini, the Hellenic Republic.

Expected commissioning date:	2021
PROJECT PHASES	Under construction

The project shall be realised by a joint investment company ICGB AD with shareholders Bulgarian Energy Holding EAD (50%) and the Greek investment company IGI Poseidon (50%).

Project website: https://www.icgb.eu/home

The Alexandroupolis Independent Natural Gas System (INGS), PCI 6.9.1

Identification of the project in lists:
PCI 6.9.1 Liquefied natural gas terminal in Northern Greece (LNG terminal in Northern Greece)
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 interconnection Bulgaria–Greece currently under construction.

Technical data:
Floating terminal for reception, storage and re-gasification of LNG
Design capacity of regasification and supply to the Greek gas transmission system: 6.1 bcm/y
Design storage capacity 170 thousand m³ of liquefied natural gas.

Expected commissioning date:	2024
Project phase	Design and issuance of permits for the project

Current status of project implementation:
- March 2020 - the end of the binding market phase of capacity booking market study;
- January 2021 - a call for tender for engineering, procurement and construction of a permanent mooring system of Alexandroupolis Independent Natural Gas System.

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;

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/

Expansion of Chiren UGS capacity (PCI 6.20.2)

Co-financed by the Connecting Europe Facility of the European Union

Identification of the project in lists:
PCI 6.20.2 Chiren UGS Expansion
Part of Cluster increase storage capacity in South-East Europe

Type of the project: Chiren Underground Gas Storage

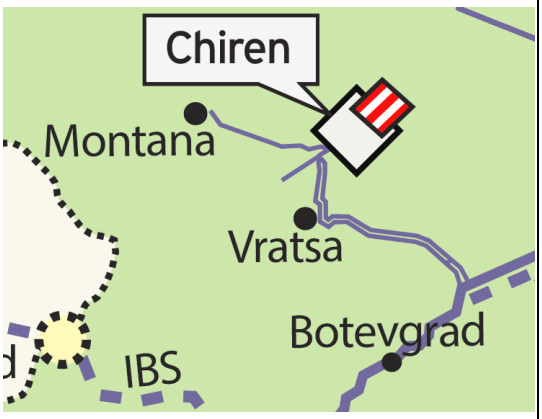
Description of the Project: Chiren UGS expansion - increase in the active gas to 1 bcm and increase in the injection and withdrawal capacity to 8-10 mcm/d.

Technical data:

- Surface equipment: CS with auxiliary equipment, GMS, separation installations, heating and dehydration, etc.

- Wells: 10 exploitation and 3 monitoring wells, wells repair, liquidation of wells, gatherings, etc.

- Gas pipeline from VA Butan to Chiren UGS with a length of 45 km and DN700.



Expected amount of the investment: ~ EUR 308 million, VAT excluded.	**Funding:** 1. Bulgartransgaz EAD own funds; 2. Co-financing by the Connecting Europe Facility (pending application)
Expected commissioning date:	2024
Project phase	Design and issuance of permits

Current status of project implementation:
- January 2021 - a public procurement was announced for the design of the surface equipment.
- March 2021 - Completion of the 3D seismic studies on the area of the Chiren structure (close to 200 sq. m), co-funded by the Connecting Europe Facility amounting up to EUR 3.9 million (Action 6.20.2-0021-BG-S-M-15);
- Consultations are underway with neighbouring transmission system operators in accordance with Regulation No. 347/2013;

**Detailed information on the progress of the individual parts of the new infrastructure for the project is given in item 5.5.2.*

Expected benefits
Guaranteeing the security of supply;
Enhancing the market integration;
Boosting the market competition;
Encouraging gas trade in the region.

Project website: https://www.bulgartransgaz.bg/chiren

BULGARTRANSGAZ

Rehabilitation, modernization and expansion of the Bulgarian transmission system - Phase 2, PCI 6.8.2

Co-financed by the Connecting Europe Facility of the European Union

Identification of the project in lists:
PCI 6.8.2. Rehabilitation, modernization and expansion of the Bulgarian transmission system CESEC priority project
A project of national significance in accordance with Decision 312 from 10.02.2018 of the Council of Ministers

Type of the project: Rehabilitation and modernisation of the gas transmission system on the territory of Bulgaria

Technical data (Phase 2):
Stage 2 of compressor stations modernization
Integration of 4 new gas turbine compressor units (GTCUs) in 3 CSs;
CS Lozenets – 2 units; (GTCU)
CS Petrich – 1 unit; (GTCU)
CS Ihtiman – 1 unit. (GTCU)
Rehabilitation (replacement) of sections with a total length of 81 km:
Section 1: PF Beglezh – VA Dermantsi – VA Batultsi – VA Kalugerovo with a length of 58 km and DN700
Section 2: PF Valchi Dol – LVA Preselka with a length of 23 km and DN700

Expected amount of the investment: ~ EUR 340 million, VAT excluded.	**Funding:** Stage 2 of modernisation of 3 CSs - Bulgartransgaz EAD own funds. Rehabilitation (replacement) of 81 km of sections: 1. Bulgartransgaz EAD own funds 2. Co-financing from the Connecting Europe Facility (CEF) amounting up to EUR 27.184 million (Action 6.8.2-0034-BG-W-M-18).
Expected commissioning date:	2022
Project phase	Execution of construction works

Current status of the compressor stations modernization
Issued building permits, execution of construction and installation works.
Commissioned construction site "Reconstruction of CS Pertich with the construction of one new GTCU" in February 2021.
Current staus of implementation of sections with a total length of 81 km:
Section of ~ 13 km - run into operation in 01/2021
Section of ~ 25 km - completed construction activities in 11/2020
Section of ~ 19 km and a pigging facility - construction started in 11/2020
Section of ~ 25 km – Selected contractor, issued building permit in February 2021
**Detailed information on the progress is available in items 5.4.1.1., 5.4.1.2 and 5.4.1.3.*

Expected benefits
Providing the required capacities and reliable natural gas transport
Improving the efficiency, reliability and flexibility of the transmission system
Ensuring the technical possibilities for transmission of additional natural gas quantities through the territory of the country entering from existing and new entry/exit points
Possibilities to diversify the transmission directions depending on market interest

Project website: https://www.bulgartransgaz.bg/rehabilitaciya

5.2. Other projects for development of Bulgartransgaz EAD infrastructure in early stage of development

5.2.1. Eastring – Bulgaria

Eastring is a sub-project of the Eastring project, envisaging the construction of a transport corridor through the territories of Slovakia, Hungary, Romania and Bulgaria, providing an opportunity for bi-directional natural gas supplies from alternatives sources. The corridor is envisaged to be realized between IP Velké Kapušany/Veké Zlievce on the territory of Slovakia and an IP with an external EU border on the territory of Bulgaria. Bulgartransgaz EAD is the company that is involved in the realization of the Bulgarian section of the Eastring.

In accordance with the outcome of the feasibility study (completed in 2018 and co-financed by CEF), on the territory of the Republic of Bulgaria[5], if the economic feasibility and effectiveness of the project is evidenced, a new gas pipeline DN 1400 with an approximate length of 262 km from a new entry-exit point on the Bulgarian-Romanian border to a new entry-exit point to an external EU border on the territory of Republic of Bulgaria. One new compressor station and one new gas metering station are expected to be constructed.

To realize the project Bulgartransgaz EAD and Eustream signed in June 2016 a Memorandum of Understanding, stating that the two Parties will cooperate and analyse the prospects for development of the gas markets to identify the expected demand for capacity of the Eastring gas pipeline. In July 2016, a MoU on the Eastring project was signed in Bratislava between the Bulgarian Ministry of Energy and the Slovak Ministry of Economy. The document expresses both parties' support for the project in line with the EU legislation.

In 2019, the Eastring project was not supported by the EC and was withdrawn from the list of projects of common interest for the EU, and so far, there is no progress in the development of the project.

5.2.2. 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.

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
- Memorandum between Bulgartransgaz EAD and the Macedonian Energy Resources joint stock company for the performance of energy activities for a feasibility study for the construction of a new gas interconnection between the Republic of Bulgaria and the Republic of North Macedonia.

One of the options to be assessed is construction of the interconnection along the route Petrich-Strumitsa.

[5] The project of Bulgartransgaz EAD represents an entirely new infrastructure on the territory of Bulgaria. The capacity of the gas pipeline is completely new and does not affect the capacity of concluded long-term contracts for cross-border transmission.

5.2.3. Opportunities for new gas storages in Bulgaria

To ensure the security of supply and encourage the gas market liberalization a study of the possibilities for new gas storage facility in Bulgaria is planned. The development of the regional gas infrastructure, including the Southern Gas Corridor projects, the planned gas interconnections and other major cross-border gas projects, determine the need in the long term of providing additional storage capacity and thus justify the implementation of new gas storage facility projects.

Together with the Chiren gas storage facility in operation, a new one could serve not only the national, but also the regional gas market after the planned construction of the new interconnections with neighbouring countries. It could be constructed in suitable geological structure – depleted gas fields (onshore or offshore), salt caverns or aquifer. It should be considered that the construction of a new underground gas storage from the start of the geological and research activities to its commissioning would take a considerable period of time.

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

The development of the existing network is an essential process in terms of creating opportunities for sustainable economic environment favouring the development of Bulgarian economy. Besides supporting the economy, the implementation of such projects is directly related to the development of the respective regions - in business and social aspect. The projects envisaged would increase the number of Bulgarian households with access to natural gas, would accelerate the process of gasification in the country and the improvement of energy efficiency. Moreover, temporary jobs will be provided in the process of their construction. In general, their implementation is associated with significant environmental effect - reducing harmful emissions from burning solid and liquid fuels.

5.3.1. Projects in progress

- **Gas pipeline branch Razlog - Bansko**

The gas pipeline design length is about 37 km, maximum flow rate 30,000 m^3/h and diameter DN 250 and working pressure of PN 54 bar. The route of the gas pipeline is expected to run on the north slopes of the Pirin mountain, continuing on the south slopes of the Rila mountain and reaching AGRS Razlog-Bansko, located in the lands belonging to the town of Razlog near the border with the lands belonging to the town of Bansko.

The project is funded by a grant under Kozloduy International Decommissioning Fund to the amount of EUR 195.5 thousand. Co-funding by Bulgartransgaz EAD is to the amount of EUR 14.767 million and a further EUR 0.94 million will be invested for state fees, the easement, compensations, archaeological surveys, consultancy services under Art. 166 of the SDA, etc.

A contract has been signed for the preparation of a technical and detailed design, detailed spatial plan (DSP) and EIA, which is under implementation. An EIA Decision has been issued. Approved and enforced Detailed Spatial Plan - Parcelling Plan; The investment design has been prepared - phase Technical Design currently under coordination with the control bodies. The planned deadline for completion of the project is the end of 2023.

- **Gas pipeline branch Panagiurishte - Pirdop**

The gas pipeline length is planned to be about 62 km, maximum capacity 25,000 m^3/h and 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 Pirdop.

The project is funded by a grant under Kozloduy International Decommissioning Fund to the amount of EUR 6.834 million. Co-financing on behalf of Bulgartransgaz EAD is to the amount of EUR 12.888 million and another EUR 1.76 million will be invested to pay the state fees, the easement, compensations, etc.

A Feasibility study has been carried out. The procedure in line with the rules of the EBRD on selection of a designer to prepare the technical and the detailed design, Detailed Spatial Plan (DSP) and EIA was completed and a contract for providing consultancy services for the design was signed and is being executed. The technical and Detailed design have been prepared by the designer and approved by all institutions according to the Bulgarian legislation; the building permit to be issued by the MRDPW is pending.

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://ecepp.ebrd.com/. A contract has been signed and implemented – the main materials and equipment for the project have been delivered and stored at Bulgartransgaz EAD warehouse.

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 chosen and contract has been signed, whose implementation has started.

The planned deadline for completion of the project is the end of 2021.

- **Gas pipeline branch to the town of Svishtov**

The gas pipeline expected length is 42 km, diameter DN 200 and operating pressure PN 54 bar. Power supply will be provided from Valve Assembly Patresh, located on the north ring of the main gas pipeline to AGRS, which will be located to the south of the town of Svishtov.

The project is funded by a grant under Kozloduy International Decommissioning Fund to the amount of EUR 3.770 million. Co-funding by Bulgartransgaz EAD is to the amount of EUR 8.266 million and a further EUR 0.54 million will be invested for state fees, the easement, compensations, archaeological surveys, consultancy services under Art. 166 of the SDA, etc.

A Feasibility study has been carried out. A designer to prepare the technical and the detailed design, Detailed Spatial Plan (DSP) and EIA (if needed) has been selected and the contract is being executed. The Technical and Detailed Designs have been prepared by the designer and approved by all institutions according to the Bulgarian legislation; the building permit has been issued by the MRDPW. Designer's supervision during construction is the only activity to be carried out.

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://ecepp.ebrd.com/. A contract has been signed and implemented – the main materials and equipment for the project have been delivered and stored at Bulgartransgaz EAD warehouse.

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 chosen and contract has been signed, whose implementation has started.

The planned deadline for completion of the project is the end of 2021.

5.3.2. Possibilities for construction of new gas pipeline branches

- **Gas pipeline branch with AGRS Graf Ignatievo to towns of Hisarya – Banya**

– Karlovo - Sopot

The gas pipeline branch is expected to be about 54 km supplied by the existing main gas pipeline, the Southern semi-ring, between the road Plovdiv – the village Stroevo – Malak Chardak – Golyam Chardak and the gas pipeline branch to Plovdiv, located at about 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.

Currently exploratory activities to determine the scope, manner of execution, financing and taking a final investment decision are envisaged.

- **Transmission gas pipeline to Kozloduy and Oriahovo**

The project includes the construction of a gas pipeline high pressure to Kozloduy with a diameter of DN 350 and Oryahovo with a diameter of DN 150 and two AGRSs.

Bulgartransgaz EAD is ready to assist in realising all motivated and economically beneficial projects, which if well-motivated will be included in the Pre-Investment or the Investment Programme at the next update thereof.

5.3.3. Possibilities for the construction of an infrastructure suitable for transport of hydrogen and low-carbon gaseous fuels

The National Recovery and Resilience Plan of the Republic of Bulgaria provides for a possibility for the construction of an infrastructure suitable for the transport of natural gas, hydrogen and other low-carbon gaseous fuels and their mixtures in the region of the eastern Maritsa coal basin and Bobov Dol. The project aims at creating an opportunity for gradual phasing-out of coal and replacement at stages of the fuel base in the country's coal regions by use of alternative environmentally friendly energy sources such as hydrogen. It is envisaged that until establishment of sufficient production capacity for hydrogen, the gas pipeline infrastructure to be used for transport of low-carbon gaseous fuels and their mixtures in various ratios (hydrogen, biogas, natural gas). The new infrastructure with a total length of about 175 km will be part of Bulgartransgaz EAD gas transmission infrastructure.

The project comprises a set of activities for provision of new supply gas pipeline infrastructure, as follows:

- Subproject 1: Design, construction and commissioning of infrastructure suitable for transport of hydrogen and low-carbon gaseous fuels for supply of consumers in the Eastern Maritsa cola basin, including, but not limited to TPP Maritsa East - 2, ContourGlobal Maritsa East 3, AES - 3C Maritsa East 1 and other consumers - gas pipelines of about 125 km total length.
- Sub-project 2: Design, construction and commissioning of infrastructure suitable for transport of hydrogen and low-carbon gaseous fuels for supply of consumers in the region of Bobov Dol, including, but not limited to TTP Bobov Dol, and other consumers - gas pipelines of about 50 km total length

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

5.4.1 Modernization, rehabilitation and expansion of the Bulgarian gas transmission system, PCI 6.8.2

PCI 6.8.2 is a complex project for the modernization, rehabilitation, and expansion of the existing gas transmission infrastructure on the territory of Bulgaria that is implemented in three time phases and includes the following types of activities:

- Modernization and rehabilitation of compressor stations;
- Inspections to determine and characterize the gas pipelines' condition;
- Repair and replacement of gas pipeline sections following inspections;
- Expansion and modernization of the existing network;
- Implementation of systems for the optimization of the management process of the network technical condition.

The activities of Phase 1 have been completed in 2018, whilst the activities of Phase 3 represent a conditional infrastructure, since they are linked with the future final investment decision on the realisation the project Interconnection Bulgaria-Serbia (IBS) and relate to a capacity increase of 1.8 to 2.4 bcm/y. The conditional infrastructure includes a gas pipeline Gorni Bogorov – Novi Iskar with approximate length of 19 km, DN 700 and CS Bogorov – 20 MW.

Currently the activities of Phae 2 of the project are underway:

- - Phase 2 of the modernization of compressor stations by means of integrating 4 GTCUs in 3 compressor stations (CS Lozenets, CS Ihtiman, CS Petrich);
- Rehabilitation and replacement of sections part of the Northern semi-ring of the gas transmission network with a total length of 81 km.

The rehabilitation of the sections (procurement, works and commissioning is implemented with co-financing under the Connecting Europe Facility (CEF) in the tune of close to EUR 27 million and is expected to end in mid-2022.

Detailed information on the individual sites of Phase 2 is given in items 5.4.1.1., 5.4.1.2. and 5.4.1.3. below.

5.4.1.1. Replacement of gas pipeline section "PF Beglezh – VA Dermantsi – VA Batultsi – VA Kalugerovo" (Part of Phase 2 of PCI 6.8.2)

The replacement of the gas pipeline section "PF Beglezh – VA Dermantsi – VA Batultsi – VA Kalugerovo", of 58 km length and diameter DN 700, commissioned in two stages in 1973 and 1975 relates to features found as a result of in-line inspections and a limitation imposed within the maximum allowable operating pressure of 44 bar compared to the design pressure of 54 bar. The realisation of the project will guarantee the reliability of the operation and ensure the natural gas transport capacity.

In April 2016, a public procurement for the selection of a contractor for the design activities has been announced. On 14/10/2016, a contract was concluded with subject: Preparatory works related to the rehabilitation (reinforcement) of the Northern semi-ring of the gas transmission network including pre-investment studies and an investment study for building site "Replacement of a transmission (main) gas pipeline in the section PF Beglezh - VS Dermantsi - VS Batultsi - VS Kalugerovo".

The scope of the contract includes carrying out of an environmental impact assessment (option) in case the competent authority requires it. According to Decision No. 3-PR/2017 of 10.10.2017 of the Minister of Environment and Water, an EIA should be carried out for the site.

EIA Report has been prepared and a Decision No. 3-3/2018 of the Minister of Environment a Water has been issued which approves the realisation of the investment intention. A Detailed Spatial Plan - Parcelling Plan and investment design - Phase Working Design for the section have been developed and approved by the competent bodies according to the SDA.

All activities from the contractual subject-matter, except for the exercise of the designer's supervision during construction, have been completed in 2020. As a result, five building permits have been issued, as follows: For Stage 2– Gas transmission pipeline from VA Batultsi to VA Kalugerovo – pipeline network part; For Stage 2 – transmission gas pipeline from Dermantis to VA Batultsi; For Stage 4 – PF Beglezh; For Stage 1 – gas transmission pipeline from PF Beglezh to VA Dermantsi and for Stage 3 – gas pipeline from VA Batultsi to VA Kalugerovo – valve assemblies.

In 2018, a procedure under the PPA was held and a contract for the construction of a gas transmission pipeline in the section VA Batultsi - VA Kalugerovo was signed. The works for the pipeline network part and the valve assemblies was terminated and a permit to use was issued No.CT-05-35/20.01.2021 by Directorate for National Construction Supervision (DNCS). In the beginning of February 2019, a procedure under PPA was announced for a Constructor for the section VA Beglezh- VA Batultsi and PF Beglezh. After the open public procurement procedure, a contract for the constructor of the section PF Beglezh - VA Batultsi and PF Beglezh was signed. The works for Stage 2 ended in the period May - November 2020 and a statement establishing the appropriateness to accept the building site has been signed (act template 15). The implementation of Stages 1 and 4 started on 17.11.2020 and 19.11.2020 accordingly with the signing of Protocols-Template 2a and is currently ongoing.

To comply with the legal requirements linked to the issuance of building permits d construction of the building sites, three contracts were signed: for the preparation of complex reports on the assessment of the compliance of the investments designs with the material requirements towards building sites for each stage; for the exercise of construction supervision during the woks for the section VA Batultsi to VA Kalugerovo and for the exercise of construction supervision during construction for the section PF Beglezh to VA Batultsi and PF Beglezh.

5.4.1.2. Replacement of gas pipeline section "PF Valchi dol – VA Preselka" (Part of Phase 2 of PCI 6.8.2)

The section of the gas transmission pipeline PF Valchi dol – VA Preselka is part of the Northern semi-ring of the national gas transmission network (NGTN), commissioned in 1975. The section is of approximate length of 23.3 km, outside diameter DN700, built of steel pipes DN 711. The section is the first one downstream CS Valchi Dol on the Northern semi-ring of the NGTN and is subject to increased thermal load. Considering the established defects as a result of in-line inspections and in order to ensure the reliability of operation, the necessary capacity for natural gas transmission and the long-term integrity of the section, it is necessary to replace it.

In May 2017, a public procurement for selection of a Contractor for the design activities was announced. On 15/12/2017, a contract was concluded with subject: "Study and investment design for construction site "Replacement of a transmission (main) gas pipeline in the section PF Valchi Dol - VA Preselka" to a Project of common interest 6.8.2". The activities from the contractual subject-matter, except for the exercise of the designer's supervision

during the construction, have been completed. As a result of the implementation of the contract, a detailed development plan was prepared - a parcel plan (PUP-PP) for the section, approved by an order of the Deputy Minister of Regional Development and Public Works, and an investment design, working phase, agreed by all interested parties. In February 2021, the investment project was filed in the Ministry of Regional Development and Public Works for approval and a building permit was issued.

In December 2019, a procedure was announced under the Public Procurement Act for the selection of a contractor to perform the replacement of the section of the transmission pipeline from the Valchi dol gas pipeline to VA Preselka, as well as to develop an investment project for an optical cable network in the section. A contract with a contractor was signed on 5 June 2020. Auxiliary preparatory activities are ongoing in connection with start of the replacement of the gas pipeline. The investment design for the optic cable line was coordinated by all interested parties and was filed for approval and a building permit was issued by MRDPW. Two contracts were signed for a consultant under article 66 of the SDA for the preparation of a comprehensive report for assessment of the conformity of the investment project and for the exercise of construction supervision during the construction of the site - for the gas transmission gas pipeline and the optics.

5.4.1.3. Activities aligning the compressor stations with the requirements of the complex permits, stage 2 – CS Lozenets, CS Petrich, CS Ihtiman (Part of Phase 2 of PCI 6.8.2.)

The activity is part of the overall concept related to implementation of PCI 6.8.2. "Modernization, rehabilitation and expansion of the existing gas transmission infrastructure":

The Action focusses mainly on the modernization of 3 compressor station by integrating 4 low emission gas turbine compressor units (GTCU).

Procedures assessing the need for an Environmental Impact Assessment (EIA) have been held for each of the compressor stations and as a result the Ministry of Environment and Water (MoEW) issued opinions not to carry out an EIA.

Detailed design plans have been developed and harmonized for the sites of CS Lozenets and CS Ihtiman which are to be approved by the National Expert Council on Spatial Planning and Regional Policy at the Ministry of Regional Development and Public Works (MRDPW).

As a result of a procedure for a public procurement, entitled Modernization of 3 compressor stations by integrating 4 low emission GTCUs, on 1 March 2019 a contract was signed with the selected contractor for investment design, supply of the necessary equipment, execution of construction and installation works and commissioning of construction works for modernization of compressor stations Petrich, Lozenets and Ihtiman by integrating 4 low emission GTCUs namely: Building site I - Reconstruction of CS Petrich with the construction of 1 new GTCU, Building site II - Reconstruction of CS Lozenets with the construction of 2 new GTCU, Building site III - Reconstruction of CS Ihtiman with the construction of 1 new GTCU.

A building permit has been issued in 2020 by the MRDPW for each individual building site.

Building site I – Reconstruction of CS Petrich with the construction of 1 new GTCU was commissioned in February 2021. The other two building sites are under construction.

Expected deadline for the completion of the activities – October 2021.

5.4.2. Construction of pigging facilities (launch and receive traps) for gas pipeline branches Devnya, Burgas, Dimitrovgrad 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 transmission gas pipelines without any need of gas flow interruption and the maintenance of the design pressure as well.

A public competition procedure under the Public Procurement Act (PPA) was held in 2018, entitled Design, Construction and Commissioning of building site Launch and Receiving Traps at Gas Pipeline Branch Burgas based on which a contract was signed, currently underway. An investment design has been prepared for the building site, Phase Workiing design, approved by Bulgartransgaz EAD and coordinated accordingly with the operating companies, the other interested parties and the Consultant under Article 166 of SDA. A building permit has been issued, a building site has been opened and the construction and installation works have started. Expected deadline for the completion of the activities – September 2021.
In 2019, a public procurement procedure was held, entitled: Study, design, delivery (excluding the delivery obligation of the Employer) construction and commissioning of building site: Launch and Receiving Traps at Gas Pipeline Branch Dimitrovgrad. In the beginning of 2020, a contractor was selected and the contract was signed. An investment design has been prepared for the building site, Phase Working design, approved by Bulgartransgaz EAD and coordinated accordingly with the operating companies, the other interested parties and the Consultant under Article 166 of SDA. Building permits for the launch and respective the receive trap have been issued. Expected deadline for the completion of the activities – by the end of 2021.

Following public procurement procedures contractors have been selected and contracts signed the the exercise of consultancy activity under Art. 166, para. 1 of the Spatial Development Act (SPA) for both sites:

5.4.3. Reconstruction of a gas pipeline branch Vratsa 1 including replacement of sections and construction of a receiving chamber at Chiren UGS by replacement of the existing chamber at GRS Vratsa.

The reconstruction aims to increase the natural gas transport reliability in the national gas transmission network. Equalizing the diameter of the entire gas pipeline section "Gas Pipeline Branch (GPB) Vratsa-1" (from pigging facility (PF) Batultsi-1 to Chiren UGS) is envisaged and a new receiving chamber at Chiren UGS is to be build and thus conditions will be provided to perform pigging activities and in-line inspections. The receiving chamber will be dismantled from the existing receiving PF (GMS Vratsa – new) and set on new terrain designed for receiving PF located at the place prior to the connection of GB Vratsa-1 with Chiren UGS. A valve assembly is envisaged to be built near to valve assembly (VA) No 4. The new VA shall divide section VA Tsarevets to Chiren UGS into two shorter sections thus facilitating the pigging activities. A contract for spatial planning, investment design, construction and commissioning of the building site which is in process of implementation, was signed in 2018. A Working Design has been prepared and coordinated with all interested parties and controlling bodies. The activities involving the acquisition of all rights in rem are ongoing.

5.4.4. Increasing the capacity of gas pipeline branch Targovishte

Due to the increased natural gas quantities for transmission to the connected users which exceeds the design quantities, the GPB Targovishte capacity must be increased. This can be achieved by replacing with a greater diameter the existing gas pipeline. A contract for spatial planning, investment design, construction and commissioning of the building site was signed in 2018, which is in process of implementation. The pipeline network part of the site has been completed, the technological equipment, located at the start and end of the gas pipeline branch are under construction. The planned deadline for the site is the 1Q of 2021.

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

All Gas turbine engines (GTE) have the so-called **resource in-between repair works** 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 resource in-between repair works or in case of failure of the equipment during operation, an overhaul shall be carried out to recover the mechanical, environmental and gas dynamic parameters, as well as to ensure its safe and reliable operation in the future (following the overhaul) working hours until reaching the general technical resource.

5.4.6. Reducing the vibrations in the pipeline tie-in of gas motor compressors (GMC) and technological line from GMC to Second sand damper in UGS Chiren

The realization of the construction "Reducing the vibrations in the pipeline tie-in of GMC and technological line from GMC to Second sand damper in UGS Chiren" aims to reduce the vibrations in the technological equipment of Chiren UGS within limits lower than 10 mm/s by construction and installation works and repairs and removing the deviations from the documents registered in the operation of the injection pipelines in Chiren UGS. An investment design, working design phase, has been prepared for the project, and a building permit has been issued. A public procurement for the selection of a contractor for the construction and installation works for the site has been indicated and a contract has been signed. A contract for the designer's supervision during the works for the site was signed.

A public procurement was held and a contract signed for the award of the consultancy activity under Article 166, para 1 of the SDA.

5.4.7. Replacement of pipes at open GMC cycle

The open cycle has a cyclic operational activity (draining the water from the pipelines as means against freezing during the cold period of the year as well, they are to be filled in as to be in operation for the hot period) and as a result the internal wall of the pipelines is highly corrosive. During operation big chunks of rust come off which block the nozzles of the cooling towers and the heat exchangers and create prerequisites for the GMC breakdown due to overheating. This is the main reason which requires the replacement of the pipelines.

An investment design was developed for the project and a building permit was issued. A public procurement for selection of a contractor was announced in 2017 but it was cancelled. In December 2019, a public procurement for the selection of a contractor for the construction and installation works and in May 2020 a contract was signed with the selected contractor. A contract for the designer's supervision during the works for the site was signed as well.

5.4.8. Repair of Pigging Facility Stryama

PF Stryama is a technological facility to a Transit Gas Pipeline DN1000, securing the in-line device receipt and launch whose aim is pipeline cleaning and in-line inspection. PF's repair work is required in connection with the facility accident in 2011.

In 2018, a public procurement was carried out in order to select a contractor to repair the PF based on a prepared investment design. The procurement was terminated and re-announced in 2019, as a result it has been awarded in February 2020. A contractor was selected, and a contract signed, currently under implementation.

5.5. Construction of new sites to the existing infrastructure, required in order to increase the operational efficiency

5.5.1. Implementation of IT platform in compliance of the requirements of the Third Energy Package"

The project for the "Implementation of IT Platform in compliance with the Third Energy Package" is a public procurement envisaged to be carried out: "Supply and implementation of information system "Commercial Dispatching Platform".

The implementation of this procurement will introduce a platform, approved on the European gas market, which will be used to secure the commercial dispatching activities, related to user's registration and contract conclusion, capacity management, nominations administration, matching procedures, quantity allocation, balancing, settlement and invoicing etc. related to Bulgartransgaz EAD main business activity – natural gas transport and the relationships TSO – network user.

5.5.2. Expansion of Chiren UGS capacity - surface equipment - development of an investment design

In 2009, following a PPA procedure, Bulgartransgaz EAD awarded to the Czech company MND the development of a "New technological design for the operation and expansion of Chiren UGS". In 2011 Bulgartransgaz EAD approved the technological design, showing the main guidelines for the expansion and operation of Chiren UGS, determining its technical and economic feasibility based on options, preliminary set by Bulgartransgaz EAD at given increased pressures and volumes of the stored gas.

The approved option for Chiren expansion; is Option III, namely at formation pressure of up to 150 bar, volume of active gas - 1 bcm and daily flow rate of injection and withdrawal up to 8÷10 mcm.

Based on surveys of Chiren UGS, a decision was made for its staged expansion, thereby achieving the following parameters:

- Increase in the reservoir pressure of up to 150 bar (now 110 bar);
- Increase in the active gas volume of up to 1.0 bcm (now 0.55 bcm);
- Increase in daily flowrate of up to 10 mcm/d (now a maximum of 4,7 mcm/d at forced regime).

To achieve the objectives of the expansion, work will be focused on three aspects:

1. Design and construction of new surface equipment – a compressor station with all of the auxiliary equipment to ensure the reliable and continuous operation in the regime of injection and withdrawal of gas and a new gas metering station (GMS).

2. Design and construction of underground equipment – ten new high flowrate exploitation and three observation wells, liquidation of some of the old wells that fail to meet the requirements towards the increase of the formation pressure in the reservoir and new gatherings, linking the exploitation wells with the compressor station.

3. Design and construction of a gas pipeline, linking Chiren UGS with the Balkan Stream gas pipeline.

In March 2021, a contract was signed for the design of the above-ground equipment to expand Chiren capacity and their connection to the existing ones. The objective of the procurement is the preparation of an investment design – phase Working design the realisation of which:

- will create the technical possibility for a staged expansion of Chiren UGS in accordance with Option III of the technological design developed by MND, the Czech

Republic, requested by Bulgartransgaz EAD;

- will ensure the required new reliable compressor equipment, guaranteeing the achievement of the parameters laid down in the technological design;
- will ensure the required new reliable equipment for the rehabilitation of existing sites of the gas transmission network and the construction of new ones;
- will increase the operational safety and increase the capacities of Chiren UGS.

Following the outcomes of the 3D field seismic surveys on the area of Chiren structure, a public procurement will be launched for the design of the underground equipment – ten new high flowrate exploitation and three observation wells and new gatherings, linking the exploitation wells with the compressor station.

DEVELOPMENT OF THE CAPACITY OF BULGARTRANSGAZ EAD GAS INFRASTRUCTURE IN THE PERIOD 2021-2025

This section of the Ten-Year Network Development Plan aims at displaying the development of capacity of the gas infrastructure owned by Bulgartransgaz EAD as a result of the realization of the infrastructure projects and the modernization and rehabilitation of the existing infrastructure and facilities.

The activities of the Company planned for the period 2021-2025 will provide the necessary infrastructure enabling gas flows reception for further transport from and to different regions. Bulgartransgaz EAD provides the necessary cross-border capacity that enables bidirectional transmission of natural gas through the networks. The actual utilization of that capacity and the particular directions of flows will depend on the gas market development in Europe and in the country.

BULGARTRANSGAZ

Estimated capacities for the period 2021 -2025

As of 1 January, MWh/d	2021	2022	2023	2024	2025
National Gas Transmission Network (NGTN)					
Entry capacity	404,413	411,816	477,129	484,528	491,927
IP Negru voda 1	214,390	214,390	214,390	214,390	214,390
Interconnection Ruse/Giurgiu	26,959	26,959	26,959	26,959	26,959
Interconnection Greece-Bulgaria (IGB)**	96,685	96,685	96,685	96,685	96,685
Interconnection Bulgaria - Serbia (IBS)*	0	0	57,918	57,918	57,918
GMS Chiren	40,377	47,780	55,175	62,574	69,973
Domestic Production	26,002	26,002	26,002	26,002	26,002
Exit capacity	483,184	503,322	568,635	607,744	615,143
IP Negru voda 1/Kardam	121,664	121,664	121,664	121,664	121,664
Exit zone Bulgaria	273,479	286,214	286,214	317,924	317,924
Interconnection Ruse/Giurgiu (IBR)	26,490	26,490	26,490	26,490	26,490
Interconnection Greece-Bulgaria (IGB)**	21,174	21,174	21,174	21,174	21,174
Interconnection Bulgaria - Serbia (IBS)**	0	0	57,918	57,918	57,918
GMS Chiren	40,377	47,780	55,175	62,574	69,973
Gas Transmission Network for Transit Transmission (GTNTT)					
Entry capacity	1,286,033	1,708,033	1,708,033	1,708,033	1,708,033
IP Negru Voda 2,3/Kardam	624,077	624,077	624 077	624 077	624 077
IP Kulata/Sidirokastro**	64,826	64,826	64,826	64,826	64,826
IP Strandzha/Malkoclar	0	105,500	105,500	105,500	105,500
IP Strandzha 2/Malkoclar	576,030	576,030	576,030	576,030	576,030
IP Kireevo/Zaycar	21,100	337,600	337,600	337,600	337,600
Exit capacity	822,627	1,049,452	1,049,452	1,049,452	1,049,452
IP Strandzha/Malkoclar	497,168	497,168	497,168	497,168	497,168
IP Kulata/Sidirokastro	117,804	117,804	117,804	117,804	117,804
Kyustendil/Zhidilovo	27,384	27,384	27,384	27,384	27,384
Exit zone Bulgaria	6,196	6,196	6,196	6,196	6,196
IP Kireevo/Zaycar	174,075	400,900	400,900	400,900	400,900
Transfer point entry NGTN-GTNTT	322,385	322,385	322,385	322,385	322,385
Transfer point exit NGTN-GTNTT	21,117	21,117	21,117	21,117	21,117

* Physical and/or commercial reverse flow capacity.
** These capacities at entry and exit point are design ones and may change after being commissioned.
*** A possible capacity increase may take place after beyond 2023 in connection with the realisation by DESFA S.A. Of projects for CS Kipi and CS Ambelia.

CONCLUSION

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

The priority activities in the development of Bulgartransgaz EAD infrastructure in the period 2021 – 2030 are the following:

- Maintenance of a technically good working, reliable and efficient main and auxiliary gas infrastructure;
- Modernization, rehabilitation and expansion of the existing gas transmission networks and equipment;
- Development of the interconnectivity;
- Expansion of the natural gas storage capacity.

During the period 2020 – 2030 the construction and commissioning of new gas interconnections with the neighbouring countries are scheduled as well as the commissioning of the LNG terminal near Alexandroupolis. Upon implementation of the Company'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. As a result, the natural gas supplies to the country and the region will be ensured, creating real conditions for diversification of the sources and routes of natural gas supply to and through Bulgaria.

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 gas transmission network. The implementation of all these projects is interrelated and aims at contributing to the efficiency and development of the common European gas network.

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

The expected outcome from the implementation of this TYNDP is the significant increase in the quality and volume of the services offered by Bulgartransgaz EAD related to natural gas transport and storage which is in direct connection with the transformation of Bulgaria into a significant regional gas hub - a hub where technical capabilities shall be created for entry and exit of natural gas flows coming from various sources and along new routes.

The TYNDP implementation will strengthen the successful business model of 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

- 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 22.11.2018 and Decision of the National Assembly of 30.11.2018, promulgated in State Gazette 101 of 07.12.2018.
- National Recovery and Resilience Plan
- EU Hydrogen Strategy
- Energy Systems Integration strategy
- Ministry of Energy of the Republic of Bulgaria (www.me.government.bg)
- Energy and Water Regulatory Commission (www.dker.bg)
- National Statistical Institute - GDP, PEC, EEC and other data (www.nsi.bg)
- Data on natural gas consumption, Eurostat, (www.epp.eurostat.ec.europa.eu)
- National energy balance of the Republic of Bulgaria (www.nsi.bg)
- Bulletin on the energy status and development in the Republic of Bulgaria in 2019 (www.me.government.bg)
- A list of Projects of Common Interest, webpage of the European Commission, Directorate-General Energy, (www.ec.europa.eu)
- Reports on the State of the Energy Union - (https://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 EAD (www.bgenh.com)
  - Balkan Gas Hub (www.balkangashub.bg)
  - Gazprom (www.gazprom.com)
  - Rosneft (www.rosneft.com)
  - White Stream (www.white-stream.com)
  - IGI Poseidon (www.igi-poseidon.com)
  - DESFA S.A. (www.desfa.gr)
  - DEPA S.A. (www.depa.gr)
  - Gastrade (www.gastrade.gr)
  - Prometheus Gas (www.prometheusgas.gr)
  - Energean Oil & Gas (www.energean.com)
  - HRADF (www.hradf.com)
  - JP Srbijagas (www.srbijagas.com)

- GAMA AD (www.gama.com.mk)
- LNG Hrvatska (www.lng.hr)
- ICGB AD (www.icgb.eu)
- ITGI (www.edison.it)
- TAP (www.trans-adriatic-pipeline.com)
- Shah Deniz (www.bp.com)
- ANRE - National Energy Regulatory Authority (www.anre.ro)
- Transgaz S.A. (www.transgaz.ro)
- Romgaz (www.romgaz.ro)
- CEPA - (www.cepa.org)
- BOTAS (www.botas.gov.tr)
- EMRA – Turkish Natural Gas Market – Report 2017
- Ministry of Foreign Affairs - Turkey's Energy Profile and Strategy (www.mfa.gov.tr)
- AIIB – Turkey Gas Storage Expansion Project 2018
- ETKILIMAN – (www.etkiliman.com.tr)
- ENTSOG (www.entsog.eu)
- Delek Drilling (www.delekdrilling.co.il)

- Information related to natural gas production in Bulgaria, webpage Petroceltic International Plc (the former Melrose Resources), (www.petroceltic.com)
- Bulgartransgaz EAD 2021-2025 Business Program, approved by decision under Protocol No 499/27.12.2019 of Bulgartransgaz EAD Management Board and decision under Protocol No 01/07.01.2021 of Bulgartransgaz EAD Supervisory Board
- Regional Investment Plan 2019 Central and Eastern Europe (www.entsog.eu)
- Regional Investment Plan 2017-2026 South Corridor (www.entsog.eu)
- 2020 ENTSOG Ten-Year Network Development Plan (www.entsog.eu)
- GIE – Gas Infrastructure Europe
- IEA - International Energy Agency – Report 2020 (www.iea.org)
- EIA – U.S Energy Information Administration (www.eia.gov)
- IENE – Institute of Energy for South–East Europe (www.iene.eu)
- BP Statistical Review of World Energy 2020 (www.bp.com)
- Ministry of Energy and Natural Resources – Republic of Turkey (www.enerji.gov.tr)
- IICEC – Istanbul International Center for Energy and Climate
- GAZBIR - Natural Gas Distribution Companies Association of Turkey
- MER JSC Skopje - Macedonian Energy Resources Skopje (www.mer.com.mk)
- Consilium Europa – (www.consilium.europa.eu)
- Platts (www.platts.com)

- CESEC Plenary and Working Group, 13 February 2020
- Information from other corporate documents and correspondence with stakeholders

Appendix 1

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

No.	Project	Final investment decision (FID)	Deadline for completion	Contractor	Expected value of the investment (excluding VAT)	Financing	Infrastructure	Capacity
I.	**Projects contributing the implementation of the Balkan Gas Hub concept**							
1	Expansion of Bulgartransgaz EAD gas transmission network in the section from BG-TR to BG-RS	Yes	2021	Bulgartransgaz EAD	~ 1,415 million €	Own and attracted external funding	~ 480 km Dn 1200 + 2 new CS + 1 new GMS	New capacity from Turkey (17.93 bcm/y), new capacity to Serbia (13.03 bcm/y)
2	Interconnection Bulgaria-Serbia (IBS)	Yes	2022	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
3	Interconnection Greece-Bulgaria (IGB)	Yes	2021	ICGB AD	~ 240 million €[1] (~ 4 million €)	Bulgartransgaz EAD own funding for the connection to the existing network	A total of 182 km; 151 km of which on Bulgarian territory	3 bcm/y - I stage 5 bcm/y - II stage
4	Rehabilitation, modernization and expansion of the Bulgarian gas transmission system - Phase 2	Yes	2022	Bulgartransgaz EAD	~ 340 million €	Own and attracted external funding	Section replacement - ~ 81 km; modernization of 3 CS - 4 GTCUs	Total incremental capacity following project implementation - ~ 3 bcm/y
5	Capacity increase of Chiren UGS	No	2024	Bulgartransgaz EAD	~ 308 million €	Own and attracted external funding	Ground facilities (CS, GMS etc.); gas pipeline ~ 45 km; Construction of operational and monitoring wells, repair and liquidation of existing wells	Increase of the working gas volume of up to 1 bcm and increase of the withdrawal and injection capability up to 8-10 mcm/d
6	The LNG terminal near Alexandroupolis[2]	No	2024	Gastrade S.A.	~ 370 million € (29.6 million €)	Own and attracted external funding	FSRU (Floating, storage and regasification units) for reception, storage and regasification of LNG	Design capacity for regasification and supply - 6.1 bcm/y; Storage capacity - 170 thousand cubic meters

Notes:

[1] Estimated total value of the project developed by a third party, i.e. "third party projects". The costs for connection to Bulgartransgaz EAD network are shown in brackets

[2] Bulgartransgaz EAD participates with 20% of the share capital of the project company. The estimated value of the participation of Bulgartransgaz EAD in the project company is in brackets. Up-to-date information about the project is available on Gastrade S.A. website.

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