THE REPUBLIC OF BULGARIA

MINISTRY OF ENERGY

PREVENTIVE ACTION PLAN
TO SAFEGUARD THE SECURITY OF GAS SUPPLY

2024

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List of abbreviations and definitions

RB - Republic of Bulgaria
NRiAss - National Risk Assessment
RRA - Regional Risk Assessment
JRC - EU Joint Research Centre
Dmax - total daily gas consumption (in mcm/d) within the defined area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.
Deff - means that part of Dmax (in mcm/d) that in the case of a disruption of gas supply can be sufficiently and timely covered with market-based demand-side measures in accordance with point (c) of Article 9(1) and Article 5(2).
EU - European Union
EC - European Commission
ERO - Energy Regulatory Office
MS - Member State(s)
OER Chairperson - Chairperson of the Office for Energy Regulation
EFTA - European Free Trade Association
ENTSOG - European Network of Transmission System Operators for Gas
ReCo - Regional Coordination System for Gas established by ENTSOG
SGT - System of Transit Gas Pipelines
OGP - Oil and gas producers
SSO - Storage system operator
TSO - Transmission system operator
NGTN - National gas transmission network
GCG - Gas Coordination Group
GTNTT - Gas transmission network for transit transmission
LNG – Liquefied Natural Gas
UGS - Underground Gas Storage
AGRS – Automatic Gas Regulation Station
GMS — Gas Metering Station
GRS – Gas Regulation Station
CS – Compressor Station
TAP – Trans-Adriatic Pipeline
IGB - Interconnection Greece–Bulgaria
IBS - Interconnection Bulgaria–Serbia
IBR - Interconnection Bulgaria-Romania
PCI – Project of Common Interest
IP - Interconnection point
Regulation (EU) 2017/1938 - Regulation of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010
MSm³/d – million standard cubic metres (conditions for Bulgaria — T=20°C and P=1.01325 bar(a)) gas per day (24 hours).

GENERAL INFORMATION

This Preventive Action Plan has been drawn up in accordance with Article 72a paragraph 1 item (1) of the Energy Act and Articles 8 and 9 of Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010 (the Regulation). It is aligned with the National Risk Assessment (NRiAss) of the Republic of Bulgaria and has been developed following consultations with natural gas undertakings, relevant organisations representing the interests of household and industrial natural gas customers, including electricity producers, and the national regulatory authority, the Energy and Water Regulatory Commission (EWRC).

Member States within the risk groups

According to Annex I of the Regulation, the Republic of Bulgaria participates in three risk groups related to gas supplies from the east i.e. Ukraine and Trans-Balkan and from the southeast i.e. Southern Gas Corridor-Caspian Sea.

Risk Group Ukraine includes: Bulgaria, Czech Republic, Denmark, Germany, Greece, Croatia, Italy, Luxembourg, Hungary, Austria, Poland, Romania, Slovenia, Slovakia and Sweden;

Risk Group Trans-Balkan includes: Bulgaria, Romania, Greece and Hungary.

Risk Group Southern Gas Corridor - Caspian Sea includes: Bulgaria, Greece, Croatia, Italy, Hungary, Malta, Austria, Romania, Slovenia and Slovakia.

Name of the competent authority responsible for the preparation of the plan

The Minister of Energy of the Republic of Bulgaria is the competent authority on issues related to the security of natural gas supply within the meaning of Article 3 paragraph 2 of Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010. The Minister of Energy is a special competence body of the central (executive branch of) government under whose authority a separate ministry operates that conducts the country's energy policy.

MEMBER STATE	COMPETENT AUTHORITY
Republic of Bulgaria	Ministry of Energy Address: 1000 Sofia, 8 Triaditsa Str. Phone: (+359 2) 9263 152 Fax: (+359 2) 980 76 30 E-mail: e-energy@me.government.bg; (http://www.me.government.bg)

The Energy and Water Regulation Commission (EWRC) is the national regulatory authority according to Article 41 Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC. EWRC is an independent specialised state body responsible for regulating the activities in the energy sector and in the water supply and sewerage

services. The responsibilities of the KEVR in the energy sector include energy market monitoring, price and license control with respect to the electricity transmission, supply, distribution and distribution of electricity in a closed electricity distribution network; natural gas storage, transmission, supply, distribution and distribution of natural gas in a closed gas distribution network, trade in electricity or natural gas, public supply of electricity and natural gas; organised exchange market for electricity and natural gas; organised exchange market for electricity and natural gas in a closed gas distribution network. (http://www.dker.bg)

1. Description of the system

1.1. Brief consolidated description of the regional gas system for each risk group in which Bulgaria participates.

The regional gas system in South-East Europe comprises the gas transmission systems of the countries participating in:

Eastern gas supply risk groups:

a) Ukraine: Bulgaria, Czech Republic, Denmark, Germany, Greece, Croatia, Italy, Luxembourg, Hungary, Austria, Poland, Romania, Slovenia, Slovakia, Sweden;

b) Tans-Balkan: Bulgaria, Greece, Romania, Hungary.

c) South-East gas supply risk groups: Southern Gas Corridor — Caspian Sea: Bulgaria, Greece, Croatia, Italy, Hungary, Malta, Austria, Romania, Slovenia, Slovakia;

The Transmission Capacity Map, published on the ENTSOG website, https://www.entsog.eu/maps#transmission-capacity-map-2021, provides an overview of the main high-pressure transmission lines in Europe and gives information on the technical capacity at cross-border points. The System Development Map (published on the same website, jointly with GIE) provides a compact and regular overview of the existing gas infrastructure and its development prospects, as well as of the actual supply and demand situation at both European and national level in terms of the relevant year.

A map of existing and under construction LNG terminals in Europe is published on the website of Gas Infrastructure Europe, https://www.gie.eu/publications/maps/gie-lng-map/ and provides information on LNG storage capacity and the main terminal characteristics. Planned or under study LNG terminals projects are also detailed.

Up-to-date data on natural gas storage in the underground gas storage facilities of the countries in the respective risk groups are available at: https://agsi.gie.eu/#/historical/21X-BG-A-A0A0A-C/BG.

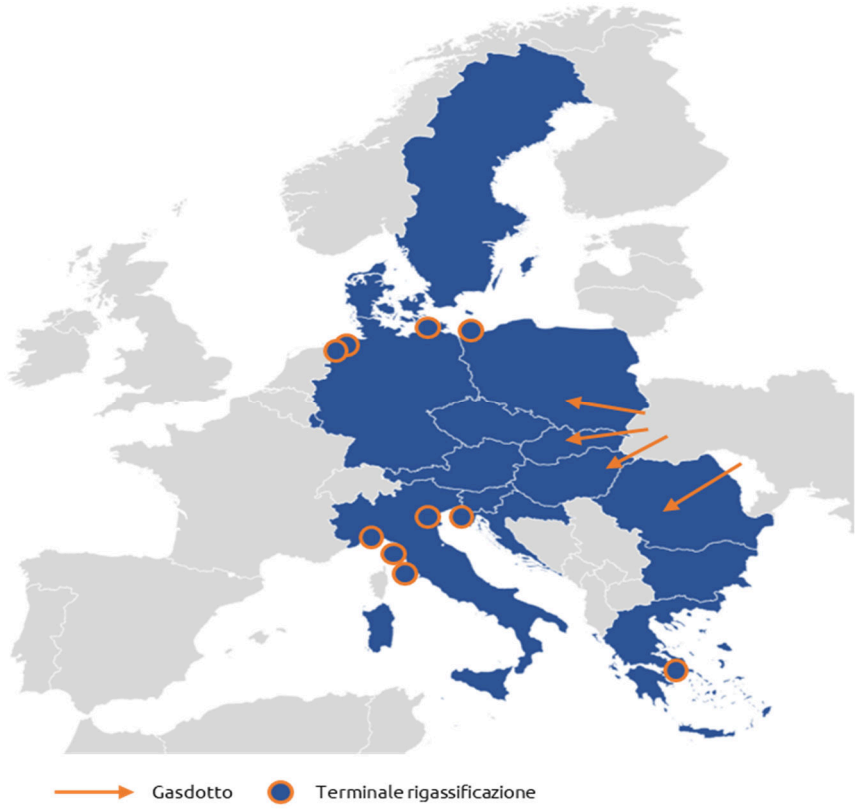
1.1.1. Regional Risk Group Ukraine[1]

Regional risk group Ukraine for eastern gas supply includes: Bulgaria, Czech Republic, Denmark, Germany, Greece, Croatia, Italy, Luxembourg, Hungary, Austria, Poland, Romania, Slovenia, Slovakia and Sweden.

Risk Group Ukraine includes four IPs with Ukraine: Drozdwicze in Poland, Budince in Slovakia, Beregdaróc in Hundagy and Isaccea in Romania and has 10 LNG terminals with a total maximum capacity of 1,703.5 GWh/d. In the coming years, the number of LNG terminals will increase to 12. The total storage capacity of the risk group is 766.25 TWh and the daily production is equal to 729.01 GWh/d. Gas consumption for the risk group in 2021 amounts to 2,750.69 TWh and the installed capacity for electricity production from gas-fired power plants is 97,204.65 MWe.

[1] The information referred to in section 1.1.1. for Risk Group Ukraine is taken from the General Risk Assessment - Risk Group Ukraine, which was prepared in 2022.

Below is a map of the countries in Risk Group Ukraine together with the IPs and LNG terminals:



The competent authorities of the Member States of Risk Group Ukraine are as follows:

Member States	Competent Authority
Austria	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
Bulgaria	Ministry of Energy
Croatia	Ministry of Economy and Sustainable Development
Czech Republic	Ministry of Industry and Trade
Germany	Federal Network Agency
Greece	Regulatory Authority for Energy
Hungary	Energy and Public Utility Regulatory Authority
Italy	Ministry of Environment and Energy Security
Luxembourg	Ministry of the Economy
Poland	Ministry of Energy
Romania	RPRO Bucharest, Ministry of Energy
Slovenia	Energy Agency

SK	Ministry of the Economy
Sweden	Ministry of Climate and Enterprise
Denmark	Ministry of Climate, Energy and Utilities

1.1.2. Eastern Risk Group Trans-Balkan[2]

Eastern Risk Group Trans-Balkan includes Bulgaria, Greece, Romania and Hungary. The group's annual final-use natural gas consumption for 2021 is 35.8 bcm.

South East Europe is one of the most vulnerable areas in terms of security of gas supply as the region is still dependent on Russian supplies. The majority of gas imports from Russia to the countries in the risk group come via Turkish Stream through the cross-border point between Bulgaria and Türkiye (EP1), with small quantities also imported through IP Isaccea (at the border between Romania and Ukraine - IP2) and through the IP between Hungary and Ukraine (at Bereg-EP5). Russian gas transiting Bulgaria is imported from Türkiye (EP1) and delivered to customers in Greece (via Sidirokastro), the Republic of North Macedonia (via Zhidilovo (EXP1)), Serbia (via Kireevo (EXP2)) and Hungary (via Kiskundorozsma -EP7, transit via Serbia).

There are additional entry points between individual countries in the risk group through which non-Russian gas, including LNG, can be supplied, such as the IPs between Croatia and Hungary (at Dravaszerdahely - EP6), Austria and Hungary (at Mosonmagyarovar - EP4), Slovakia and Hungary (at Balassagyarmat - EP5), Romania and Ukraine (at Mediesu-Aurit - EP2), Romania-Moldova (at Ungheni - IP1), Greece and Türkiye (at Kipoi - EP8), Bulgaria and Serbia (IBS) (at Kalotina), Greece and Bulgaria (IGB) (Komotini-St. Zagora). The connection between the Greek natural gas system and the TAP pipeline in Nea Mesimbria (EP9) also contributes to the security of gas supply in South East Europe.

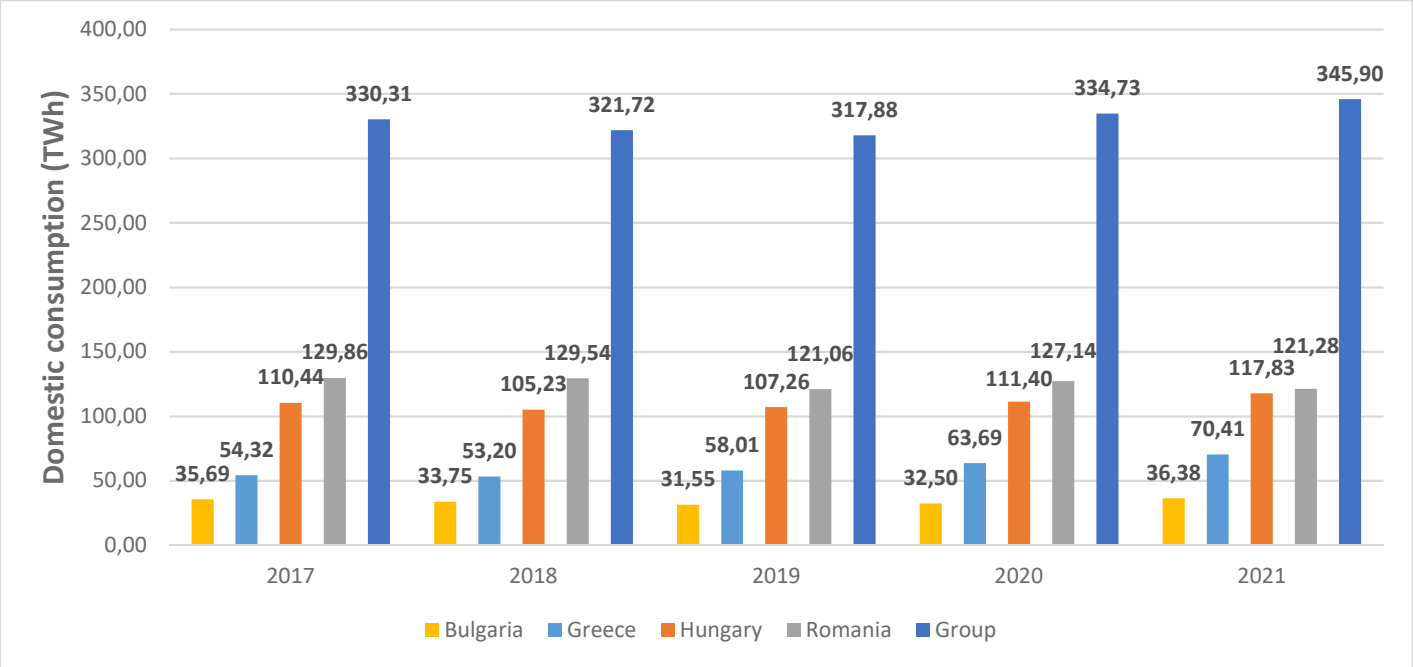
Below is a map of the countries of the Eastern Risk Group Trans-Balkan together with the entry (EP) and exit (EXP) points of natural gas for the region of the group:

[2] The information referred to in section 1.1.2. is taken from the General Risk Assessment - Eastern Risk Group Trans-Balkan, which was prepared in 2022.

The competent authorities of the four Member States are as follows:

Member State	Competent Authority
Bulgaria	Ministry of Energy
Greece	Regulatory Authority for Energy (RAE)
Romania	Ministry of Energy
Hungary	Hungarian Energy and Public Utility Regulatory Authority Ministry for Innovation and Technology

The graph below shows the consumption development for each country in the Eastern Risk Group Trans-Balkan from 2017 to 2021, as well as the total consumption for the risk group.



1.1.3 Risk Group Southern Gas Corridor - Caspian Sea:

Risk Group Southern Gas Corridor — Caspian Sea includes Bulgaria, Greece, Croatia, Italy, Hungary, Malta, Austria, Romania, Slovenia and Slovakia;

The competent authorities of the Member States of the Risk Group Southern Gas Corridor - Caspian Sea are as follows:

Member States	Competent authority
Austria	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
Bulgaria	Ministry of Energy
Croatia	Ministry of Economy and Sustainable Development of Croatia
Greece	Regulatory Authority for Energy
Hungary	Energy and Public Utility Regulatory Authority
Italy	Ministry of Environment and Energy Security

Malta	Ministry for the Environment, Energy and Enterprise
Romania	RPRO Bucharest, Ministry of Energy
Slovenia	Energy Agency
SK	Ministry of the Economy

1.2. Brief description of the gas system of the EU Member States to which natural gas can be supplied through the territory of Bulgaria

1.2.1 Gas system of Greece

The national natural gas system (NNGS) of Greece supplies natural gas to consumers in the continental part of the country from the Bulgarian-Greek and Turkish-Greek borders and from the liquefied natural gas (LNG) terminal located on the Revithoussa Island in the Gulf of Megara.

A diagram of the Greek gas transmission network is set out below.

The length of the Greek gas transmission network is 1,456 km. The network has cross-border connection points with Bulgaria (Kulata/Sidirokastro and Komotini/St. Zagora) and Türkiye (Kipoi). The network comprises a high-pressure main gas pipeline (70 bar) with a length of 512 km and pipe diameter of 36", and several high-pressure branches (70 bar) with a total length of 954 km and pipe diameter of 30", which supply gas to various parts of the country. Gas is also supplied to Greece via the Revithoussa LNG terminal, which has a regasification capacity of 7 bcm/y and a storage capacity of 225,000 m³. Greece does not produce natural gas and there are no underground natural gas storages in the country. The 878 km long Trans-Adriatic Pipeline (TAP) is part of the Southern Gas Corridor, transporting natural gas to Europe from Shah Deniz II field in Azerbaijan. The current annual capacity is 10 bcm/y, with the possibility of doubling. The pipeline is connected to the Trans-Anatolian Gas Pipeline (TANAP) at the Turkish-Greek border and passes through Greece, Albania and the Adriatic Sea, reaching its end point in Southern Italy. Commercial operation of the gas pipeline began in November 2020. The Alexandroupolis terminal, which will have a regasification capacity of 5.5 bcm/y, is also planned to be operational from early 2024. It is expected that by 2024 there will be five LNG terminals in the country, with a total regasification capacity of up to 25.7 bcm/y. In 2022, total natural gas consumption stood at 5.2 bcm.

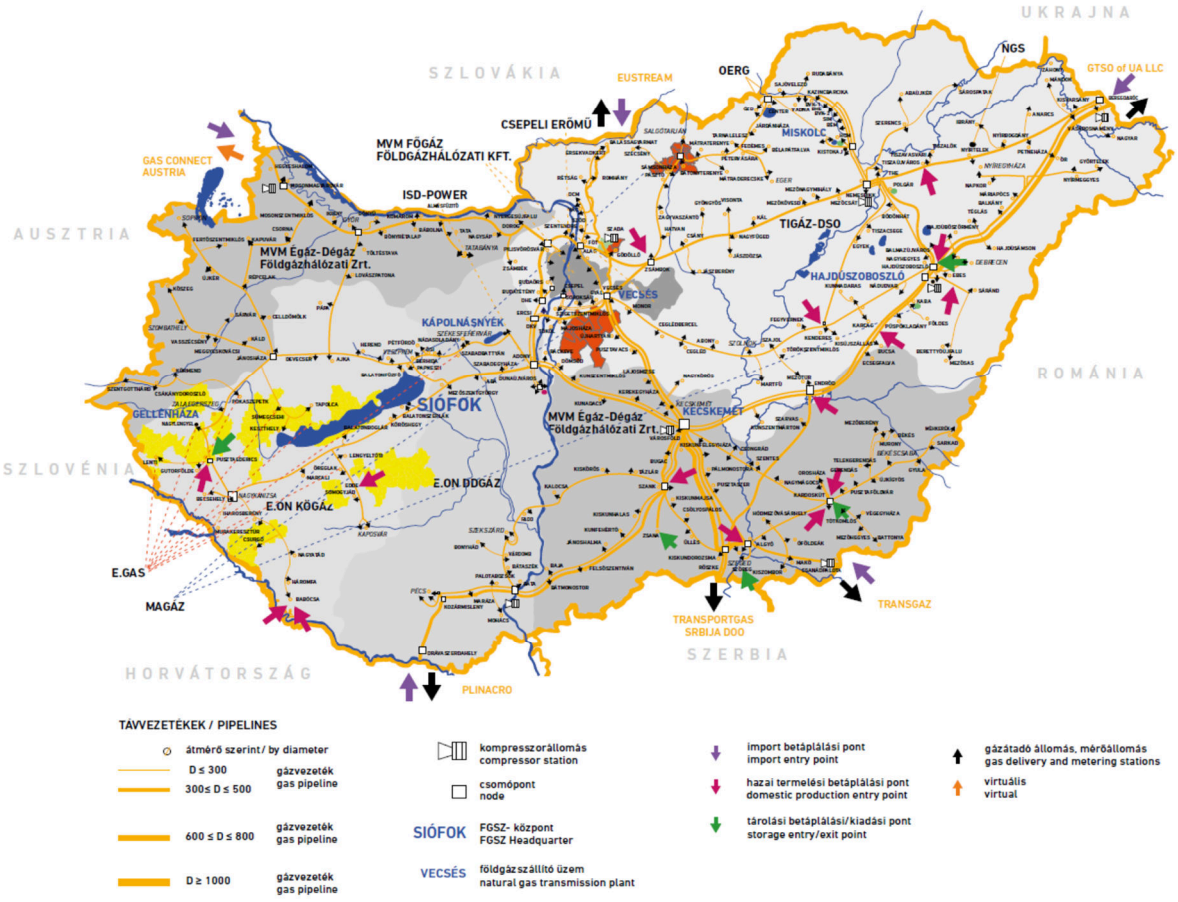
1.2.2. Gas system of Romania

The Romanian gas transmission network extends over more than 14,200 km. The national network has cross-border connection points with Moldova (Ungheni), Ukraine (Orlovka/Isaccea and Mediesul Aurit/Tekovo), Bulgaria (Negru Voda/Kardam and Giurgiu/Ruse) and Hungary (Csanapadlota/Nadlac). The Romanian gas transmission network includes 8 compressor stations (Sinca, Onesti, Silistea, Jupa, Podisor, Bibesti, Onesti-M and Gherăești) located along the main transport routes with a total installed capacity of 70.2 MW. The Romanian storage system has a total operating capacity gas capacity of 3.07 bcm. The country has significant domestic production, sufficient to cover about 70% of the country's consumption. Romania has six gas storage facilities with a total capacity of 3.1 bcm. In 2022, total natural gas consumption stood at 10.2 bcm.

A diagram of the Romanian gas transmission network is set out below.

1.2.3. Gas system of Hungary

The Hungarian gas transmission network has a total length of 5,894 km. The national network has cross-border interconnections with Ukraine (Beregdaroc), Slovakia (Balassagyarmat), Austria (Mosonmagyarovar), Croatia (Dravaszerdahely), Romania (Csanadpalota) and an exit only to Serbia (Kiskundorozsma). Hungary's gas transmission network includes 8 compressor stations (Beregdaróc, Nemesbikk, Hajdúszoboszló, Városföld, Báta, Mosonmagyaróvár, Szada, Csanádpalota). Hungary does not have an LNG terminal, but the Croatian LNG terminal was completed by the end of 2020, giving the country access to new import sources through the entry point HRHU. The Croatian terminal on Krk Island, long planned to receive LNG, began commercial operations on 1 January 2021, giving Hungary access to LNG marine supplies through the now completed Hungarian-Croatian connection. According to data published on LNG Croatia LLC's website, 100% of the capacity for the first three gas years has been booked by Croatian, Hungarian and Qatari operators and there is already significant demand for the next announced years. In 2021, total natural gas consumption stood at 11.06 bcm.



1.2.4. Gas system of Bulgaria

Bulgaria's gas system comprises all activities relating to the production, transmission, storage, distribution and supply of natural gas to satisfy customers' needs. It includes facilities and infrastructure that enable the production, transmission, storage and distribution of natural gas in the country. These operate as a single interconnected gas transportation system. Bulgaria's gas system comprises of a gas transmission network with a total length of 3,594 km, including 151 km of the IGB gas pipeline on the Bulgarian territory and an underground gas storage facility in Chiren (Chiren UGS). The gas transmission system in Bulgaria has IPs with all neighbouring countries - Romania (Negru Voda/Kardam and Ruse/Giurgiu), Greece (Kulata/Sidirokastro and Stara Zagora-IGB gas pipeline), the Republic of North Macedonia (Kyustendil/Zhidilovo), Serbia (Kireevo/Zaycar and Kalotina/Dimitrovgrad) and Türkiye (Strandzha/Malkoclar and Strandzha 2/Malkoclar). The main natural gas quantities required for domestic consumption are supplied by imports.

At present, there are two TSOs on the territory of the Republic of Bulgaria - Bulgartransgaz EAD and ICGB AD, which hold a license for the activity of natural gas transmission. The gas transmission network of Bulgartransgaz EAD comprises of 3,443 km gas pipelines and gas pipeline branches, as well as eleven compressor stations – CS Kardam-1, CS Kardam-2, CS Valchi Dol, CS Polski Senovets, CS Rasovo, CS Provadia, CS Nova Provadia, CS Lozenets, CS Strandzha, CS Ihtiman and CS Petrich, with approximate total installed capacity of 389 MW,

electrochemical protection system, pigging facilities, communication system, information system and other auxiliary facilities.

The gas transmission infrastructure of ICGB AD connects the gas transmission networks of Greece and Bulgaria (between Komotini and St. Zagora) and consists of 182.6 km of gas pipeline (ICGB), of which 151 km on Bulgarian territory, electrochemical protection system, pigging facilities, communication system, information system and other auxiliary facilities.

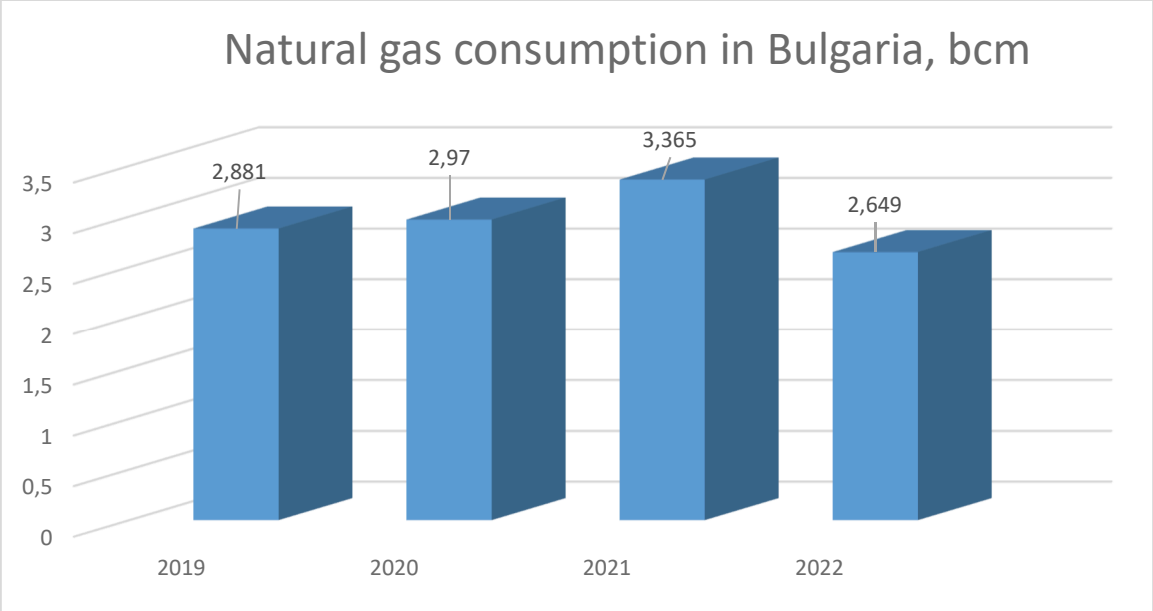
The underground gas storage facility (UGS) in Chiren is an important component of Bulgaria's gas system. It has a total storage capacity of 1,300 mcm, including 550 mcm for working gas and 750 mcm for buffer gas.

There is also a negligible local production in the Republic of Bulgaria with entry points from local production onshore (GMS Dolni Dabnik) and offshore (GMS Galata). Due to the depletion of local reserves, it covers less than 0.3% of the country's annual consumption, with a downward trend.

a) Main figures on natural gas consumption in Bulgaria

The annual domestic natural gas consumption by years for the period 2019-2022 is as follows:

- 2019 – 2,881 bcm;
- 2020 – 2,970 bcm;
- 2021 – 3,365 bcm;
- 2022 – 2,649 bcm;

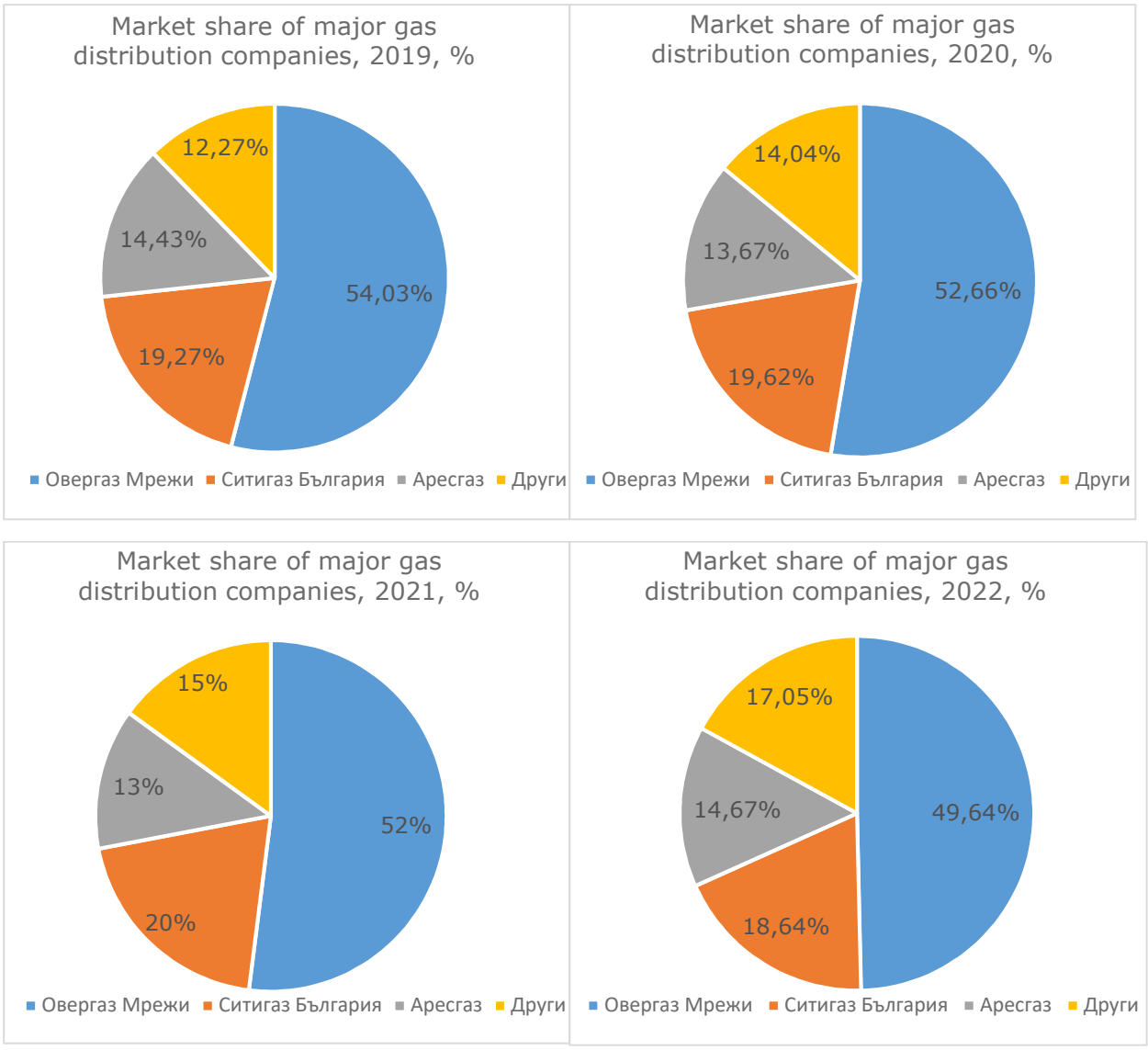


The major consumers of natural gas in Bulgaria are enterprises operating in the energy sector and the chemical industry. It is 47% in 2022. Their consumption from 2019 to 2022 by years is as follows:

- 2019 – 1,878 bcm;
- 2020 – 1,633 bcm;
- 2021 – 1,689 bcm;
- 2022 – 1,281 bcm;

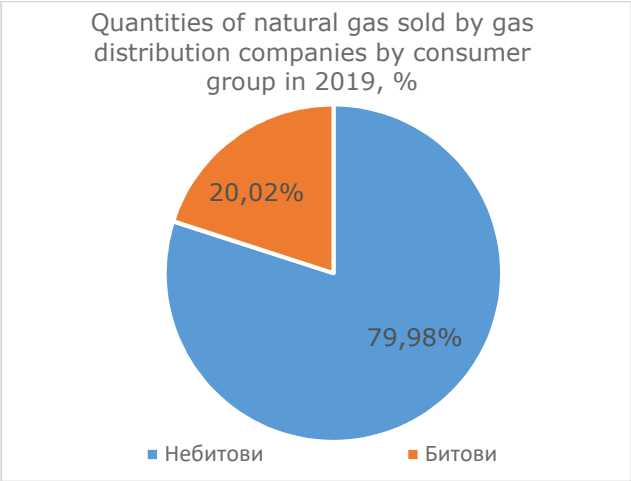
Gas distribution companies in the country have a relative share of consumption between 12% and 13%. In 2019, gas distribution companies supplied 505 bcm of natural gas to their

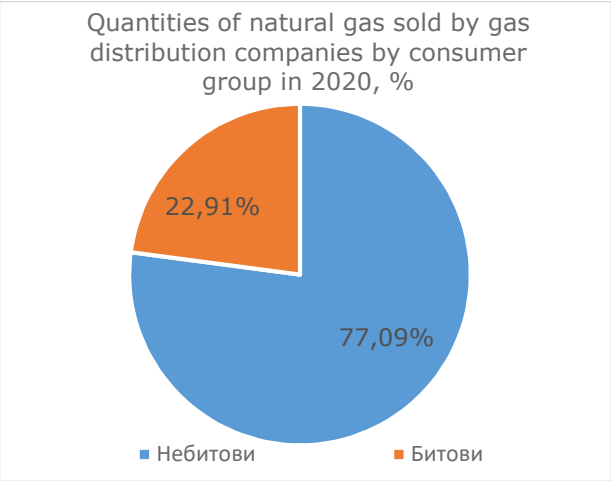
customers and in 2020, 2021 and 2022 the corresponding quantities stood at 0.536 bcm, 0.582 bcm and 0.470 bcm, respectively. Overgas Mrezhi AD, Citigas Bulgaria EAD and Black Sea Technological Company (BSTC) AD are the gas distribution companies with the biggest market share in the country. The graph below shows their relative market share for the period 2019-2022, respectively.

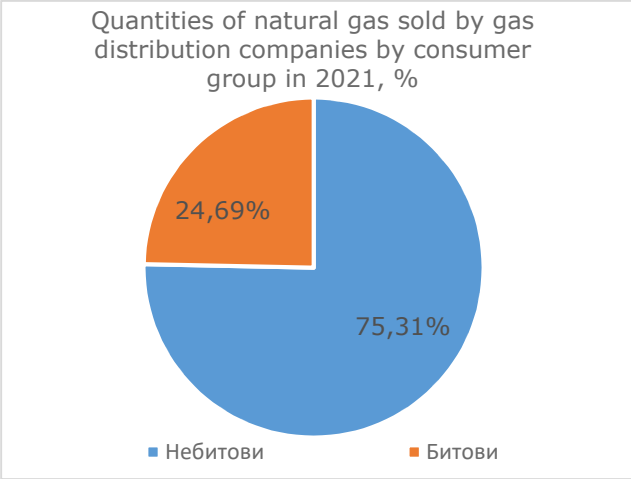


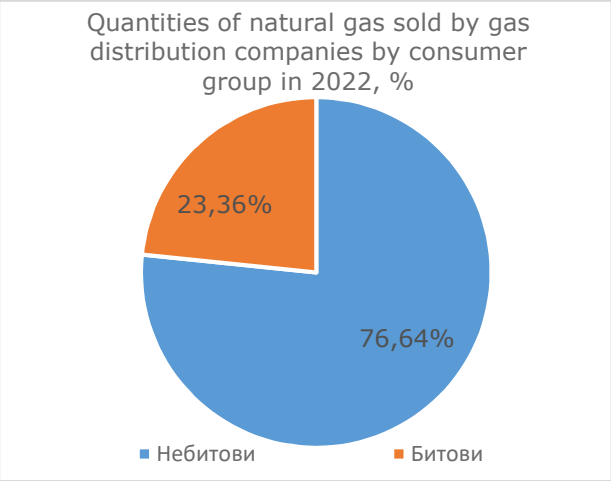
The quantities and the number of customers' types of the gas distribution companies in the period 2019 - 2022 are as follows:

Customers	**2019**	**2020**	**2021**	**2022**	**2019**	**2020**	**2021**	**2022**
	bcm	**bcm**	**bcm**	**bcm**	**pcs.**	**pcs.**	**pcs.**	**pcs.**
Domestic	101.048	122.678	143.811	109.768	101,050	112,656	127,056	128,827
Non-household	403.584	412.831	438.577	359.917	6,894	7,032	7,597	7,442









b) Functioning of the gas system at national level

The functioning of the national gas system in Bulgaria is directly linked to the activities of the two gas transmission companies in Bulgaria - Bulgartransgaz EAD (which also owns the underground gas storage facility Chiren UGS) and ICGB AD, as well as the national public gas supplier Bulgargaz EAD.

Bulgartransgaz EAD is a sole joint stock company within the meaning of the Commerce Act. Bulgarian Energy Holding EAD is the Company's ultimate controlling entity. The sole owner of the capital of BEH EAD is the Bulgarian State, through the Minister of Energy. 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 (Chiren UGS) connected to it. The Company pursues transparent and responsible behaviour policy and aims at ensuring secure conditions and sustainable development of the natural gas market in the country and the region in compliance with the principles of equality and transparency. As part of the common European gas network Bulgartransgaz EAD is guided by the requirements of the European and the Bulgarian legislation. In its capacity as combined transmission system operator (TSO) and gas storage operator (GSO), it enables the development and reliable functioning of natural gas transmission and storage infrastructure in Bulgaria. "Bulgartransgaz EAD is the operator of the unified gas transmission system in Bulgaria, which enables the transmission of natural gas to the gas distribution networks and non-household natural gas customers in the country, gas transmission to the neighbouring countries Romania, Greece, Serbia and the Republic of North Macedonia, as well as the storage of natural gas through Chiren UGS to cover seasonal fluctuation in consumption and to provide an emergency reserve in case of unforeseen and force majeure situations. The Company carries out natural gas transmission and storage

activities on the basis of licenses issued by the Energy and Water Regulatory Commission. The company develops its network in line with regional and common European plans and priorities in a manner that enables free flow of natural gas through the territory of the country and ensures access to different natural gas sources.

The activities relating to the distribution and supply of natural gas to customers connected to the distribution networks are performed by regional and local gas distribution companies. These (mostly private) entities operate under the terms of issued licences and the prices they charge are subject to regulation. Production companies and two main groups of connected customers - gas distribution companies and non-household customers are connected to Bulgartransgaz EAD gas transmission network.

Chiren UGS was built on the lands of Chiren village in northwestern Bulgaria, based on a depleted gas condensate field. It is equipped with specialized underground and surface facilities required to secure injection, production and quality of the stored gas. Chiren UGS has 24 exploitation wells and a compressor station of approximately 9 MW total installed capacity. Its current capacity is sufficient for the storage of 550 mcm of natural gas. The withdrawal and injection capacity is directly dependent on the formation pressure and the total amount of gas in the storage facility. The minimum withdrawal capacity is 0.5 mcm/day and the maximum is 3.82 mcm/day. Where necessary, this capacity can be increased up to 4.7 mcm/day by means of forced (emergency) withdrawal. However, such emergency withdrawal is only possible when the gas storage is full and can be maintained for a period of up to 30 days.

ICGB AD is a joint investment company where Bulgarian Energy Holding EAD and IGI Poseidon S.A. (joint investment company with equal share of the Greek public gas corporation DEPA S.A. and the Italian group Edison International Holding N.V.) are shareholders with equal shares. ICGB AD is the operator of IGB and carries out the following activities:

- development, design, financing, management, construction, operation, maintenance and potential expansion of the IGB pipeline, as well as exercising ownership rights over it;
- administering natural gas transactions and organising the balancing of trade on the IGB pipeline in accordance with applicable laws;
- managing the transmission capacity of the IGB pipeline and concluding contracts for transmission through the pipeline;
- concluding agreements for the IGB interconnectivity with neighbouring facilities;
- participating in other activities in addition to the above.

The IGB pipeline was put into commercial operation on 1 October 2022. It connects the Greek gas transmission network near Komotini with the Bulgarian transmission network near Stara Zagora. IGB is also connected to the Trans-Adriatic Pipeline (TAP). The company carries out the natural gas transmission activity on the basis of a licence issued by the Energy and Water Regulatory Commission, which has a term of 35 years.

Bulgargaz EAD is a sole shareholder joint-stock company established in accordance with the Commerce Act under the jurisdiction of the Bulgarian Energy Holding EAD. Public supply of natural gas for the territory of the Republic of Bulgaria and natural gas trade are the activities carried out by the company on the basis of licences issued by the State Energy and Water Regulatory Commission. Bulgargaz EAD has a registration on the organized exchange market on the platform of Balkan Gas Hub EAD, Bulgarian Energy Trading Platform AD, Greek Gas Exchange (EnEx) and registration for trading in Slovakia and Serbia. The registration procedure of Bulgargaz EAD on the Hungarian and Romanian gas exchanges is currently underway. During the term of the license, Bulgargaz EAD shall exercise the rights and perform the obligations, as follows:

- conclude transactions with production companies and natural gas traders for gas purchase in quantities required to cover the consumption of the customers directly connected to the gas transmission network and as well as for the agreed quantities required for performing the activity of public providers;
- conclude transaction for natural gas sale with customers;
- conclude transactions for the storage of natural gas with storage facility operators;
- perform other necessary activities relating to the public supply of natural gas;
- ensure the continuous and high-quality supply of natural gas;
- not to refuse the conclusion of a contract for the sale of natural gas to a customer who is directly connected to the gas transmission network or to a public provider in accordance with the effective legislation.

c) Identification of the natural gas transmission and storage infrastructure, with the main entry and exit points of the gas transmission system, which is essential for the security of gas supply.

The physical infrastructure for natural gas transmission and storage in Bulgaria, with the main entry and exit points of the gas transmission system, enables natural gas transmission corridors to be established, both for domestic needs and for customers in other countries.

The natural gas transmission and storage infrastructure, with the main entry and exit points of the gas transmission system in Bulgaria, includes:

- the gas transmission system as a whole, including all main gas pipelines and compressor stations;
- the Chiren underground gas storage, together with all specialized underground and ground equipment required for gas injection and withdrawal and for preserving the quality of stored natural gas, and a compressor station with a total installed capacity of 9 MW;
- Entry-exit point GMS Chiren – connection between the gas transmission network and Chiren UGS.
- Interconnection point (IP) Negru Voda 1/Kardam – 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 Kardam, General Toshevo Municipality;
- Interconnection point (IP) Kulata/Sidirokastro – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by DESFA S.A. (Greece), located on the Bulgarian-Greek border in the area of Kulata village, Petrich Municipality;
- Interconnection point (IP) Strandzha/Malkoclar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by BOTAS (Türkiye), located on the Bulgarian-Turkish border in the area of the village of Strandzha, Bolyarovo Municipality;
- Interconnection point (IP) Strandzha 2/Malkoclar – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TAGTAS (Türkiye), located on the Bulgarian-Turkish border in the area of the village of Strandzha, Bolyarovo Municipality;
- Interconnection point (IP) Kyustendil/Zhidilovo – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by Nomagas

AD (former GA-MA, Macedonia), located on the Bulgarian-Macedonian border in the area of the village of Guyeshevo, Kyustendil Municipality.

- Interconnection point (IP) Ruse/Giurgiu – connection between Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TRANSGAZ S.A. (Romania) on the Bulgarian-Romanian border in the area of the village of Marten, Ruse Municipality;
- Interconnection point (IP) Stara Zagora – connection between Bulgartransgaz EAD gas transmission network and the gas pipeline (IGB) operated by ICGB AD (Bulgaria), located in the area of the village of Zagore, Stara Zagora Municipality;
- Interconnection point (IP) 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) Kalotina/Dimitrovgrad – connection between the gas transmission network of Transportgas (Serbia) and the gas transmission system operated by Bulgartransgaz EAD (Bulgaria), located on the Bulgarian-Serbian border in the area of the village of Kalotina, Dragoman Municipality.

d) Natural gas import sources

In the period 2019 and 2022, the natural gas quantities by sources of supply in Bulgaria were as follows:

Type of supply	2019	2019	2020	2020	2021	2021	2022	2022
	Qty, GWh	Share, %	Qty, GWh	Share, %	Qty, GWh	Share, %	Qty, GWh	Share, %
Natural gas supply to gas transmission networks, including:	**32,870**	**30.64%**	**31,337**	**45.11%**	**35,430**	**25.82%**	**28,203**	**17.24%**
Imported from Russia	**24,739**	**75.26%**	**23,602**	**75.32%**	**31,115**	**87.82%**	**12,903**	**45.75%**
Local production	**182**	**0.55%**	**326**	**1.04%**	**224**	**0.63%**	**71**	**0.25%**
Supplied through interconnection entry points	**7,949**	**24.18%**	**7,409**	**23.64%**	**4,090**	**11.54%**	**15,229**	**54.00%**
Supplied to cross-border points with neighbouring countries	**74,424**	**69.36%**	**38,137**	**54.89%**	**101,778**	**74.18%**	**135,391**	**82.76%**
TOTAL	**107,294**		**69,474**		**137,208**		**163,594**	

The global natural gas market suffered a major disruption in 2022 after Russia significantly cut pipeline supplies to Europe as a result of the war in Ukraine, leading to unprecedented pressure on supplies and triggering a global energy crisis. This has had a strong impact on natural gas prices, which have reached record high levels in the European Union and Bulgaria.

Due to the reduced Russian gas flows to Europe in 2022, significant quantities of pipeline gas and LNG were directed to European countries from alternative sources such as Norway, Algeria, USA, Qatar, Nigeria, etc. LNG terminals will continue to play a key role in enhancing European gas security.

e) Description of the role of storage of natural gas in Bulgaria

On the basis of a licence issued by SEWRC, Bulgartransgaz EAD provides natural gas storage services through its own underground gas storage facility Chiren UGS, which serves to cover seasonal fluctuations in consumption and ensure security of supply. 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 natural gas quantities injected into/withdrawn from the storage facility depend on the market conditions and on the optimal technical capacity of Chiren UGS, subject to compliance with the rules for operational safety and security.

Natural gas undertakings that supply natural gas to customers of uneven seasonal consumption (including district heating companies and final suppliers) are obliged to provide natural gas quantities to compensate for the fluctuation in consumption of their customers within 10% - 20% of the annual supply nominations of their customers.

Bulgartransgaz EAD is required to ensure that sufficient capacity is available for injecting and storing such quantities of natural gas with an indicative total volume of 290 mcm.

The seasonal fluctuation in supply is calculated by using a fluctuation factor (FF) as follows:

FF= Vs / Vw

Vs — sum of the quantities consumed in the previous calendar year for the months from April to September;

Vw — sum of the quantities consumed in the previous calendar year for the months from January to March and from October to December.

When FF is less than 0.6, supply is deemed to fluctuate, and in all other cases – to be even.

In order to verify the information under the concluded natural gas supply contracts with customers with seasonal fluctuations in consumption - the companies supplying natural gas to such customers are obliged to provide an excerpt of their contracts with deleted commercially sensitive information to Bulgartransgaz EAD, which in turns provides a report to the competent authority for the nominated storage and injection capacity of the companies according to the information received.

The development of interconnections with neighbouring countries and the provision of sufficient storage capacity, as well as the implementation of other priority projects, will enhance market integration, diversification and security of supply in the region and is a prerequisite for the Chiren UGS to play an increasingly important role in providing additional flexibility to the gas transmission systems at regional level, enabling better management of network congestion and seasonal optimisation of the use of gas transmission networks.

Storage capacity (total and working) compared to demand during the heating season

Chiren UGS has a total capacity of 1,300 mcm and a total working gas storage capacity of 550 mcm active gas. The remaining capacity of 750 mcm is reserved for buffer gas storage. The current capacity of the storage facility (active gas volume in energy units) is 5,889,762 MWh at gross calorific value of the natural gas of 10.71 MWh/1,000 m^3.

Chiren UGS expansion project aims to increase the active gas volume up to 1 bcm and the daily withdrawal and injection capacity up to 8-10 mcm/d. The increased capacity will ensure the security of natural gas supply and will contribute to enhancing competition and access to natural gas from alternative sources. In this way, the project will contribute to enhancing the liquidity of gas markets in Bulgaria and the region.

The quantities of natural gas withdrawn and injected and the relevant figures for 2019, 2020, 2021 and 2022 are set out in the table below.

Chiren UGS	**2019**	**2020**	**2021**	**2022**
	bcm	bcm	bcm	bcm
Injected quantity	0.410	0.362	0.37279	0.42656
Withdrawn quantity	0.358	0.41295	0.47021	0.24055
Average daily withdrawal for 1 month	0.0024	0.00207	0.00243	0.00174
Minimum average daily withdrawal for 1 month	0.00107	0.00126	0.00178	0.00084
Maximum average daily withdrawal for 1 month	0.00323	0.00261	0.00284	0.00255

Natural gas consumption in Bulgaria during the heating season (information on the total annual natural gas consumption in the country for the period 2019 to 2022 is provided in a) Main figures on natural gas consumption in Bulgaria of this Preventive Plan)

Consumption in Bulgaria during the heating season 2019-2020							
	October 19	**November 19**	**December 19**	**January 20**	**February 20**	**March 20**	**April 20**
mcm	180.7	256.0	330.0	365.1	318.6	300.0	230.2
GWh	1,918.8	2,715.4	3,494.8	3,863.1	3,358.4	3,163.0	2,425.0

Consumption in Bulgaria during the heating season 2020-2021							
	October 20	**November 20**	**December 20**	**January 21**	**February 21**	**March 21**	**April 21**
mcm	240.6	318.1	345.4	387.8	349.5	378.4	288.5
GWh	2,538.7	3,356.2	3,640.4	4,078.6	3,675.3	3,978.4	3,033.1

Consumption in Bulgaria during the heating season 2021-2022							
	October 201	**November 21**	**December 21**	**January 22**	**February 22**	**March 22**	**April 22**
mcm	228.9	273.0	352.8	381.7	301.3	330.4	208.7
GWh	2,410.8	2,880.5	3,718.8	4,025.1	3,179.7	3,494.1	2,209.8

Consumption in Bulgaria during the heating season 2022-2023							
	October 22	**November 22**	**December 22**	**January 23**	**February 23**	**March 23**	**April 23**
mcm	137.4	217.5	270.2	254.9	247.7	257.2	209.5
GWh	1,466.4	2,336.2	2,926.1	2,765.2	2,675.5	2,780.6	2,266.4

Description of the role of the natural gas storage facilities in Bulgarian relevant for the risk group.

The main parameters of Chiren UGS during the period 2022-2023 (winter cycle), including cross-border access, are set out in the table below.

Cross-border access	Volume (MSm^3)		Withdrawal capacity (MSm^3/d)			
	Reserve *	Available firm commercial capacity	Initial	At 50% filling	At 20% filling	At 10% filling
Allowed and used	290	250	3.82***	3.6	2.6	2.3

* Capacity to ensure the security of supplies for consumers and maintain balance.

** Withdrawal capacity (MSm3/d) at 100% capacity of Chiren UGS

MSm^3/d — million standard cubic metres (conditions - T=20°C and P=1,01325 bar(a)) gas per day (24 hours).

Maximum daily withdrawal capacity at different fill levels

The daily withdrawal capacity of the gas reservoir depends directly on the current formation pressure in the underground gas reservoir and the degree of filling. Where necessary, this capacity can be increased up to 4.7 mcm/day by means of forced (emergency) withdrawal. However, such emergency withdrawal is only possible when the gas storage is full and can be maintained for a period of up to 30 days.

Withdrawal and injection capacity of the Chiren gas storage facility

Capacity	Injection	Injection	Withdrawal	Withdrawal
daily	mcm/day	MWh/day	mcm/day	MWh/day
Maximum	3.85	41,228	3.82 /4.7*	40,907 / 50,330*
Minimum	0.5	5,354	0.5	5,354

The gas volume in energy units has been calculated at gross calorific value of the natural gas of 10.71 MWh/1,000m^3.

* Maximum capacity for withdrawal in forced (emergency) mode.

The capacity for withdrawal and injection is directly dependent on the formation pressure and the total amount of gas in storage.

f) Description of the role of domestic production in Bulgaria

Natural gas production is carried out by Oil and Gas Exploration and Production Plc. and Petroceltic Bulgaria EOOD. Petroceltic Bulgaria EOOD carries out natural gas local production from Galata, Kaliakra and Kavarna fields, for which Bulgartransgaz EAD provides access to the gas transmission network at the entry point GMS Galata.

The company Oil and Gas Exploration and Production Plc. is a public company, which is a concessionaire under thirteen concession contracts for production of crude oil and/or natural gas and uses the entry point GMS Dolni Dabnik for connection to the gas transmission network.

The current exploitation of the country's gas fields is limited and is not expected to have a significant increase in production in the future. However, future production may increase considering the ongoing exploration activities, including in the Black Sea waters.

For the period 2019 to 2022, Petroceltic and Oil and Gas Exploration and Production Plc. have produced the following natural gas quantities:

Year	**2019**	**2020**	**2021**	**2022**
	bcm	bcm	bcm	bcm
Domestic production – total	**0.017**	**0.045**	**0.021**	**0.010**

As can be seen from the data in the table above, the quantities of domestically produced natural gas are insignificant and on a declining trend, therefore the quantities to satisfy domestic consumers are from external sources.

g) The role of natural gas in the production of electricity in Bulgaria. (capacity for electricity production from gas, including for combined electricity production (total in MW) and as a percentage of the total production capacity.

In the Republic of Bulgaria, natural gas is used for production of electricity mainly in highly efficient combined heat and power plants (CHP) - cogeneration plants, which as of 2023 have a total installed capacity of 1209 MWe.

The largest thermal power plants operating with natural gas are:

- Toplofikacia Sofia EAD - District heating company (DHC) Sofia and DHC Sofia Iztok - a total of 239 MWe;
- EVN Bulgaria Toplofikacia EAD – a total of 80 MWe;
- Veolia Energy Varna EAD - a total 11.22 MWe;
- Toplofikacia-Burgas EAD - a total 17.82 MWe;
- Toplofikacia-Pleven EAD - a total of 68 MWe;
- Toplofikacia Pernik AD - gas cogenerators - 20.91 MWe;
- Biovet - 18 MWe;
- Toplofikacia-Vratsa EAD - a total of 8.24 MWe;
- Toplofikacia - Razgrad EAD - 3.014 MWe;
- Toplofikacia Veliko Tarnovo AD - 2.81 MWe.

Electric power production in Bulgaria can also generated at TPP Varna - a condensation plant of 630 MWe total installed electric power, which, however, did not operate in 2023.

The total electricity production of thermal power plants in the Republic of Bulgaria, operating with main fuel natural gas for 2022 was 4.87%, which marks a decrease of 2.17% compared to 2021.

The natural gas quantities for electric power and heat generation in Bulgaria in the period 2019–2022, in bcm/y, are shown in the table below:

Type of generation	2019	2020	2021	2022
	bcm/y	bcm/y	bcm/y	bcm/y
Natural gas for electric power generation	0.362	0.402	0.615	0.344
Natural gas for heat generation	0.721	0.727	0.793	0.655
Total:	**1.083**	**1.129**	**1.408**	**0.999**

In 2022 the complicated gas market situation in Europe due to Russia's military invasion in Ukraine and the subsequent actions of Gazprom Export LLC caused interruption of Russian natural gas supplies to a number of countries.

On April 27, 2022, Russia unilaterally stopped supplies to the public natural gas supplier in Bulgaria in response to our country's refusal to agree to Russia's request gas supplies to be paid for in roubles. The interruption of natural gas supplies did not significantly affect the domestic electricity market, given the low percentage of production capacity using natural gas. However, the exclusion of heat sources operating with natural gas and providing district heating in cities would force citizens to replace this type of energy with electricity, which in turn could lead to overloading and even disconnection of large parts of the electricity distribution network in certain cities of the country.

h) Role of energy efficiency measures and their impact on the annual final gas consumption in Bulgaria.

In the Republic of Bulgaria, there is legislation governing the policy in the field of energy efficiency, based on which the entities are obliged to implement measures to increase energy efficiency. The main regulatory document in the field of energy efficiency is the Energy Efficiency Act (EEA). The purpose of the act is to significantly contribute to achieve the national energy efficiency objectives, thus actively involving the country in the efforts of the European Union to implement the community's common goal for 2030. To support the implementation of the national energy efficiency goal by 31 December 2030, a new scheme for energy savings obligations is introduced, as well as alternative measures to ensure the achievement of a common cumulative target for energy savings in the final energy consumption for the period from 1 January 2021 until 31 December 2030. The difference between the total cumulative target and the estimated energy savings from implementation of the alternative measures will be distributed as individual energy savings targets among the following obliged persons:

1. final suppliers, suppliers of last resort, traders with an issued license for "electricity trading" activity, who sell electric power to final customers over 20 GWh per year;
2. heat transmission companies and heat energy suppliers that sell heat energy to final customers over 20 GWh per year;
3. final suppliers and natural gas traders that sell to final customers more than 1 million cubic meters per year;
4. liquid fuels traders that sell to final customers more than 500 tons of liquid fuels per year;
5. solid fuel traders that sell to final customers more than 13 thousand tons of solid fuels per year.

The scope of the current inspection regime of heating and air conditioning systems has been expanded to include the combined heating and ventilation systems. A requirement has been

introduced for public service buildings in operation of more than 250 sq m total floor area with heating installations or with combined heating and ventilation systems of more than 290 kW useful rated power for heating or cooling of premises are to be equipped with building automation and control systems where technically and economically feasible.

Energy efficiency measures that public sector entities can use are included in the EEA and the secondary legislation in the field of energy efficiency. Large undertakings are obliged to carry out energy audits at intervals of four years.

The measures provided for in the regulations are the basis for the energy efficiency improvement mechanisms and, given their specificity, in practice they have an impact on the final annual consumption of natural gas. On the one hand, improvements and modernizations carried out regarding equipment and installations using natural gas in industrial and/or energy processes limit final consumption - improve efficiency, and on the other hand, measures related to changing the type of fuel used (for example use of cogeneration, local natural gas-fired systems instead of solid fuel-fired boilers) will increase annual natural gas consumption. However, in order to ensure the security of gas supplies in the Union and in compliance with Council Regulation (EU) 2022/1369 of August 5, 2022, our country will continue to undertake additional measures to reduce gas demand by 15 %, as required by the Regulation.

2. Risk assessment summary

In accordance with Article 7 and pursuant to the requirements of Annex V of Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No. 994/2010, the Republic of Bulgaria updated its National Risk Assessment in 2023.

The results of the prepared National Risk Assessment for the security of natural gas supply are as follows:

a) a list of the scenarios assessed and a brief description of the assumptions applied for each one as well as the risks/shortcomings identified:

The criteria used to determine whether a system is exposed to a high/unacceptable risk are those indicated in the attached Risk Severity Table proposed by the Joint Research Centre (JRC) of the European Commission. The table defines five levels of risk probability. The risks in green have the lowest probability of occurring and those in red are the unacceptable risks that may trigger a crisis and must therefore be prevented. Each risk factor has been assessed on the basis of criteria that are specific to the risk concerned. For this reason, the overall picture regarding the impact of each factor is exceedingly complex and dynamic. Nevertheless, having it in place may help gas supply security experts gain better understanding.

	АКТИВИ	Газова инфраструктура						ICT/Система за		Сгради			Служители
	Източник на риска	Компресорна станция	Вход/изход (from/to Countries)	Място на производ ство	Подземно газово хранилище	LNG Терминал	Тръбопровод	Система за контрол на процесите	Система за обмен на данни	Администр ативна сграда	Регионален център за поддръжка	Център за контрол на газовия поток	Работници
Технологични - 15 бр.	Експлозия - 1					NA							
	Пожари (вътрешен за дадено съоръжение) - 1					NA							
	Изтичане на газ - 2					NA							
	Човешки грешки - 1					NA							
	Наводнения (вътрешно събитие, теч, водещ до наводнение) - 1					NA							
	Неизправност или стареене на оборудването (неуспех при стартиране, отказ по време на работа, вътрешна корозия, механично износване и др.) - 2					NA							
	Липса на електроенергия (или друг енергиен източник) - 1					NA							
	Неизправност на ИКТ (повреда на хардуера, грешка в софтуера, интернет, проблеми с SCADA и т.н.) - 1					NA							
	Кибератака - 2					NA							
	Нанесени поражения в резултат на изкопни работи (копаене, пробиване), наземни работи и др. - 2					NA							
	Липса на адекватна поддръжка на газопреносната мрежа - 2					NA							
	Използване на остарели технологии - 2					NA							
	Липса на резервни части - 2					NA	NA						
	Замърсяване на въздуха поради авария в близко съоръжение(химическо, ядрено) - 1					NA							
	Въздействие на въздухоплавателно средство - 1					NA							
	Друго (уточнете):.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Политически - 4 бр.	Политически вълнения (в страната на добив, или в транзитна страна) - 3					NA							
	Война/гражданска война (в страна на добив или в транзитна страна) - 3					NA							
	Тероризъм - 4					NA							
	Прекъсване на газа в трети страни поради различни причини - 2					NA							
	Друго(уточнете):.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Търговски/лазарен/ финансов - 6 бр.	Споразумения с доставчици от трети държави - 2					NA							
	Търговски спорове - 2					NA							
	Нестабилност на цените - 4 (първи сценарий)					NA							
	Нестабилност на цените - 5 (втори сценарий)												
	Недостатъчни инвестиции - 1					NA							
	Внезапно, неочаквано върхово потребление - 2					NA							
	Контрол на инфраструктурата, важна за сигурността на доставките от субекти от трети страни - 2					NA							
	Друго(уточнете):.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Социални - 7 бр.	Стачки (в различни свързани сектори, като газовия сектор, пристанищата, транспорта и т.н.) - 1					NA	NA						
	Саботажи - 1					NA							
	Обществено противопоставяне на съоръжения/инвестиции - 2					NA							
	Липса на персонал (слабо населени райони, застаряващо население, неподходяща специална подготовка, аварии и т.н.) - 1					NA							
	Пандемия - 2					NA							
	Вандализъм - 1					NA							
	Кражби - 1					NA							
Природни - 7 бр.	Земетресения - 2					NA							
	Наводнения (силен дъжд, речни разливи и др.) - 2					NA							
	Свлачища - 1					NA							
	Бури (на сушата, в морето) - 1					NA							
	Лавини - 1					NA							
	Екстремни метеорологични условия(екстремно ниски температури, екстремно високи температури) - 2					NA							
	Пожари (външни за съоръжението, като околни гори, тревни площи и др.) - 2					NA							
	Друго (уточнете):.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

freq.	
	1
	2
	3
	4
	5

The conducted national risk assessment covers 5 main groups of risk factors, depending on their source (political, technological, social, commercial/market/financial risks and natural risks). Threats can arise from acts, omissions or natural phenomena. A total of **39 types of various specific risks** at group level which may affect the security of natural gas supply were identified during the course of the assessment. The largest group consists of **technological risks - (15)** followed by social ones (7) and natural risks (7). Some of them present a threat to the functioning of all elements of gas infrastructure while the impact of others might be local or limited to individual system components. The most vulnerable gas transmission system elements are the compressor stations, interconnectors entry/exit points, underground gas storage, pipelines, gas flow control centre, etc. Most of the risks have a probability of occurrence in the range of very low to low (1-2) and cover various elements of the gas infrastructure. While a single risk does not present a major threat in itself, several different risks materialising at the same time may cause the situation to rapidly deteriorate and lead to disruptions in supply.

In the assessment, **2 risk factors** were identified, assessed as imposing a high level of threat **(4)**, and in one case, under certain conditions, a very high level of threat is possible **(5), 2 risk factors** were assessed with a probability of occurrence **(3)** and **17 risk factors** that have a very low level of threat and the probability of their occurrence is **low (1)**. The impact of this group of risks is mostly local and does not present a long-lasting threat to the security of supply. The consequences of such risks can usually be overcome by the relevant system operators at national level.

A significant part of the **risks 18** pose a low level of threat and probability of occurrence **(2)**. In most cases, when these risk factors occur independently, they do have the potential to affect gas infrastructure but their adverse consequences are not expected to lead to long-lasting disruptions in supply. However, complications may arise in a situation of such risks getting out of control, particularly in combination with other adverse circumstances. These risks have the potential to escalate to a higher threat level and, in combination with some other risks, can quickly cause cascading effects in the system leading to unpredictable supply consequences. The combination of the impact of one or several risks at the same time in a certain country can lead to an interruption of gas supplies for a period of a week up to several weeks, both for the country and for the countries of the risk group. It will also affect protected customers and may partly affect the interruptible market, export, electricity cogeneration, partly with industrial demand. In such a scenario, non-market-based measures will be required in order to safeguard protected customers. Such measures will have to be continually monitored by teams on duty in order to prevent abrupt escalation of risk situations and difficulties in addressing their consequences.

The military aggression of the Russian Federation against Ukraine put energy security in Europe at risk, and therefore ENTSOG carried out an additional assessment of the dependence of EU Member States on Russian supplies in the summer of 2023 and the winter of 2023/24. According to the published in April 2023 by ENTSOG Summer Supply Outlook with winter 2023/24 overview[3], an assessment was made of the readiness of the gas infrastructure of the EU Member States to cope with the challenges of various scenarios.

ENTSOG assessment concluded that high gas storage stocks during the winter season play an essential role in ensuring security of supply and also provide the necessary seasonal flexibility. Considering the security of supply, it would be important that natural gas injected into the storages during the summer season is maintained at an adequate level until the end of winter.

The maintenance of the existing gas infrastructure in good technical condition and the construction of new routes for interconnection of the gas transmission networks between individual countries in Europe are the basis to effectively reduce the EU Member States dependence on supplies of Russian natural gas.

The results of the simulation show that even in the event of complete interruption of natural gas supplies from Russia in winter, by the introduction of appropriate measures by EU Member States such as: increasing the amount of natural gas stored in storages, providing additional alternative supplies of natural gas and reducing gas consumption in the period from April 1, 2023 to March 31, 2024 by at least 15% compared to the average gas consumption for the same period of the last five years (voluntary demand reduction), the normal heating supply of EU citizens in winter will be guaranteed.

b) Main conclusions of the National risk assessment

The national risk assessment for natural gas supplies in Bulgaria shows that no risks have been identified leading directly to significant, severe or catastrophic consequences due to interruption of supplies on the territory of Bulgaria, but under certain circumstances their occurrence is possible. The main part of the risks in terms of probability and destructiveness are of low probability of occurrence and of low destructive power, especially since gas supplies to our country are ensured through the southern gas corridor and do not depend on Russia and Ukraine. Their impact remains within individual elements of the gas infrastructure and, if

[3] https://www.entsog.eu/sites/default/files/2023-04/SO0045-23_Summer%20Supply%20Outlook%202023%20with%20Winter%202023-24%20Overview.pdf

they occur, will not significantly affect supplies to other countries in the risk group and protected customers.

Currently, the highest and most constant among all risks remain those related to and depending on the international political situation that may lead to significant instability of natural gas prices, as a result of the ongoing war between Russia and Ukraine.

The analyses show that by implementation of the projects for interconnecting the Bulgarian gas infrastructure with that of the neighbouring countries, Bulgaria fulfils the infrastructure standard according to the N-1 formula at the national level.

3. Infrastructure Standard (Article 5)

Definition of the formula N – 1

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

Gas infrastructure shall cover the gas transmission network including interconnections, as well as production, LNG and storage facilities connected to the calculated area.

The technical capacity of all remaining available gas infrastructure in the event of disruption of the single largest gas infrastructure shall be at least equal to the sum of the total daily gas demand of the calculated area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.

The results of the N – 1 formula, as calculated below, shall be at least equal to 100 %.

3.1. National level

Identification of the single largest gas infrastructure

Since 1 January 2020, the single largest gas infrastructure supplying gas to cover domestic demand in Bulgaria was the gas pipeline with entry point IP Strandzha 2/Malkoclar connecting Bulgartransgaz EAD gas transmission network and the gas transmission system operated by TAGTAS (Türkiye), with maximum permanent transmission capacity of 54.6 mcm/day on the Bulgarian side.

c) Calculation of the N – 1 formula at national level

The calculation of the N-1 standard was prepared for the period 2023-2027 according to Article 5 of Regulation (EU) No. 2017/1938 concerning measures to safeguard security of gas supply and repealing Regulation (EU) 994/2010.

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

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

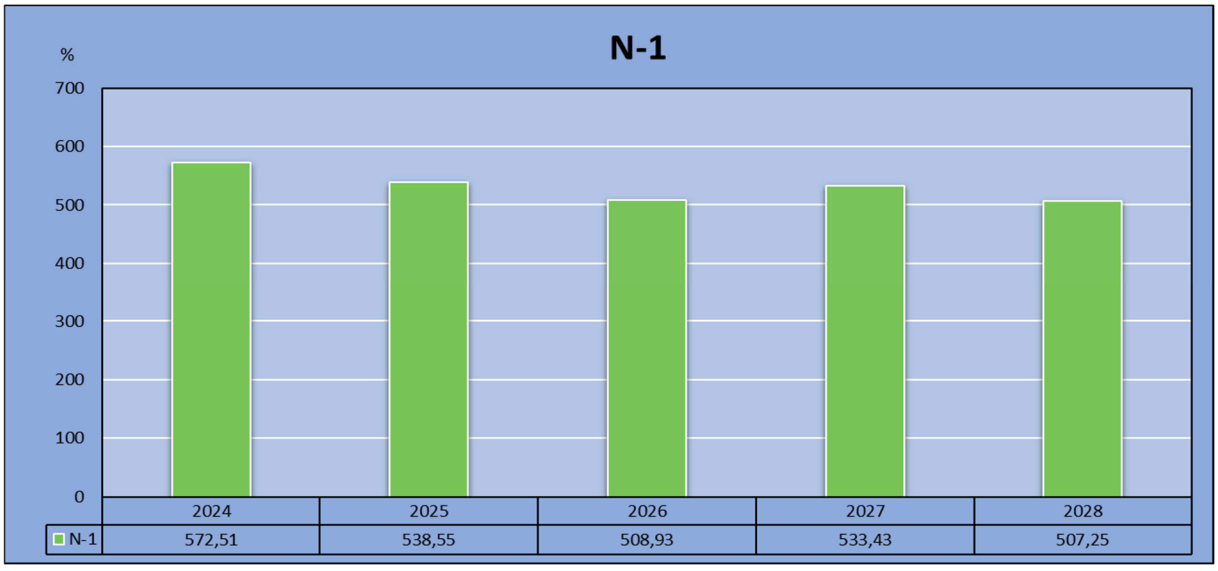
, where:

EP1	Technical capacity of IP Strandzha 2/Malkoclar, mcm/d
EP_2	Technical capacity of GMS Negru Voda 1/Kardam, mcm/d
EP_3	Technical capacity of the Interconnector Bulgaria-Serbia, mcm/d

EP_4	Technical capacity of IP Kulata/Sidirokastro, mcm/d
EP_5	Technical capacity of IP Ruse/Giurgiu (IBR), mcm/d
EP_6	Technical capacity of the Interconnector Greece-Bulgaria (IGB), mcm/d
EP_7	Technical capacity of IP Kireevo/Zaycar, mcm/d
EP_8	Technical capacity of IP Strandzha/Malkoclar, mcm/d
LNGm	Maximum technical capacity of the LNG facilities
Smax	Withdrawal from Chiren UGS – 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, as calculated for the next 5 years, are as follows (capacity figures in the N – 1 formula are expressed in mcm/day as required by the Regulation):

Година	Pmax	Smax	EP2	EP3	EP4	EP5	EP6	EP7	EP8	Dmax	LNGmax	Ep1=Imax	N-1
						mcm/d							%
2024	0,03	4,70	20,27	0,72	6,12	4,11	9,13	32,00	11,00	15,38	0,00	54,60	572,51
2025	0,03	5,40	20,27	0,72	6,12	4,11	9,13	32,00	11,00	16,48	0,00	54,60	538,55
2026	0,03	6,10	20,27	0,72	6,12	4,11	9,13	32,00	11,00	17,58	0,00	54,60	508,93
2027	0,03	6,80	20,27	0,72	9,50	4,11	15,22	32,00	11,00	18,68	0,00	54,60	533,43
2028	0,03	7,50	20,27	0,72	9,50	4,11	15,22	32,00	11,00	19,78	0,00	54,60	507,25



The calculations made by the formula N-1 for the infrastructure standard show that in case of disruption of the single largest gas infrastructure, the capacity of the other existing infrastructure will be able to ensure the necessary gas quantities to satisfy the overall gas

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

In order to ensure that Bulgaria meets the infrastructure standard, several main projects are currently under way, such as projects for construction of new interconnectors with the neighbouring countries and capacity increase at the existing points, UGS Chiren expansion project and/or project for construction of a new gas storage, new projects providing entry capacity, etc.

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

4. Compliance with the supply standard

The competent authority requires natural gas undertakings that it identifies, to take measures to ensure the gas supply to protected customers of the Member State in the event of:

a) extreme temperatures a during a 7-day peak period occurring with a statistical probability once in 20 years;
b) any period of at 30 days of exceptionally high gas demand occurring with a statistical probability once in 20 years;
c) for a period of 30 days in the event of disruption of the single largest gas infrastructure under statistically average winter conditions.

The obligations imposed on natural gas undertakings to meet the gas supply standards set out in this Article shall be applied without discrimination and shall not entail an undue burden on such undertakings.

The competent authority ensure that conditions for supplies to protected customers are established without prejudice to the proper functioning of the internal energy market and at a price respecting the market value of the supplies. The measures are intended to ensure uninterrupted supply, under very difficult conditions, to protected customers, as well as implementation of measures to mitigate the impact of an emergency.

Any new non-market measures intended to guarantee compliance with the gas supply standard should be in accordance with the procedure set out in Article 9, paragraphs 4-9 of Regulation (EU) 2017/1938.

The competent authority shall make public any measure not already included in the preventive action plan and notify the Commission of the description of any such measure and its impact on the national gas market and, as far as possible, the gas markets of other Member States.

a) Protected customers in the Republic of Bulgaria

Protected customers in Bulgaria are those described in Regulation (EU) 2017/1938, namely household customers connected to a gas distribution network; small or medium-sized enterprises; each district heating installation insofar as it delivers heating to household customers, provided that the installation is not able to switch to fuels other than gas (for example electricity cogeneration plants using gas turbines and/or piston engines); all public services, including hospitals, homes for the elderly, prisons, schools and other public infrastructures, public and private, providing accredited nursing services and activities, and civil and non-civil sector customers with consumption that does not exceed 0.05 mcm/year.

Solidarity protected customers in Bulgaria according to Regulation 2017/1938 shall be households (household customers) connected to a gas distribution network, healthcare,

services related to essential social care, emergency services, security services and district heating installations, in so far as they deliver heating to household customers, provided that such installations are not able to switch to other fuels than gas (e.g. heating and power cogeneration producers using gas turbines and/or piston engines).

b) Assessment of the total consumption of protected customers within the period 2019-2022 is shown in the table below:

	Quantity (bcm)			
	2019	**2020**	**2021**	**2022**
Total gas consumption	2.8	2.4	3.3	2.9
Protected customers consumption	0.50	0.54	0.58	0.47
Percentage of total consumption	17.86 %	22.50 %	17.58%	16.21%

Customers	**2019 mcm**	**2020 mcm**	**2021 mcm**	**2022 mcm**
Households	101.048	122.676	143.811	109.678
Non-households protected customers *	403.584	412.831	438.577	359.917
Total protected	504.632	535.507	582.388	469.596
Total annual gas consumption in Bulgaria	2,786	2,404	3,298	2,922

* consumption related to the activities referred to in Article 2, item 5, (a), (b) and (c) of Regulation (EU) 2017/1938.

Customers	**2019, number of customers**	**2020, number of customers**	**2021, number of customers**	**2022, number of customers**
Household	101,050	112,656	127,056	128,827
Non-households protected customers*	6,894	7,032	7,597	7,442
Total protected	107,944	119,688	134,653	136,269

According to the approach adopted by the Republic of Bulgaria, district heating companies operating with natural gas as main fuel, with only part of their facilities being able to switch to an alternative fuel, shall not be included in the scope of protected customers. Minimum natural gas quantities shall be envisaged for them according to the Preventive Plan to ensure the secure and reliable operation of the heat generation and transmission facilities. The envisaged minimum natural gas quantities for the district heating companies with alternative fuel shall represent only 8% of the total natural gas consumption during normal operation and are technologically necessary as the alternative fuel used in the Republic of Bulgaria for district heating companies is fuel oil (heavy fuel oil).

The technological process of switching to and operating with this type of fuel requires the use of certain minimum natural gas quantities, necessary to ignite the alternative fuel and to stabilise the combustion process in order to fully burn the alternative fuel oil. The presence of certain minimum amounts of natural gas in the combustion process results in a more efficient combustion of the alternative fuel used. This in turn significantly reduces the release of harmful emissions into the atmosphere, which contributes to protection of the environment, including the population's life and health.

In accordance with the environmental legislation for large combustion plants with an installed capacity of more than 50 MW, such as the majority of the district heating plants in the country, there is a time limit on the operation of alternative fuel oil, namely no more than 10 calendar days within 12 months.

Apart from this, there are district (local) heating plants in the Republic of Bulgaria for production of heat only, which supply mainly household customers. The technological scheme of these plants includes gas boiler installations for production of steam necessary for heating of the back-up fuel - fuel oil. Therefore, minimum natural gas quantities are also provided for these installations. A complete disruption of the natural gas supply to these installations would inevitably lead to a disruption of the installation's production regime and the cessation of heat production for household consumers.

Heat production installations, including cogeneration, are of strategic importance for energy security in Bulgaria and their decommissioning would lead to an energy crisis in the country. In the event that gas supply to these companies is completely cut off and they cease operation, their customers (predominantly households) will, for objective reasons, have to switch to another alternative source of heating, which will in practice be electricity. This is confirmed by the fact that a large part of the panel residential buildings in the country (built in the largest Bulgarian cities) are designed to be heated by district heating and not all residential premises have chimney outlets. Excessive consumption of electricity will lead to an imbalance of the electricity system, which may cause its collapse.

In this respect, the Bulgarian Emergency Plan envisages district heating companies to switch to alternative fuels, explicitly indicating that the restriction of gas supply shall be done without jeopardising the safe and reliable operation of the heat production and transmission facilities, i.e. the heat supply service to protected household consumers, including children, health and educational establishments. The Plan requires all district heating companies to declare the timing of their switchover to alternative fuels and the minimum quantities of natural gas they require to ensure the operational reliability and security of their production installations.

5. Preventive measures

In developing the preventive action plan and the emergency plan, the Ministry of Energy considers the contribution of the following indicative and non-exhaustive list of measures only in the event of an emergency:

5.1. Measures to maintain a technically sound and reliable infrastructure

In their capacity as operators of the Bulgarian gas transmission system, Bulgartransgaz EAD and ICGB AD operate, maintain and develop the national gas transmission infrastructure. Pursuant to the statutory requirements for the activities concerned, the transmission system operators are required to develop the network in line with long-term forecasts and plans for development of gas supply and beyond them, when this is economically justified.

Providing and maintaining a trouble free, reliable and efficient main and auxiliary gas infrastructure is a guarantee for the secure and high quality performance of services of natural gas transmission and storage in the country. In connection with this, the following activities are performed on a regular basis:

- Scheduled inspections, preventive and routine maintenance of the technological equipment and facilities in accordance with the requirements laid down in the Regulation on the structure and safe operation of transmission and distribution gas pipelines, gas equipment, installations and devices and following the manufacturers' instructions for the equipment;
- inspections, repairs and diagnostics of the technological equipment and components of compressor stations on an ongoing basis;
- In-line inspections and routine repairs of gas pipelines;
- Strength and tightness retests of gas pipeline sections and equipment thereto;
- Inspections along the gas pipelines' route to detect erosion, landslides, gas leakages, unauthorised construction works and other activities performed within the gas pipeline easement, etc. and risk zone monitoring;
- anti-erosion and hydrological activities;
- Monitoring of cathodic protection;
- Verifications, tests of metering lines, GRS and AGRS;
- Maintenance of emergency reserve of pipes and provision of spare parts for the technological equipment – gas turbine compressor units, control systems, instrumentation, etc.

The implementation of the above measures helps prevent or reduce the impact of some of the main technological risk factors depending on their origin — technological, social, natural, political, commercial, and threats caused by human acts or omissions. The measures are intended to counter most of the risks identified in the National Risk Assessment (NRA), various specific risks which may affect the security of natural gas supply. Some of them present a threat to the functioning of all gas infrastructure elements while the impact of others is local or limited to individual system components.

The most threatened elements of the gas transmission system are compressor stations, interconnection points, underground gas storage, pipelines, gas flow control centre, etc., which affects both customers and regional supplies for the countries of the risk group. Although most risks have a very low to low probability of occurring (1-2), they may have an impact on various elements of the gas infrastructure. While a single risk does not present a major threat in itself, several different risks materialising at the same time may cause the situation to rapidly deteriorate and lead to disruptions in supply. The implementation of the measures planned ensures a relatively low level of threat for this group. The implemented preventive measures have a primarily national dimension. By guaranteeing the secure operation of the national gas transmission and distribution network, we are able to have a positive influence on a regional level as well. The measures ensure stability of natural gas supply to all customers and thus have a positive impact on the national and regional economy. The reliable functioning of the system enables efficient and effective use of domestic energy

resources and prevent any harmful consequences for workers and employees in the energy industry and for customers reliant on sustainable natural gas supplies.

5.2. Measures to enhance interconnections between neighbouring Member States

Representatives of the gas companies - Bulgartransgaz EAD (Bulgaria), ICGB AD (Bulgaria), DESFA S.A. (Greece), FGSZ LTD (Hungary), SNTGN TRANSGAZ S.A. (Romania) and Gastrade S.A. had signed a Memorandum of Understanding on implementation of the Vertical Gas Corridor. The document was signed on December 1, 2022 in Athens, Greece and aims to establish a framework for cooperation between the gas companies for implementation of a project for South-North bi-directional natural gas transmission corridor connecting the gas transmission networks of Bulgaria, Greece, Romania and Hungary. The promotion of projects of common interest, as well as other necessary projects to be performed jointly and individually, are among the goals recorded in the Memorandum for implementation of the Vertical Gas Corridor. The memorandum will serve as a basis for strengthening cooperation with a view to analysing the possibility to construct the necessary gas transmission system that will enable natural gas transmission to the EU market from Greece via Bulgaria, Romania, Hungary and in the opposite direction.

In October 2022, at Bulgartransgaz EAD suggestion, the Solidarity Ring (STRING) initiative was proposed, jointly with Transgaz S.A. (Romania), FGSZ Ltd. (Hungary) and Eustream a.s. (Slovakia) for natural gas transmission through the integrated gas transmission networks to provide an alternative route for gas supplies in sufficiently large volumes through the operators' existing networks. In short terms and with minimal improvements to the existing infrastructure, the project could transport up to 5 bcm of natural gas per year from Turkey and Greece to Eastern, Central and Western Europe through the territory of Bulgaria, Romania, Hungary and Slovakia, and could increase up to 20 bcm per year in the future.

5.3. Other measures adopted for reasons other than the risk assessment but with a positive impact on the security of natural gas supply to Bulgaria and the risk groups in which it participates

The ongoing project of Chiren UGS expansion aims to increase the active gas volume up to 1 bcm and increase the daily withdrawal and injection capacity up to 8-10 mcm/d. The increased capacity will ensure the security of natural gas supply and will contribute to enhancing competition and access to natural gas from alternative sources. In this way, the project will contribute to enhancing the liquidity of gas markets in Bulgaria and the region. Infrastructure commissioning at stages is planned to be completed by the end of 2024.

Chiren UGS expansion 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.

5.4. Measures of voluntary reduction of gas demand

Pursuant to Regulation (EU) 2022/1369 of August 5, 2022 on coordinated demand-reduction measures for gas, the Republic of Bulgaria is making all possible efforts to reduce its gas consumption in the period from April 1, 2023 until March 31 2024 by at least 15% compared to its average gas consumption in the period from 1 April 2017 until 31 March 2022 ("voluntary demand reduction").

The measures are clearly defined, transparent, proportionate, non-discriminatory and verifiable. In the selection of measures, the principles laid down in Regulation (EU) 2017/1938 were taken into account, so that:

a) do not unnecessarily distort competition or the proper functioning of the internal gas market;

b) do not threaten the security of gas supplies to other Member States or the Union;

c) comply with the provisions of Regulation (EU) 2017/1938 regarding protected customers.

When the Council declared a state of alert in the European Union[4], in accordance with Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas (Regulation 2022/1369), the Republic of Bulgaria reduced its gas consumption ("mandatory demand reduction"). As long as an alert is declared in the Union, gas consumption in the period from 1 April 2023 until 31 March 2024 (the "reduction period") must be 15% lower than the reference gas consumption in the country[5].

Any reduction in demand achieved by the country during the pre-alert period in the Union shall be taken into account for the purposes of mandatory demand reduction.

Upon decision-making to take measures to reduce gas demand, priority shall be given to those related to reducing gas consumption in the electricity sector, to encourage fuel switch in the industry, national awareness-raising campaigns, and targeted obligations to reduce heating and cooling, promote switching to other fuels and reduce consumption by industry.

5.5. Measures related to the mandatory fulfilment of the filling targets and filling schedules of Chiren UGS

In order to guarantee the needs of all European consumers, the European Parliament and the Council adopted EU Regulation 2022/1032 of June 29, 2022 amending Regulation 2017/1038 to safeguard security of natural gas supply. It imposes obligations on Member States regarding the minimum level of filling of the underground gas storages, that by the end of October 2022 was envisaged to be 80% of their operating capacity, and as of 2023 - 90%.

For 2023 and the subsequent years, the Republic of Bulgaria shall submit to the European Commission (EC) by September 15 of the previous year a draft filling schedule with intermediate targets for February, May, July and September, including technical information in a summarized form for the underground gas storage facilities on its territory, directly related to its market zone. The filling schedule and intermediate targets are based on the average filling rate over the previous five years.

When, in any year, the Republic of Bulgaria cannot meet its filling target by November 1 due to specific technical characteristics of the gas storage, such as extremely low injection levels, the Competent authority shall inform the EC by November 1, indicating the reasons for the delay. Under the stated objective circumstances, the objective of filling the gas storage (90%) should be achieved by December 1.

The competent authority carries out continuous monitoring for compliance with the filling schedule and reports regularly to the Gas Coordination Group (GCG). If the filling rate of Chiren UGS is more than five percentage points lower than the level in the filling schedule, the competent authority immediately takes effective measures to increase the filling rate and informs the EC and the GCG about the measures taken.

In the event of a substantial and sustained deviation by the Republic of Bulgaria from the filling schedule, which threatens the achievement of the filling target or in case of a deviation from the filling target, the Commission, after consulting with the GCG and the relevant

[4]"Union alert" means a Union-specific crisis level, which should trigger a mandatory demand reduction, independently of national crisis levels pursuant to Article 11 paragraph 1 of Regulation (EU) 2017/1938;

[5]"reference gas consumption" means the volume of a Member State's average gas consumption during the reference period; for Member States where gas consumption increased at least by 8 % in the period from 1 April 2021 to 31 March 2022 compared to the average gas consumption during the reference period, "reference gas consumption" means only the volume of gas consumption in the period from 1 April 2021 until 31 March 2022;
"reference period" means the period from 1 April 2017 until 31 March 2022;

Member States, shall issue a recommendation to the Member State concerned or to the other Member States concerned regarding the measures to be taken immediately.

When within one month of receipt of the EC's recommendation, the deviation has not been significantly reduced, the Commission, after consultation with the GCG and the competent authority in the Republic of Bulgaria, decides as a last resort to require measures to be taken to effectively overcome the deviation, including, where appropriate, one or more of the measures provided for in Article 6(b)(1) of Regulation (EU) 2017/1938, or any other measure to ensure that the filling target is met.

The Energy and Water Regulation Commission in the Republic of Bulgaria, in coordination with the competent authority, takes all necessary measures, including the possible provision of financial incentives or compensations for market participants, in order to achieve the filling targets set according to Article 6(a) of the Regulation (EC) 2017/1938. Member States shall give priority to market-based measures in ensuring that the filling targets are met.

Necessary measures are limited to what is necessary to meet the filling schedules and filling targets. The measures are clearly defined, transparent, proportionate, non-discriminatory and verifiable. They shall not unduly distort competition or the proper functioning of the internal gas market, nor endanger the security of gas supplies to other Member States or to the Union.

The competent authority shall take all necessary measures to ensure the efficient use of the existing infrastructure at national and regional level for the purpose of the security of gas supply. These measures shall under no circumstances block or restrict the cross-border use of storage facilities or LNG facilities and shall not limit the cross-border transmission capacity allocated in accordance with Commission Regulation (EU) 2017/459.

When the above measures are taken by EWRC or the Minister of Energy, the principle of putting energy efficiency first is applied, while achieving the objectives of their respective measures in accordance with Regulation (EU) 2018/1999 of the European Parliament and of the Council.

In 2022 and 2023 in order to achieve the set goals for minimum filling level of the underground gas storages, in compliance with Regulation (EU) 2017/1938, the Republic of Bulgaria has applied only market measures.

Application of non-market-based measures

According to Annex VIII of Regulation (EU) 2017/1938, possible non-market-based measures are to be used only when market mechanisms alone can no longer ensure supplies, in particular for protected customers or to implement the solidarity measure with other countries members of the EU and only in cases of emergency are:

a) supply-side measures:
- use of strategic gas storage;
- enforced use of stocks of alternative fuels (e.g. in accordance with Council Directive 2009/119/EC;
- enforced use of electricity generated from sources other than gas;
- enforced increase of gas production levels;
- enforced storage withdrawal;

b) demand-side measures:
- various steps of compulsory demand reduction including;
- enforced fuel switching;
- enforced utilisation of interruptible contracts, where not fully utilised as part of market-based measures,
- enforced firm load shedding.

These measures shall be necessary, proportionate, non-discriminatory and for a given period of time (temporary).

The competent authority shall make public any measure which has not yet been included in the preventive action plan, and shall notify to the Commission the description of any such measure and of its impact on the national gas market and, to the extent possible, on the gas markets of other Member States.

The above list of non-market-based measures for the security of gas supply which shall be applied only in case of emergency as a supply-side measure is the use of strategic gas storage. Pursuant to the Regulation, "strategic gas storage" is an underground storage or part of an underground storage of non-liquefied natural gas which is purchased, managed and stored by transmission system operators, an entity designated by the Member States or an undertaking, and which may be released only after prior notification or public authority authorisation for release, and is generally released in case of:

a) a serious shortage of supply;
b) disruption of supply: or
c) a declaration of an emergency, as referred to in point (c) of Article 7(4).

6. Other measures and obligations (e.g. in connection with the safe operation of the system)

Pursuant to Ordinance No.11 of 10.06.2004 on fuel stocks, the power plants using natural gas as their main fuel are obliged to maintain stocks of alternative main fuel on their sites (fuel oil, gas oil), with which to continue their production activity in case of disruption of natural gas supplies. The amount of stocks shall be calculated by month, according to regulations approved by the Minister of Energy for a period of 15 months. In the event of a complete disruption of natural gas supplies, the alternative fuel stocks shall be capable of providing continuous operation of the plants for an average of 5 to 15 days, during which time the necessary activities for long-term supplies shall also be carried out, if necessary.

Ordinance No. 10 of 9 June 2004 provides for the procedure for introducing a restrictive regime, suspension or restriction of production or supply of electricity, heat and natural gas - (issued by the Minister of Energy and Energy Resources, published, OJ 63 of 20 July 2004 effective as of 20 July 2004).

The Ordinance stipulates that in contracts for the supply and/or transmission of natural gas to consumers, respectively the general terms and conditions determine the possible degrees of minimum required hourly consumption and minimum required exit pressure from a gas regulation and metering station, the maximum allowed time and frequency of disruption of natural gas supplies, type of back-up fuel and time to switch to back-up fuel in view of:

- preservation of the main production;
- preservation of the technological regime;
- preservation of the mode of operation of productions using natural gas as raw material;
- preservation of the equipment;
- ensuring the life and health of people and preventing the environmental pollution.

Natural gas users connected to the transmission network and industrial users connected to the distribution network shall prepare measures and technological schemes for different amounts of restriction at which they shall work when a restrictive regime is introduced. This includes, in addition to limiting the use of natural gas and maintaining stocks of alternative fuel to cope with critical situations.

Distribution network operators shall implement the conditions and schemes that ensure compliance with the introduced restrictive regime.

7. Infrastructure projects

In the context of the European objectives for establishment of an interconnected and single European gas market, the infrastructure development 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 development of the Southern Gas Corridor and the plans for gas infrastructure development in the region and Europe.

Key to market integration, diversification and provision of the possibility to transport additional quantities of natural gas to and through Bulgaria are the projects for the Expansion of Chiren UGS, the LNG terminal in Alexandroupolis, the Projects for the development of the infrastructure with the aim of increasing the transmission capacities from Greece to Bulgaria and from Bulgaria to Romania. These projects will contribute to safeguarding the natural gas supplies to the country and the region, creating at the same time real conditions to diversify the sources and the routes and enabling the transmission of additional natural gas quantities to and through Bulgaria.

In December 2023, the interconnection Bulgaria – Serbia (IBS) has been put into commercial operation. It is reversible and connects the national gas transmission networks of the Republic of Bulgaria and the Republic of Serbia. The gas pipeline's total length is approximately 170 km from the town of Novi Iskar, Republic of Bulgaria to the city of Niš, Republic of Serbia, 62 km of which on Bulgarian territory. The throughput capacity provide is 1.8 bcm/y and gives an opportunity for the diversification of the natural gas supply to the region by ensuring new natural gas supply sources and routes. Thanks to the interconnection Bulgaria shall get access to gas sources from Western Europe along a completely new route, and Serbia to LNG terminals and other alternative sources in the region.

The regional gas infrastructure development is closely related with the plans to expand the storage capacity of the underground gas storage that is currently the only one in Bulgaria - Chiren UGS to enable it to provide services to the national and regional market, boosting the liquidity of the gas markets in Bulgaria and the region. The implementation of all these projects is interconnected and aims to contribute to the efficiency and development of the single pan-European gas network and will have a favourable impact on the security of gas supplies in the Trans-Balkan Risk Group.

7.1. Project for the expansion of the Interconnection Greece-Bulgaria (IGB)

The Interconnection Greece - Bulgaria (IGB) has been commissioned on the 1 October 2022 r. The IGB links the gas transmission network of Bulgartransgaz EAD near the city of Stara Zagora and with DESFA S.A. gas transmission network and TAP gas pipeline in the area of Komotini, Greece. The operator of the interconnection is the joint investment company ICGB AD registered in the Republic of Bulgaria the shareholders in which with equal shares are Bulgarian Energy Holding EAD and the Greek company IGI Poseidon S.A. (joint investment company with equal share of the Greek public gas corporation DEPA S.A. And the Italian group Edison International Holding N.V.).

The length of the gas pipeline Komotini-Dimitrovgrad-Stara Zagora is 182 km of which 151 km on the territory of Bulgaria and 31 km on the territory of Greece with pipe diameter of 32" (813 mm). The project for the expansion of the Interconnection Greece - Bulgaria provides for the expansion of the technical capacity of the interconnection from 3 bcm to 5 bcm annually through modernization and construction of additional infrastructure in the two gas metering stations (GMSs) at the end points of the gas pipeline - in GMS 1 Komotini (Greece) and GMS 2 Stara Zagora (Bulgaria).

IGB has two interconnection points (IPs) in Greece - with TAP (the Trans-Adriatic Pipeline) and with DESFA (the Greek gas transmission system operator); currently, only the TAP IP is

functional. The IP with DESFA will start functioning with the entry into commercial operation of the liquefied natural gas (LNG) terminal near Alexandroupolis, which is expected by the end of March 2024. Bulgaria participates in the project company – Gastrade S.A. - building the terminal as a shareholder through Bulgartransgaz EAD.

The Greek operator DESFA is currently building a compressor station adjacent to GMS 1 Komotini, which will be completed in 2025 and will allow the transport of additional quantities from the liquefied natural gas (LNG) terminal near Alexandroupolis.

The modernization of GMS 2 Stara Zagora and GMS 1 Komotini will create an opportunity to transport 5 bcm/year along the route: LNG terminal near Alexandroupolis - DESFA - IGB – the national gas transmission network of Bulgartransgaz EAD and to the markets of East and Central Europe as well as to Moldova and Ukraine.

The IGB expansion project will create a comprehensive and sustainable gas infrastructure in the region and provide a greater diversification of gas supply sources from more distant destinations, including the USA, Egypt, Azerbaijan, Turkey, etc.

7.2. Projects for the expansion of storage capacity

Natural gas storage plays an extremely important role in securing additional flexibility of the gas transmission systems, material contribution to the management of congestion and seasonal optimization in the use of the gas transmission systems. The importance of gas storage facilities will grow in the conditions of an integrated and interconnected regional market.

Chiren UGS is the only gas storage facility on the territory of the country. The project for its expansion (PCI 6.20.2) consists in the storage capacity staged increase – larger stored gas volumes, increased gas reservoir pressures accordingly and higher withdrawal and injection rates. It is a PCI project included in the current fourth list of Projects of Common Interest. The project provides for the increase of the working gas volume up to 1 bcm and increase of the withdrawal and injection rates of up to 8-10 mcm/day.

Chiren UGS is a key instrument for the functioning of the gas market in the Republic of Bulgaria, covering seasonal fluctuations in natural gas consumption in the country by securing the necessary flexibility caused by the differences between the supplies and consumption and ensures the emergency reserve. The implementation of a project for its expansion aims from one side to create conditions for safeguarding the security of supply to the Bulgarian consumers and the consumers in the region and on the other - Chiren UGS to develop as a commercial storage in an interconnected regional and European market as Chiren UGS is an integral part of the regional gas system, consisting of interconnections, LNG terminals, storage facilities. The advantage of Chiren UGS is that it is a storage facility in operation and the terms for its expansion are considerably shorter compared to the ones required for the construction of a new storage facility.

7.3. Local production in the Black Sea

Local production in the Black Sea is one of the most realistic forms of diversification of the sources of energy resources. Several concessions for natural gas production are issued in the country, whereas the production under them is of limited resource and covers an insignificant part of the domestic annual consumption. At the moment, a reliable source of local production is Kavarna - East field in Galata block, but it will also be depleted.

In that context the Ministry of Energy of the Republic of Bulgaria granted authorisation for prospecting and exploration of oil and gas expecting to increase the local production share and decrease the country dependence on natural gas imports. The granted permits include both onshore areas, and territories in the Black Sea shelf and deep waters.

8. Public service obligations related to the security of supply

8.1 Obligations, imposed on natural gas undertakings and the national authorities linked with the security of supply, including the safe operation of the gas system. Information on all obligations involving the public services, linked with security of gas supply.

In line with the Energy Act (EA), energy undertakings are liable to carry out their activity in the interest of the public and the customers in line with the requirements of this Act and any other legal documents, guaranteeing the security of supply, including the protection of sites, which represent critical infrastructure in the energy sector, the continuity and high quality of electricity, heat energy and natural gas, the efficient use of fuels and energy, the protection of the environment, the life, health and property of citizens (article 69 EA).

The Act provides (article 70, para 1 EA) that the Minister of Energy imposes to energy undertakings additional obligations to serve the public linked with:

- Continuity of supply of electricity, heat energy and natural gas;
- Protection of the environment – agreed upon with the Minister of Environment and Waters;
- Protection of sites, which represent critical infrastructure in the energy sector.
- Any additional obligations shall be imposed by virtue of an order.

Obligations to the public are envisaged to be clearly determined, transparent, non-discriminatory, and verifiable and guarantee equal conditions for access of the EU gas undertakings to national users.

Any additional costs incurred by energy undertaking shall be acknowledged to be costs under article 35 of the EA. Energy undertakings have the right to apply to EWRC to compensate for their costs, arising out from the obligations to the public that were imposed on them, including obligations involving the security of supply, the protection of the environment and the energy efficiency.

The Energy Act (Article 71) provides that energy undertakings transporting electricity, heat and natural gas or distributing electricity, heat and natural gas, offering services of public interest and have a dominant position on the market in the meaning of the Competition Protection Act to obey its provisions, inasmuch as they do not prevent in factual or legal way the performance of the obligations that were imposed on them.

Carrying out its activity in the interest of the public and the users the energy undertakings guarantee the security of supply, the continuity and quality of the electricity, heat and natural gas, the efficient use of fuels and energy, the protection of environment, the life, health and property of citizens.

The requirement for transparency of the general conditions of the contracts for the supply and transmission of natural gas are regulated in the EA and the Regulation for licensing of activities in the energy sector.

According to the EA, every customer connected to a gas transmission and/or gas distribution network has the right to choose a natural gas supplier, regardless of the country in which the supplier is registered, and the supplier is obliged to comply with the Natural Gas Trading Rules and the supply security requirements.

9. Stakeholder consultations

The Minister of Energy shall consult with the natural gas undertakings, relevant organizations representing the interests of the residential and industrial customers supplied with gas,

including electricity producers, transmission system operators and the national regulatory authority.

Based on Article 72(a) of the EA (new - OJ 54 of 2012, effective as of 17.07.2012) (1) the Minister for Energy, after consulting natural gas undertakings, the organisations representing the interests of household and non-household customers and the Commission, establishes at national level:

1. a preventive action plan detailing the measures required to remove or mitigate the effects of the risks identified, in accordance with the risk assessment made;
2. an emergency action plan detailing the measures to be taken to eliminate or mitigate the effects of disrupted gas supplies.

When adopting the plans referred to in paragraph 1 the Minister of Energy shall cooperate with the competent authorities in the region and the European Commission to ensure that they are compatible with the plans of other EU Member States in the region and to develop regional action plans.

10. Regional dimension

A key objective of Regulation (EU) 2017/1938 is by means of a plan to enhance the regional cooperation as well between the risk group countries so that decisions on the security of gas supply are not taken solely on the basis of national assessments and considerations but take into account the regional dimension. The inclusion of the regional dimension in the assessments and measures to prevent and mitigate crises increases their accuracy and ensures greater efficiency in the scale of the joint actions. Furthermore, it lowers the security costs of supplying natural gas to customers, including industrial customers, who are concerned about the impact of such costs on their ability to compete on the international markets.

To achieve this, the regulation gives a clearer regional dimension to many of the elements making up the security of supply framework, including by requiring the preparation of common risk assessments and regional chapters with jointly agreed measures to be attached to the National Preventive Action Plan and the Emergency Plan (the plans). The plans envisage a gradual approach, starting with the countries agreeing on a cooperation mechanism and followed by an exchange of proposals on cooperation within the risk groups, together with each country drafting its national plans.

The preventive action plan envisages further strengthening of interconnectivity between the neighbouring Member States in the risk group. Representatives of the gas companies - Bulgartransgaz EAD (Bulgaria), ICGB AD (Bulgaria), DESFA S.A. (Greece), FGSZ LTD (Hungary) and SNTGN TRANSGAZ S.A. (Romania) had signed a Memorandum of Understanding on the implementation of the Vertical Gas Corridor.

The development of natural gas market in the region over the last years is related to the expectations for consumption growth in the country and in the neighbouring countries of Bulgaria. The existing and planned gas infrastructure provides an opportunity for diversification of natural gas supplies both to Bulgaria and to the other countries in the region of Southeast Europe. By implementation of large-scale projects in the region for development of gas transmission infrastructure, increase of gas storage capacities and new LNG terminals, as well as the potential of local production, natural gas consumption is expected to increase in the conditions of high levels of competition and liquid markets. In 2022 and 2023 Russia's pipeline gas imports to the EU are down compared to 2021, with reduced volumes offset by increased imports of LNG and pipeline gas from alternative sources. Significant supply has been realized from various sources, such as Azerbaijan, USA and others, including LNG supply from the terminal in Revithoussa, Greece. The construction of the Alexandroupolis LNG

terminal and other planned terminals in the region will further contribute to increasing the security of supply, diversification and competition for the benefit of end-users by providing a choice of pricing conditions.

Development of the interconnectivity between Bulgarian and the countries from the region has a significant importance to achieving a market integration. There are objective expectations for growth in the natural gas consumption.

The Republic of Bulgaria is involved and takes part in the realization of strategic initiatives of the European Union (the EU) for the construction of the required infrastructure and diversification of energy supply to the EU, namely – the Southern gas corridor, access to liquefied natural gas, gas interconnections along the axis North – South, the new Vertical gas corridor, etc. Considering the activities involving the diversification of the sources and the routes of gas supply these initiatives are of particular importance both to Bulgaria and the entire region of South East Europe. In this context Bulgaria plans to establish in the short- and mid-term competition between different sources and producers of natural gas to the country, the so called "gas to gas competition". This will encourage the negotiation of competitive prices for the Bulgarian economy.

Upon the implementation of Bulgartransgaz EAD's plans, the Bulgarian gas infrastructure will connect the common European natural gas market with the markets in the Caspian region, Central Asia, the Middle East, the Eastern Mediterranean basin. 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. The planned measures to improve the stability of gas supplies for Bulgaria will also affect the general security of supplies in the entire risk group and in general for those in SEE.

11. Calculation of the N – 1 formula at the level of the risk group.

11.1.1. Regional Risk Group Trans-Balkan (according to the common risk assessment)

In accordance with Annex II to Regulation (EU) 2017/1938 the N – 1 formula describes the ability of the technical capacity of the gas infrastructure to satisfy total gas demand in the calculated area in the event of disruption of the largest gas infrastructure during a day of exceptionally high gas demand (Dmax), occurring with a statistical probability of once in 20 years.

Table 2 Dmax of the Member States

Member States	D_{max} (GWh/d)
Bulgaria	177.13
Greece	311.65
Romania	770.40
Hungary	748.14
Risk group Trans-Balkan	1903.06

The largest gas infrastructure of common interest for the Trans-Balkan gas supply risk group is the interconnection Strandzha 2 - Malkoclar. For the purpose of calculating the N – 1 standard, the entire region comprising the four countries is considered as a total 'calculated area' and only the entry points connecting the region to countries outside it have been taken

into account. The cross-border capacity points in the region have not been included. When viewing Romania, Bulgaria, Hungary and Greece as a single region with several entry points (EP). Mediesu (EP1), Ungheni (IP1) and Isaccea (EP2) are entry points to Romania. In Bulgaria gas enters at Strandzha 2 - Malkoclar to Greece at Sidiroksato, North Macedonia and Serbia, at Zhidilovo (EXP1) and Kirevo (EXP2). Additional quantities enter Bulgaria along the new IGB gas pipeline (EP10). Kipoi (EP8), Nea Mesimvria (EP9) are the entry points to Greece. To Hungary gas enters in the region at Bereg (EP3) from Ukraine, Balassagyarmat (EP5) from Slovakia, Mosonmagyarovar (EP4) from Austria, Dravaszerdahely (EP6) from Croatia and Kiskundorozsma (EP7) from Serbia.

Table 2 Maximal technical capacity of the entry and exit point in the region as of 2022, GWh/d

Romania		**Bulgaria**		**Greece**		**Hungary**	
Isaccea (Ukraine)	201.9	Strandzha 2/Malkoclar (Türkiye)	572	Kipoi (Türkiye)	48.6	Bereg (Ukraine)	517.5
Ungheni (Moldova)	21.5	ICGB – Komotini (TAP)	96.66	Nea Mesimvria (TAP)	53.37	Balassagyarmat (Slovakia)	129
Mediesu-Aurit (Ukraine)	0 (non-active)					Mosonmagyarovar (Austria)	153.1
		Kereevo (exit Serbia)	401.16*			Dravaszerdahely (Croatia)	51.7
		Zhidilovo (exit North Macedonia)	27.16*			Kiskundorozsma (Serbia)	245.8
TOTAL 1662.81							

***** ICGB was commissioned in 2022

******Firm capacity at exit points is taken out from the total capacity at the entry points. These points are used mainly as exit points.

Tables 3 and 4 set out all above parameters used for the purpose of the N – 1 index calculation in the assessment of risk for the Trans-Balkan group with and without demand-side measures set out in **Table 5** (Article 6(1) and Annex VIII to the Regulation). Furthermore, as envisaged in the Regulation, the N – 1 index is calculated at 30% and 100% of the volume of the gas stored in underground storage facility. N-1 is calculated for the period 2022 and accounts for the operation of the completed infrastructure in the region (for instance the ICGB gas pipeline). The conversion factor from 10.7 KWh/m3 applies when converting from GWh/d into M(S)m3/d.

Table 3 Calculation of the N – 1 formula for the Trans-Balkan risk group without Deff (Deff means the part of Dmax that can be sufficiently covered in a timely manner using market-based demand-side measures in the event of a gas supply disruption)

	2022	
	M(S)m³/d	**GWh/d**
EP_m (tot)	155.40	1662.81
Bulgaria	22.46	240.34
Greece	9.53	101.97
Hungary	102.53	1097.10
Romania	20.88	223.40
P_m (tot)	31.16	333.39
Bulgaria	0.60	6.42
Greece	0.00	0.00
Hungary	6.47	69.23
Romania	24.09	257.74
S_m (tot) (100% filled)	112.39	1202.54
Bulgaria	3.77	40.30
Greece	0.00	0.00
Hungary	78.48	839.71
Romania	30.14	322.53
S_m (tot) (30% filled)	90.23	965.41
Bulgaria	3.20	34.28
Greece	0.00	0.00
Hungary	65.92	705.36
Romania	21.10	225.77
LNG_m (tot)	20.99	224.59
Bulgaria	0.00	0.00
Greece	20.99	224.59
Hungary	0.00	0.00
Romania	0.00	0.00
I_m	53.46	572.00
D_{max} (tot)	177.86	1903.06
D_{eff}	0.00	0.00
N-1 (%) (100% filled)	**149.83%**	
N-1 (%) (30% filled)	**137.37%**	

Table 4: Calculation of the N – 1 formula for the Trans-Balkan risk group, with Deff included

	2022	
	M(S)m³/d	**GWh/d**
EP_m (tot)	155.40	1662.81
Bulgaria	22.46	240.34
Greece	9.53	101.97
Hungary	102.53	1097.10
Romania	20.88	223.40
P_m (tot)	31.16	333.39
Bulgaria	0.60	6.42
Greece	0.00	0.00
Hungary	6.47	69.23
Romania	24.09	257.74
S_m (tot) (100% filled)	112.39	1202.54
Bulgaria	3.77	40.30
Greece	0.00	0.00
Hungary	78.48	839.71
Romania	30.14	322.53
S_m (tot) (30% filled)	90.23	965.41
Bulgaria	3.20	34.28
Greece	0.00	0.00
Hungary	65.92	705.36
Romania	21.10	225.77
LNG_m (tot)	20.99	224.59
Bulgaria	0.00	0.00
Greece	20.99	224.59
Hungary	0.00	0.00
Romania	0.00	0.00
I_m	53.46	572.00
D_{max} (tot)	177.86	1903.06
D_{eff}	5.72	61.20
N-1 (%) (100% filled)	**154.81%**	
N-1 (%) (30% filled)	**141.93%**	

The N – 1 calculations for 2022 set out in Table 4 show that in the event of disruption of the single largest gas infrastructure (IP Strandzha 2-Malkoclar), the technical capacity of the remaining infrastructure will be capable of satisfying total gas demand in the region during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years. Taking demand-side measures into account, the N – 1 index set out in **Table 4** improves by 4,5% up to 5% (in absolute numbers). The approach set out in **Tables 3 and 4** rests on the assumption that EPm includes the total quantity of gas supplied to the region, taking into account that the share destined only for transit. There are currently two exit points (EXP) in the region for the purpose of gas transmission to neighbouring countries — the exit point to North Macedonia at Zhidilovo (EXP1) and the exit point to Serbia at Kireevo (EXP2).

Table 5: The N-1 formula for the Trans-Balkan risk group – all cases

Studied conditions		**2022**
D_{eff} not included	**N-1 (%) (100% filled)**	149.83%
	N-1 (%) (30% filled)	137.37%
D_{eff} included	**N-1 (%) (100% filled)**	154.81%
	N-1 (%) (30% filled)	141.93%

11.1.2. Regional Risk Group Ukraine (according to the common risk assessment)

Concerning the regional risk group Ukraine in order to analyse the risk of gas supply disruption along the Ukranian route, the N-1 formula accepts the single largest gas infrastructure: Velké Kapušany-Uzhgorod, the entry point located on the border between Slovakia and Ukraine.

The tables below are calculated taking account of the following hypothesis:

1. Gas supply disruption at entry point Velké Kapušany-Uzhgorod as the single largest gas infrastructure (Im);
2. Complete disruption of gas supplies from Russia;
3. Sensitivity of LNG regasification installations.

As provided for in the Regulation, the formula N-1 is calculated taking into account 100% of the volume of the working gas in the gas storage facility.

					With forthcoming LNG			
	2022	**2022-09**	**No RU* 2022**	**No RU* 2022-09**	**2022**	**2022-09**	**No RU* 2022**	**No RU* 2022-09**
N-1	**189.7%**	**189.7%**	**166.7%**	**166.4%**	**194.6%**	**194.7%**	**171.7%**	**171.4%**
D_{max}	14554.31	14554.31	14554.31	14554.31	14554.31	14554.31	14554.31	14554.31
EP_m	13692.60	13702.00	10352.70	10310.90	13692.60	13702.00	10352.70	10310.90
P_m	729.09	729.09	729.09	729.09	729.09	729.09	729.09	729.09
S_m	14022.61	14022.61	14022.61	14022.61	14022.61	14022.61	14022.61	14022.61
LNG_m	1072.29	1072.29	1072.29	1072.29	1794.66	1794.66	1794.66	1794.66

I_m	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60
D_{eff}	0	0	0	0	0	0	0	0

11.1.3. Regional risk Group Southern Gas Corridor - Caspian Sea (according to the common risk assessment)

Concerning the regional risk group Southern Gas Corridor - Caspian Sea, the single largest gas infrastructure of common interest is the interconnection point Velké Kapušany-Uzhgorod. The results of the calculation of the N – 1 formula are given in the table below:

					With forthcoming LNG			
	2022	**2022-09**	**No RU* 2022**	**No RU* 2022-09**	**2022**	**2022-09**	**No RU* 2022**	**No RU* 2022-09**
N-1	**189.7%**	**191.7%**	**179.5%**	**180.9%**	**194.6%**	**196.6%**	**184.4%**	**185.9%**
D_{max}	7362.32	7362.32	7362.32	7362.32	7362.32	7362.32	7362.32	7362.32
EP_m	8830.60	8978.20	8079.30	8185.60	8830.60	8978.20	8079.30	8185.60
P_m	435.09	435.09	435.09	435.09	435.09	435.09	435.09	435.09
S_m	5715.64	5715.64	5715.64	5715.64	5715.64	5715.64	5715.64	5715.64
LNG_m	897.60	897.60	897.60	897.60	1260.58	1260.58	1260.58	1260.58
I_m	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60	1913.60
D_{eff}	0	0	0	0	0	0	0	0

11.2. Developed cooperation mechanisms at group level

11.2.1. Procedure for exchange of information between competent authorities within the risk group.

In accordance with Article 13 of Regulation (EU) 2017/1938 when the competent authority declares one of the crisis levels, it must immediately inform the Commission as well as the competent authorities of the Member States with which the Member State of that competent authority is directly connected.

When the competent authority declares an emergency it follows the pre-defined actions as set out in its emergency plan and must immediately inform the Commission and the competent authorities in the risk group as well as the competent authorities of the Member States with which the Member State of that competent authority is directly connected in particular of the actions it intends to take.

If the competent authority of the risk groups identifies a potential disruption affecting gas supplies from Ukraine, it must notify the other competent authorities as soon as practicable before declaring the level of emergency.

List of the events triggering risks of reduction or disruption of natural gas supply:

- reduced gas flows from imports at interconnection points;
- reduced gas flow to one or more members of the group;
- incidents or detection of technical problems, which may lead to constraints in natural gas flow, affecting the main transmission pipelines connecting Member States belonging to the risk groups;
- estimate of the expected (one or two days in advance) exceedingly high demand due to extreme weather in a Member State from the risk group.

The list of competent authorities will be updated on an annual basis by the competent authority acting as facilitator for the risk group and where a change occurs in the contact details of a competent authority by the competent authority concerned.

The solidarity mechanism is still under evaluation by the competent authorities of the Member States. Once agreements have been concluded, the participating Member States will notify the group of the mechanism's existence and a notice will be published in accordance with established procedure.

Where the application of the solidarity measure is requested, the Member States must ensure that the relevant volume of gas is effectively delivered to solidarity protected customers in their respective territories. The solidarity measure referred to in Article 13 envisages that a Member State which is directly connected to the requesting Member State or (where the Member State so provides) its competent authority or transmission system operator or distribution system operator must, as far as possible, take the necessary measure without creating unsafe situations. The aim is to ensure that the gas supply to customers other than solidarity protected customers in the territory of the Member State providing solidarity is reduced or does not continue to the extent necessary and for as long as the gas supply to solidarity protected customers in the Member State requesting solidarity is not satisfied. In exceptional circumstances and upon a duly reasoned request by the relevant electricity or gas transmission system operator to its competent authority, the gas supply may also continue to certain critical power plants as defined pursuant to Article 11(7) in the Member State providing solidarity if the lack of gas supply to such plants would result in severe damage in the functioning of the electricity system or would hamper the production and/or transportation of gas.

Solidarity in accordance with Regulation (EU) 2017/1938 shall be provided to the States in the group on the basis of compensation. The Member State requesting solidarity shall promptly pay, or ensure prompt payment of, fair compensation to the Member State providing solidarity. Such fair compensation shall cover at least all reasonable costs that the Member State providing solidarity incurs from an obligation to pay compensation by virtue of fundamental rights guaranteed by Union law and by virtue of the applicable international obligations and further reasonable costs incurred from payment of compensation pursuant to national compensation rules.

11.2.2. Regional coordination system for gas (ReCo System for Gas)

In accordance with Article 3(6) of Regulation (EU) 2017/1938 the Regional Coordination System for Gas (ReCo System for Gas) established by ENTSOG and composed of standing expert groups plays a significant role in cooperation and the exchange of information between transmission system operators in the case of emergency at regional or EU level.

There are three teams of the ReCo: Team - Northwest, Team- South and Team - East. Most members of the Trans-Balkan risk group belong to the Eastern team. The role of the facilitator is to act as the first operator that notifies the others in an emergency and activates the communication system.

Transmission system operators (TSOs) shall cooperate and exchange information, including on gas supply flows in a crisis, using the Regional Coordination System for Gas (ReCo System for Gas) established by the ENTSOG. ReCo teams are primarily intended to enable the exchange of information between gas transmission system operators along the existing channels. This has the potential to facilitate the approval of common emergency procedures, the organisation of urgent communication system resilience tests and the commissioning of studies for their improvement.

Although all operational procedures of ReCo teams may be regarded as emergency measures, the existence of ReCo teams is considered a preventive measure.

After an emergency, the competent authority of the Member State that declared an emergency shall, as soon as possible but not later than six weeks after the lifting of the emergency, provides the Commission with a detailed assessment of the emergency and the effectiveness of the measures implemented, including an assessment of the economic impact of the emergency, the impact on the electricity sector and the assistance provided to or received from the Union and its Member States. Such assessment shall be made available to the GCG and shall be reflected in the updates of the preventive action plans and the emergency plans.

11.3. Preventive measures

The preventive measures to ensure the security of gas supply contained in the preventive action plan are clearly defined, transparent, proportionate, non-discriminatory and verifiable, do not unduly distort competition or the effective functioning of the internal market in gas and do not endanger the security of gas supply of other Member States or of the Union. They are designed to address the risks identified in the risk assessment, such as those relating to the need to enhance interconnections between neighbouring Member States, further improve energy efficiency, reduce gas demand and the possibility to diversify gas routes and sources of gas supply.

The Bulgarian gas transmission operator Bulgartransgaz EAD had provided 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 secured long-term and flexible gas supply contracts and the development of the gas market in Europe and in the country.