2014 - 2023 TEN-YEAR NETWORK DEVELOPMENT PLAN OF BULGARTRANSGAZ EAD

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of meeting of Bulgartransgaz EAD Management Board

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DEFINITIONS AND ABBREVIATIONS

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

AGRS – Automatic Gas Regulation Station

LNG – Liquefied Natural Gas

GMS – Gas Metering Station

GPB – Gas Pipeline Branch

GRS – Gas Regulation Station

the Company – Bulgartransgaz EAD is a combined gas transmission operator in the Republic of Bulgaria

VS – Valve Station

EEC – End Energy Consumption

CS – Compressor Station

PF – Pigging Facility

MGP – Main Gas Pipeline

TGP – Transit Gas Pipeline

MPa – Megapascal (unit of pressure)

m^3 or cubic meter – unit of volume which in this document for the purposes of determining a natural gas quantity, represents the natural gas quantity in a volume of one cubic meter at 293.15 K (200C) and absolute pressure of 0.101325 MPa.

EIA – Environmental Impact Assessment

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

PEC– Primary Energy Consumption

CP – Construction Permit

CIW – Construction and Installation Works

UGS– Underground Gas Storage

National Gas Transmission Network (NGTN) – gas transmission network the main purpose of which is natural gas transmission to customers in Bulgaria connected thereto and also to interconnection points. The NGTP is owned by Bulgartransgaz EAD and used for performing transmission services;

Gas Transmission Network for Transit Transmission (GTNTT) – gas transmission network the main purpose of which is natural gas transmission from the Bulgarian-Romanian border to the borders with Turkey, Greece and Macedonia, used also for natural gas transmission to customers in Bulgaria connected to the network or to interconnection points on the territory of Bulgaria. The GTNTT is owned by Bulgartransgaz EAD and used for performing transmission services;

Bulgartransgaz EAD gas infrastructure – includes the NGTN, the GTNTT and UGS Chiren

TAP – Trans-Adriatic Pipeline – natural gas pipeline project, starting at Greece, crossing Albania and the Adriatic Sea and coming ashore in Southern Italy

TANAP– Trans-Anatolian Natural Gas Pipeline - natural gas pipeline project, starting at the Georgian-Turkish border, crossing Turkey to Europe

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SOURCES USED

- 2020 Energy Strategy of the Republic of Bulgaria as of June 2011,
- National Statistical Institute - GDP, PEC, EEC and other data, (www.nsi.bg)
- Data on natural gas consumption, Eurostat, (http://epp.eurostat.ec.europa.eu)
- 2001-2012 National energy balance of the Republic of Bulgaria,
- A list of Projects of Common Interest, webpage of the European Commission, Directorate Energy, (www.ec.europa.eu)
- A Report of the World Bank, Economic Consulting Associates Ltd (ECA) and Infraproject Consult Ltd Bulgaria: Options to Improve Security of Gas Supply
- Public information related to the development of the gas market in the region, published on the web pages of the following companies:
  - Transgaz SA (www.transgaz.ro)
  - DESFA S.A. (www.desfa.gr)
  - Botas (www.botas.gov.tr)
  - JP Srbijagas (www.srbijagas.com)
  - GA-MA AD (www.gama.com.mk)
  - DEPA, S.A. (www.depa.gr)
  - ITGI (www.edison.it)
  - TAP (www.trans-adriatic-pipeline.com)
  - Shah Deniz (www.bp.com)
- Domestic gas consumption forecast by the public supplier Bulgargaz EAD, (www.bulgargaz.com)
- Information related to natural gas production in Bulgaria, webpage Petroceltic International Plc (the former Melrose Resources), (www.petroceltic.com)
- Bulgartransgaz EAD 2014 - 2018 Business Programme, approved by Minutes No.32/07.01.2014 of a meeting of Bulgartransgaz EAD Management Board and Minutes No.21/22.01.2014 of Bulgartransgaz EAD Supervisory Board.
- 2014-2016 Annual investment and maintenance program, approved by Minutes No.32/07.01.2014 of a meeting of Bulgartransgaz EAD Management Board and Minutes No.21/22.01.2014 of Bulgartransgaz EAD Supervisory Board.
- Information from other internal company documents and correspondence with the stakeholders.
- Regional Investment Plan 2012-2021 Central and Eastern Europe
- Regional Investment Plan 2012-2021 South Corridor
- ENTSOG 2013-2022 Ten-Year Network Development Plan
- Legal framework quoted: Directive 2009/73/EC concerning common rules for the internal market in natural gas and Regulation (EC); Regulation (EC) No.994/2010 of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC of the Council; Energy Act (amended OJ, issue 66 of 26 July 2013);

INTRODUCTION

Bulgartransgaz EAD 2014-2023 Ten-year plan for development of the natural gas transmission and storage infrastructure sets out the vision for the corporate development of the Company as an independent gas transmission operator. It is consistent with the major European and regional priorities - ensuring the security of supply in Bulgaria and the region, achieving diversification of natural gas supply sources and routes, and strengthening of an integrated single gas market.

The main objective of the Plan is to achieve maximum transparency of future characteristics of the corporate gas transmission networks and storage facilities. Thus all market participants will be informed of and enabled to undertake long-term investment decisions.

The TYNDP describes Bulgartransgaz EAD activities in the next ten years aimed at keeping and developing the reliability and efficiency of the existing gas transmission networks and storage facilities, as well as creating suitable conditions for the strengthening of an integrated and stable gas market.

This Plan identifies and analyses the reasons and factors determining the need of the planned projects and new investments, as well as their allocation over time. Within the forthcoming ten-year period, Bulgartransgaz EAD investment policy shall be focused on projects aimed at:

- Connection with South Stream - a key gas pipeline project that will ensure diversification of the gas transmission routes for supply of Russian natural gas to Europe;
- Construction of new interconnections with the neighbouring countries - Romania, Greece, Turkey and Serbia;
- Support and coordination with the Southern Gas Corridor projects (TAP - Trans-Adriatic Pipeline, TANAP – Trans Anatolian Natural Gas Pipeline, as well as other pan-European projects) which envisage to ensure diversification of natural gas supply sources and routes and gas transmission routes to Europe;
- Development of the existing gas transmission networks and the natural gas storage system by construction of new gas transmission pipelines and their auxiliary facilities and expansion of the existing gas storage facility;
- European integration of the gas transmission networks by implementing reverse technical interconnection with the gas networks of the neighbouring countries and creating opportunities for diversification of gas supply sources and routes;
- Increasing the national transmission capacity and to the neighbouring countries;
- Reconstruction, modernization, rehabilitation and replacement of ageing existing facilities in order to increase and ensure the technical security and safety of natural gas transportation and environmental protection;
- Current maintenance of existing facilities to ensure their efficient and trouble-free operation;
- Connection of production companies' gas pipelines;
- Access of new municipalities and new end users to natural gas;

The implementation of the investment strategy presented in this Plan will provide the opportunity to increase the use of natural gas in the country with the respective economic, social and environmental benefits, and diversify the sources and routes of gas supply for the country. It will also promote the establishment of a liberalized natural gas market resulting in a wider choice including price-wise for all market participants, increased security of supply and overall gas supply, thus reducing the energy dependence of the country.

The TYNDP complies with the guidelines and objectives, laid down in the Republic of Bulgaria Energy 2020 Strategy and is a step forward to establishing a free natural gas market both at national and common liberalized European gas market level.

Having regard to achieving the balance between the interests of TSOs and the other market participants, the TYNDP is subject to public consultation initialled by Bulgartransgaz EAD based on which the interrelations between the Company's projects and the development plans of the stakeholders can be considered in the Plan.

Pursuant to Art. 21, para 3, item 8 of the Energy Act, the State Energy and Water Regulatory Commission (SEWRC) shall approve the TYNDP and monitor its implementation.

TYNDPs shall be prepared by the gas transmission operators on the territory of the European Union in line with Art. 22 of Directive (EC) 2009/73. The Bulgarian gas transmission operator Bulgartransgaz EAD prepares its TYNDP in line with Art. 22 of Directive (EC) 2009/73 and Art. 81, para 1 of the Energy Act (EA) published in SG No: 54 dated 17.07.2012 valid as of 17.07.2012.

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

BULGARTRANSGAZ EAD PROFILE

Bulgartransgaz EAD is a sole owner joint stock company, registered on 15.01.2007 by a Decision of Sofia City Court. The owner of 100% of its shares is Bulgarian Energy Holding EAD whose principal is the Ministry of Economy and Energy (MEE).

Bulgartransgaz EAD is currently undergoing a process of certification as an independent gas transmission operator.

In compliance with the provisions of the Energy Act and Directive 2009/73 (EC) dated March 2013 Bulgartransgaz EAD is governed by a two-tier organizational management structure: Supervisory Board consisting of a chairman and two members and Management Board also consisting of a chairman and two members.

Bulgartransgaz EAD is a combined gas operator carrying out natural gas transmission and storage activities. The company is an owner and operator of:

- National gas transmission network with major function – natural gas transmission on the territory of Bulgaria to the natural gas distribution companies and industrial consumers;
- Gas transmission network for natural gas transit transmission with major function - natural gas transmission through the territory of Bulgaria to the neighbouring countries Romania, Turkey, Greece and Macedonia;
- Underground gas storage in Chiren (Chiren UGS) with a major function of natural gas storage covering seasonal swings in natural gas consumption and ensuring the security of supply in line with the N-1 standard implementation.

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

For natural gas transmission: Licenses No. L-214-06 and No. L-214-09 of 29.11.2006

For natural gas storage: License No. L-214-10 of 29.11.2006

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

The company is responsible for the uniform management and reliable operation of the natural gas transmission system in compliance with the quality and quality reporting requirements, the networks' development in accordance with the long-term forecasts and plans for gas supply development, maintenance, operation, management and development of the underground gas storage (UGS) Chiren, non-discrimination of users with regard to natural gas transmission and storage. In addition to the operational management of the gas transmission system, engineering, investment and service activities are carried out.

The structure of the Company includes a Head office and five operational regions: Northwestern operational region Botevgrad, Northeastern operational region Valchy dol, Southeastern operational region Stara Zagora, Southwestern operational region Ihtiman and Chiren UGS. Botevgrad repair workshop is responsible for the operational management and maintenance of the network on the respective territory.

Since its establishment Bulgartransgaz EAD has played a key role and is responsible for the operation of the gas transmission system and the gas market development in the country and the region. Bulgartransgaz EAD strives constantly to improve the quality of the offered services and provide added value for the development of the gas market in Bulgaria. As a result of the sustainable business model, the company shows very good financial results which are expected to continue in future and are needed to ensure reliability and development of the natural gas transmission and storage infrastructure.

The Company pursues transparent, equal treating 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 Third Energy Package, the European and the Bulgarian legislation.

DESCRIPTION OF NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE

Bulgartransgaz EAD Gas infrastructure on the territory of the Republic of Bulgaria consists of the national gas transmission network supplying natural gas to most Bulgarian users, the gas transmission network for transit transmission ensuring mainly natural gas transport to Turkey, Greece and Macedonia and the underground gas storage in Chiren (UGS Chiren), directly connected to the national gas transmission network.

National gas transmission network (NGTN), gas transmission network the main purpose of which is natural gas transmission to consumers in Bulgaria connected thereto, comprising about 1700 km main gas pipelines and high-pressure gas pipeline branches, three compressor stations – CS Kardam-1, CS Valchi Dol and CS Polski Senovets with total installed capacity of 49 MW, gas regulation stations, gas metering stations, electrochemical protection system, cleaning facilities, communications system, information system and other ancillary facilities. Its technical transmission capacity amounts to 7,4 bcm/y and the maximum working pressure is 54 bar.

Gas transmission network for transit transmission (GTNTT), gas transmission network the main purpose of which is natural gas transit transmission, used also for gas transmission to customers in Bulgaria connected thereto, comprising 945 km gas pipelines and six compressor stations – CS Kardam-2, CS Provadia, CS Lozenets, CS Strandja, CS Ihtiman and CS Petrich, with total installed capacity of 214 MW, electrochemical protection system, cleaning facilities, communication system, information system and other ancillary facilities. It mainly transports natural gas quantities from an entry point at the Bulgarian-Romanian border to Turkey, Greece and Macedonia. Its technical capacity for natural gas transit transmission in total to the three directions amounts to 18,7 bcm/y and the maximum working pressure is 54 bar.

Bulgartransgaz EAD constructed and since 01.01.2014 has put into commercial operation a reverse flow station metering natural gas quantities between the transit and national gas transmission networks GMS Ihtiman and by using it the Operator can transport natural gas quantities to networks users of the two networks.

The **Underground Gas Storage Chiren** was built on the lands of Chiren village and is equipped with specialized underground and surface facilities required to secure injection, production and quality of the stored gas and a compressor station with total installed capacity of 10 MW. The present storage capacity can provide storage of up to 550 mcm natural gas. The withdrawal and injection capacity according to the formation pressures and other factors, is between 0.5 mcm/day (minimum) to 4,2 mcm/day (maximum) for withdrawal, and 0,5 mcm/day (minimum) to 3,16 mcm/day (maximum) for injection.

The main entry and exit points of Bulgartransgaz EAD gas transmission network are the following:

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

Interconnection entry-exit point (IP) Negru Voda 2, 3/Kardam – a connection between Bulgartransgaz EAD national gas transmission system for transit transmission and the gas transmission system operated by Transgaz S.A. (Romania) on the Bulgarian-Romanian border in the area of Negru Voda/Kardam;

Interconnection entry-exit point (IP) Kulata/Sidirokastro – a connection between Bulgartransgaz EAD gas transmission network for transit transmission and the gas transmission system operated by DESFA (Greece) on the Bulgarian-Greek border in the area of Kula/Promachonas;

Interconnection point (IP) Strandja/Malkoclar – an exit point, connection between Bulgartransgaz EAD national gas transmission system for transit transmission and the gas transmission system operated by Botas (Turkey)

Interconnection point (IP) Gueshevo/Jidilovo – an exit point, connection between Bulgartransgaz EAD national gas transmission system for transit transmission and the gas transmission system operated by GA-MA (Macedonia)

Interconnection entry-exit point (IP) Ruse/Giurgiu – a connection between Bulgartransgaz EAD national gas transmission system and the gas transmission system operated by Transgaz S.A. (Romania) on the Bulgarian-Romanian border in the region of Ruse/Giurgiu (pending commissioning in 2014);

Entry-exit point GMS Ihtiman – a reverse flow gas metering station, a connection of the gas transmission network for transit transmission and the national gas transmission network, enabling commercial metering of the quantities transferred between the two networks;

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

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

NATURAL GAS MARKET IN THE COUNTRY AND THE REGION

1. NATURAL GAS MARKET IN BULGARIA

Bulgartransgaz EAD transmission and storage activities are regulated and carried out on the basis of licenses issued by the SEWRC. The basic requirements for these activities are governed by the Energy Act and the by-laws harmonized with the European legislation in the field.

Natural gas supplied to the gas transmission system in the country for the needs of the Bulgarian market is currently secured by imports from Russia and local production and in 2013 the quantities by sources of supply are as follows:

№	Type of supply	Quantity, mcm	Relative share
1	Imported natural gas	2 538	90,2%
2	Local production	277	9,8%
	TOTAL	2 815	100%

The main customers of the natural gas transmission service to connected customers and the gas distribution networks in the country are the public supplier Bulgargaz EAD and Overgas Inc. AD. The major customer of the natural gas storage service is the public supplier.

On the basis of a long-term contract OOO Gazprom export uses a significant part of the capacity of the transit transmission network by the natural gas transmission service through the territory of Bulgaria from the entry point on the border with Romania to the exit points at the borders with Turkey, Greece and Macedonia.

Natural gas local production in the period 2000-2004 is symbolic – below 1% of consumption and results mostly from the fields of the company Oil and Gas Exploration and Production Plc.

Since 2004 the company Melrose Resources Ltd. (later acquired by Petroceltic Ireland) has started natural gas local production firstly from Galata field and then from the newly discovered fields Kaliakra and Kavarna with access to the gas transmission system secured by Bulgartransgaz EAD at entry point GMS Provadia. As a result of the gradual development of the field, local production increased significantly and reached its peak in 2011 – 443 mcm or 14% of domestic consumption. By contrast, local production in 2010 was only 74 mcm or 3% of domestic consumption for that year. Since 2012 a gradual decrease of the quantities produced locally due to field depletion has started. Nevertheless the last seismic studies in the Galata block of new territories showed 23% probability of the availability of new 3,5 bcm gas.

A number of natural gas exploration licenses have been issued in the country, whereas the best studied and with possibility for real production in the coming years is the gas condensate field Koynare of Direct Petroleum (acquired by the company TransAtlantic), block A-Lovech with a forecast quantity of 13,7 bcm.

UGS Chiren plays a major role in providing natural gas in case of a shortage from the entry points of the national gas transmission network for the country, by covering the seasonal fluctuations in consumption and providing emergency reserve. It was constructed on the place of the already depleted gas field of the same name.

Gas distribution is carried out by regional and local distribution companies - mostly private, operating in accordance with a licensing regime and price regulation for the activity distribution. Households and small and medium-sized enterprises (SMEs) are customers of the gas distribution companies.

Production companies and two major groups of consumers are connected to Bulgartransgaz EAD transmission network – trade companies licensed for natural gas distribution and supply and non-household customers connected to the transmission network.

- **Major gas market participants in the country:**
  - Bulgartransgaz EAD – a combined gas operator responsible for the performance of natural gas transmission and storage activities;
  - Bulgargaz EAD – a public supplier of natural gas in Bulgaria responsible for ensuring the supply of natural gas at prices and under conditions approved by SEWRC;
  - Gas traders/shippers - conclude transactions for natural gas supply with the public supplier, public providers, consumers, other gas traders, production companies, natural gas storage companies and the combined operator;
  - Gas distribution companies – by combining the activity public supply with the activity natural gas distribution, they supply natural gas to end users connected to their networks. It is their obligation to construct and develop the gas distribution networks according to the long-term business plans and conditions approved by SEWRC;
  - Non-household natural gas consumers;
  - Household natural gas consumers.

- **Пазарен потенциал и перспективи за развитие**

- **Market potential and development prospects**

Bulgartransgaz EAD operates in a rapidly changing natural gas market and endeavours to achieve higher level of liberalisation of the market in Bulgaria and the region. In 2013 there is an insufficient level of competiveness of gas sources for the domestic market, thus natural gas storage capacity at Chiren UGS and local production are the main alternatives concerning security of supply in case of disruption of imports at the main entry points Negru Voda 1 and Negru Voda 2,3.

According to the development objectives and Bulgartransgaz EAD investment plans within the period 2014-2023, the following trends are expected to be outlined:

- Diversification of natural gas supply sources and routes;
- New entry points to Bulgartransgaz EAD gas transmission system, including from local production;
- Better use of the transmission capacity of the existing infrastructure and increase of cross-border capacity:
  - Connectivity with the neighbouring countries - construction of Interconnections - Romania, Serbia, Greece and Turkey and enabling the transmission of permanent bi-directional capacity of the existing connections with Romania and Greece;
  - Connecting the existing infrastructure with the gas pipeline South Stream and the Southern Gas Corridor projects;
  - Expanding the natural gas storage, withdrawal and injection capacity in UGS Chiren.
  - Construction of new underground gas storage on the territory of the country;
  - Access to terminals for regasification of liquefied natural gas (LNG).
- Market stabilization and gradual increase of natural gas domestic consumption above the levels prior to the global financial crisis;
- Increase of the local production share in the total mix of natural gas supply sources in the country (mainly because of the development of gas-condensate field Koynare - Block 'A- Lovech' - section Deventsy, considering the current production and the future potential of block Galata;
- Promotion of gasification by expanding the gas transmission network to new regions;

2. NATURAL GAS MARKET IN THE REGION

The development of the natural gas market in the region is related to the expected growth of natural gas consumption in Bulgaria's neighbouring countries, based on the one hand on the expected increased consumption and on the other - the existing contracts for natural gas supply from the Russian Federation to the Balkans, and the opportunities for natural gas supplies from new sources by the Southern Gas Corridor. These expectations are in line with the plans for construction of new connections between the transmission systems of Bulgaria, Romania, Turkey, Greece and Serbia.

The review of the natural gas markets in the neighbouring countries outlines the main trends for development of the regional gas market:

2.1 Greece[1]

Currently our country has one Interconnection point with Greece – Kulata/Sidirokastro. This

[1] *The review of natural gas market in Greece was prepared on the basis of the Report of the World Bank, Eurostat, the webpage of the gas transmission operator, internal company documents and correspondence with DESFA S.A and other sources, indicated in the text)*

interconnection serves mainly as an entry point enabling Greece to receive Russian natural gas and during the January 2009 crisis reverse flow to Bulgaria was carried out through this interconnection. As of January 1, 2014 the Bulgarian gas transmission system has capacity for physical gas transmission towards Bulgaria through this point to the amount of 3 mcm/day, of which 1 mcm/day firm capacity and 2 mcm/day interruptible.

Natural gas consumption in Greece has increased more than twice over the last decade, reaching up to 4 bcm/y in 2008. In 2009 and 2010, due to the severe economic slowdown, consumption has dropped to 3.4 bcm/y and 3.7 bcm/y respectively, thus reaching levels above 4 bcm/y in 2011 and 2012. A significant share of natural gas consumption came from electricity generation, averaging around 71% of demand for the period 1999 - 2009.

Although Greece produces a small amount of natural gas, most of its consumption is covered from imported gas which in 2009 came from: LNG sources at domestic terminals (22%); from the gas interconnection with Turkey (20 %); and the gas pipeline with Bulgaria supplying gas from Russia (57 %).

The Public Gas Company (DEPA) announced several demand forecasts for Greece ranging from estimated levels of 5.9 and 8.1 bcm/y by 2015 and 6.2 and 8.8 bcm/y by 2020. In light of the most recent economic and political events in Greece, it would be better to adopt a more conservative natural gas demand forecast.

DEPA has three long-term contracts with foreign companies for gas supply – with the Russian Gazprom Export, the Algerian Sonatrach (LNG) and the Turkish Botas for natural gas supply with a total volume under these contracts of 4.2 bcm/y until 2016.

Greece uses various supply sources to satisfy its supply needs in case of increased domestic demand.

The LNG terminal in Revithoussa has not yet been used to its full capacity and has spare capacity for increased gas storage and supply quantity.

In May 2010 Greece signed a non-binding Memorandum of Understanding with Qatar for LNG import, which includes plans to import Qatari LNG and to construct a € 3.5 billion LNG terminal with a capacity of 7 bcm/y in Western Greece.

The Turkey-Greece Interconnector (ITG) has a potential to reach a capacity of 11.5 bcm/y (*www.edison.it*), as it is planned to be part of the Interconnector Turkey-Greece-Italy (ITGI). The development of this potential after the investment decision for selection of the project Trans-Adriatic Pipeline (TAP) for gas supplies in Europe by the Consortium Shah Deniz II remains unclear.

On June 28, 2013 the Consortium Shah Deniz II announced its selection of the TAP project as natural gas transmission route from the gas field of the same name to Europe and at the end of 2013 took the final investment decision on the second stage of the gas field development. According to the announcement, the supplies to Europe (Italy, Greece, Bulgaria) are expected to amount 10 bcm/y *(www.bp.com/en).* They are expected to begin by the end of 2019, following TAP construction.

Both the existing gas pipeline between Bulgaria and Greece which in compliance with the requirements of Regulation (EC) 994/2010 since January 1, 2014 provide opportunity (firm capacity) for gas transmission towards Bulgaria and the future Interconnector Greece-Bulgaria (IGB) are of key significance to the natural gas supplies from the gas field Shah Deniz II to Bulgaria, bearing in mind the opportunity under discussion for a potential interconnection between TAP and IGB near the town of Komotini, Greece.

2.2 Turkey[2]

The consumption of Turkey in 2010 was about 39 bcm and in 2020 is expected to reach between 55 and 62 bcm. Natural gas makes up over 30% of total energy consumption with the main consumer being electricity generators (56% of total consumption) and industrial and household consumption making up over 20% each. Demand is expected to continue to increase in future, as Turkey plans to develop more gas fired power plants. Household and industrial consumption is also expected to increase along with the development of more distribution pipelines and expansion of the existing distribution networks following privatization of the distribution companies.

Turkey produces small amounts of natural gas, covering only about 3% of domestic consumption between 1999 and 2009 by local production. Natural gas production in 2010 was 0.7 bcm/y. Turkey imports natural gas mainly from Russia. However, the share of Russian imported gas has been declining in recent years (54% of imports in 2010), as Turkey diversifies its gas supply by importing from Iran and Azerbaijan, and also importing LNG from Algeria and Nigeria. LNG capacity accounted for roughly 22% of gas imports in 2010.

Comparison of the future consumption levels with the contracted future supply levels shows that Turkey could face an import gap by 2015 onwards. It should be noted that the contract for LNG supplies from Algeria will expire in 2014.

The existing gas infrastructure in the country is with cross-border capacity for import amounting to 53 bcm/y (6.6 bcm/y from Azerbaijan, 10 bcm/y from Iran, 16 bcm/y from Blue Stream, 5.6 bcm/y from LNG, 14 bcm/y from Russia through Bulgaria). This would be sufficient to cover demand levels until 2018.

On December 17, 2013 the Consortium Shah Deniz II took the final investment decision on the second stage of the gas field development. The decision states that the Republic of Turkey can rely on additional 6 bcm/y delivered by the Azerbaijan company SOKAR after 2018 *(www.bp.com))*.

If the other new projects planned are implemented (e.g. a new gas pipeline from Iraq (10 bcm/y), the Southern Corridor projects and the new LNG terminal on the South coast (10 bcm/y), Turkey will play a more significant role not only as a transit country of Caspian gas but also as a supplying country and/or transporter of additional natural gas quantities to the neighbouring countries in Europe.

The northwestern part of Turkey is a major consumer of natural gas in the country. At present the transmission system of Turkey faces difficulties in securing gas supplies to the region of Istanbul. The country experienced seasonal demand of additional quantities of gas from the Balkan direction during winter due to the insufficient storage capacity. In this regard, there is further potential for expansion of the Interconnection between Bulgaria and Turkey, whereas the cost-effective amount of additional capacity according to the Bulgartransgaz EAD assessment is between 3 and 5 bcm/y.

[2] *The review of natural gas market in Turkey was prepared on the basis of the Report of the World Bank, the webpage of the gas transmission operator, internal company documents and correspondence with Botas and other sources, indicated in the text)*

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2.3 Romania[3]

Romania has a very long-established gas industry, with indigenous local production (about 75% - 85% of consumption), well developed gas transmission infrastructure, a high degree of gas distribution networks' development, as well as underground gas storage facilities.

Romania has nine (physical) cross-border gas pipelines - 5 with Ukraine, 3 with Bulgaria and 1 with Hungary, 6 of them being cross-border entry points and 3 - exit points. The country has large natural gas reserves, about 600 bcm. These quantities would be sufficient to meet demand in Romania for the next 50 years.

The balance of demand is met by imports of Russian gas under contracts with Gazprom. Within the 1990-2002 period, the import of natural gas from Russia was between 20-25% of total consumption in the country.

Over the past ten years demand declined from 18 bcm/y in 2006 to about 13 bcm/y. A moderate increase to levels of approximately 17 bcm/y is expected in 2020.

The existing supply contracts with Gazprom provide for estimated maximum annual volume of 7.5 bcm/y. Based on the estimated consumption and the local production levels, the non-contracted volume to cover the needs of Romania is expected to be about 1 bcm by 2018 and 3.5 bcm by 2020. This assessment assumes that Romania will need new supply routes.

The Program for infrastructure development in Romania comprises numerous opportunities for major new supply sources - full utilization of the capacity of the existing Interconnector with Hungary (4 bcm/y), the LNG project AGRI (Azerbaijan - Georgia - Armenia) with capacity of 7 bcm/y, as well as the project White Stream for Caspian gas supplies directly across the Black Sea from Georgia (a Report of the World Bank).

The Interconnection of Romanian with Hungary enables Central European gas transmission to South Europe and to the territory of Bulgaria. The reserves of gas in Romania are another potential opportunity to use the supply capacity towards Bulgaria.

On the other hand Romania assures that in the near future the Interconnector with Hungary will be fully bidirectional, thus enabling gas supplies through Bulgaria and Romania to the European market. These conditions determine the extreme significance of the bidirectional Interconnector Ruse-Giurgiu currently in its final stage of construction.

2.4 Macedonia[4]

The natural gas market in Macedonia is in the process of development and only the northern part of the country is gasified. Currently the only Interconnection of Macedonia is with Bulgartransgaz EAD gas transmission network for transit transmission with design capacity of 1 bcm/y delivering at present Russian natural gas for the needs of Macedonia. The Macedonian gas infrastructure is under-utilized, with only about 16% load factor of the gas pipeline.

Natural gas consumption has increased steadily since 2004 but is still at a very low level, reaching 160 mcm in 2013. Natural gas is mostly used in industries (as final consumption)

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[3] *The review of natural gas market in Romania was prepared on the basis of the Report of the World Bank, Eurostat, the webpage of the gas transmission operator, internal company documents and correspondence with Transgaz S.A.)*

[4] *The review of natural gas market in Macedonia was prepared on the basis of the Report of the World Bank, the webpage of the gas transmission operator, internal company documents and correspondence with GA-MA AD)*

and by the district heating companies (heat production). Currently there is no gas distribution network in Macedonia.

The Ministry of Economy estimated that consumption will increase significantly over the next few years in consequence of the construction and operation of several combined heat and power plant (CHP) expected to be operational post 2014 and the increased domestic household gas consumption. Although natural gas only accounts for 3% of Macedonia's Total Primary Energy Supply (TPES), it is estimated that demand for natural gas in the period 2015-2020 could reach around 1 bcm/year.

Having regard to the above mentioned, this Plan does not consider the need of additional capacity to this country, nor development of any interconnection with it.

2.5 Serbia[5]

Serbia is only partially gasified, with only one entry point of its transmission network at the Serbian-Hungarian border. Natural gas only accounts for 13% (2.5 bcm/y consumption in 2011) of primary energy consumption. Industrial consumers account for 63% of consumption, followed by households (20%) and district heating companies (17%).

A World Bank financed study (South East Europe Regional Gasification Study) forecasted gas demand for 2012 to be 2.9 bcm/y, and 3.4 bcm/y in 2020. Demand is expected to be driven by increased household consumption and industrial demand through the planned development of the distribution networks. This is underlined by the existing energy strategy of the Government of Serbia which will be revised shortly.

Serbia relies mostly on imported gas from Russia which in 2011 amounted to well over 90% of the total natural gas import. In 2012 the country signed a long-term supply contract with Gazprom with maximum annual volume of 2.5 bcm/y by 2020.

In order to ensure security of supply, Serbia relies on the implementation of South Stream, while also being interested in other alternative options for diversification of sources and routes through storage and new interconnections with the neighbouring gas markets. A significant project in this regard is the planned Interconnector Bulgaria-Serbia, which is at the stage of feasibility and pre-investment study. In a medium term perspective Bulgartransgaz EAD gas transmission system is expected to be able to provide capacity and ability to deliver these alternative quantities upon implementation of the other planned interconnections and international gas pipeline projects in the region.

2.6 Conclusion from the analysis of the gas markets in the region

In connection with the review of the neighbouring countries' gas markets, it can be summarized that there are objective expectations for growth of natural gas consumption in Bulgaria's neighbouring markets. At the same time, the forecasts for natural gas demand increase in the countries of the region is a key prerequisite for the construction of the planned new interconnections between Bulgaria and Romania, Turkey, Greece, Serbia and the connectivity with cross-border projects (South Stream, the Southern Gas Corridor projects).

In turn, the implementation of the planned infrastructure projects in synergy will lead up to stable integration of the gas market in the region. Favourable conditions for diversification will be created and thus reduction of dependence on a single supplier and route, thus

[5] *The review of natural gas market in Serbia was prepared on the basis of the Report of the World Bank, the webpage of the gas transmission operator, internal company documents and correspondence with Srbijagas)*

enhancing significantly the security of supply in the country and the region.

As a result of all these, the existing cross-border firm exit capacity of the Company gas transmission system 18.7 bcm/y of the gas transmission network for transit transmission and around 3 bcm/y of the national gas transmission network (depending on the national consumption will be used more efficiently.

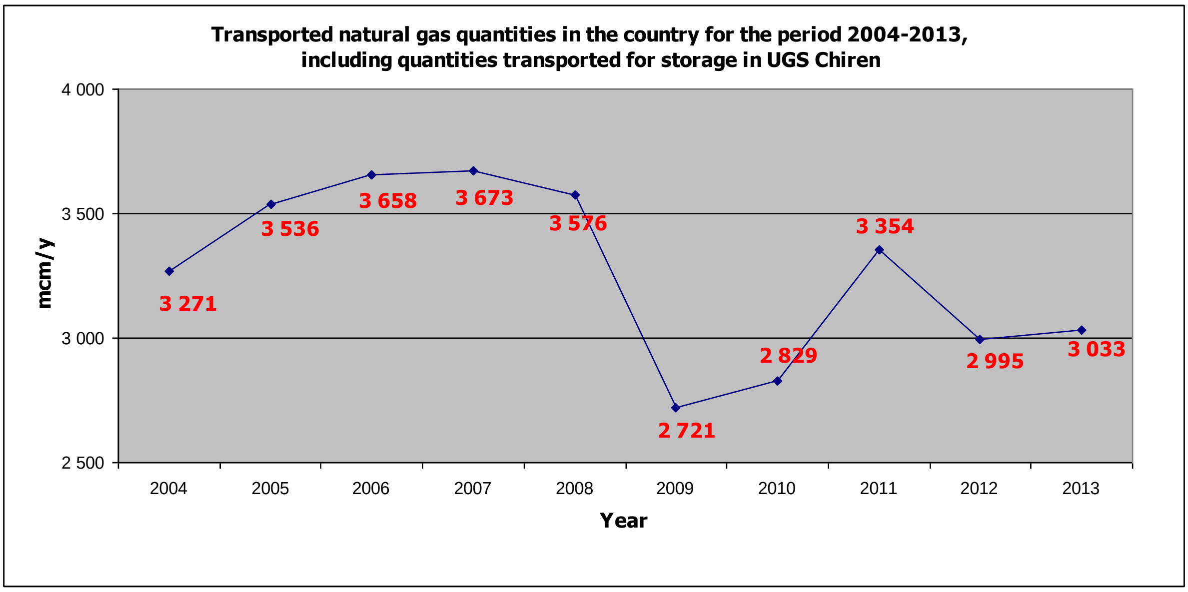
1. NATURAL GAS TRANSMISSION COVERING CONSUMPTION IN BULGARIA

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

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

The transmitted natural gas quantities along the gas transmission network of Bulgartransgaz EAD in 2013 amounted to 3.033 mcm (including the quantities transmitted for injection in Chiren UGS) amounting to 1.2% increase compared to the previous year.

Over the last ten years the transported natural gas quantities (including the quantities transported for storage in Chiren UGS) are indicated in the diagram:



Natural gas quantities indicated as delivered in the country (2 815 mcm) and respectively the actually transported quantities (3 033 mcm) differ due to the fact that the transmission activity also includes:

1. Quantities transported for storage activity;
2. Difference between the injected and withdrawn quantities in Chiren UGS;
3. Difference in the gas quantity under pressure in the gas transmission system;
4. Technological losses, differences in measurement, technological gas, etc.

The technical project capacity of the network for natural gas transmission to most of the consumers in the country amounts to 7.4 bcm/y.

License № L-214-06/29.11.2006 has been issued to Bulgartransgaz EAD for a period of 35 years enabling the natural gas transmission activity.

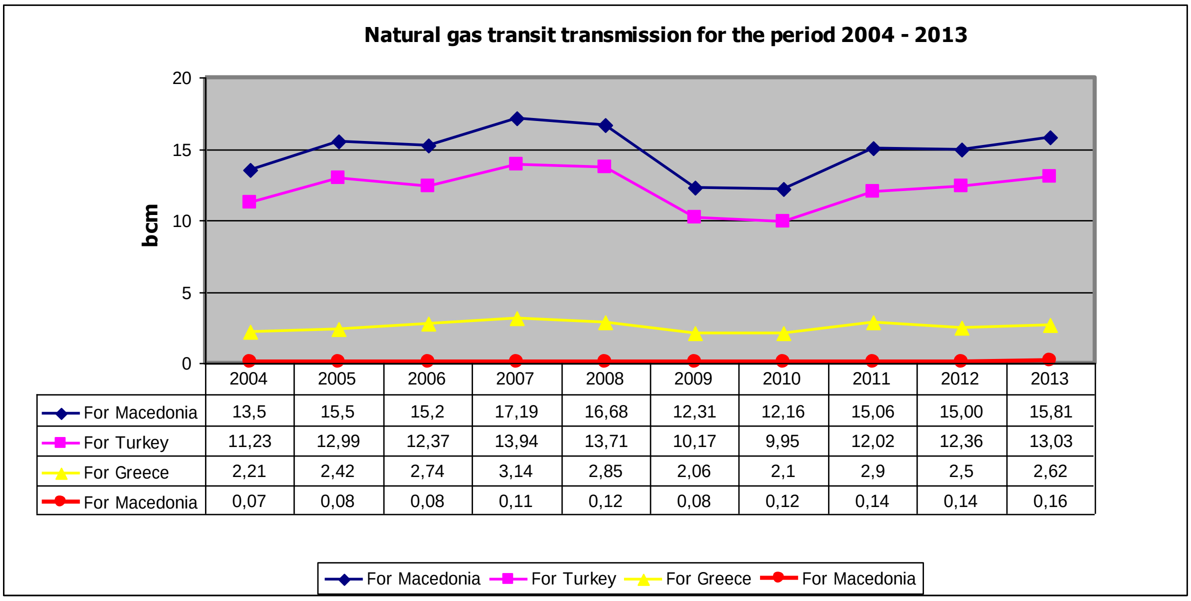
2. NATURAL GAS TRANSIT TRANSMISSION

Bulgartransgaz EAD is an owner and operator of the gas transmission network for natural gas transit transmission through the territory of Bulgaria. The transit transmission of natural gas is performed through gas pipelines with a total length of 945 km and six compressor stations with total installed capacity 214 MW providing deliveries in three main directions – Turkey, Greece and Macedonia. The transported quantities cover 100% of the consumption in Macedonia, about 70% of consumption in Greece and about 35% - 40% of consumption in Turkey.

License No L-214-09/29.11.2006 for transmission has been issued by SEWRC for a period of 35 years allowing Bulgartransgaz EAD to carry out transit transmission of natural gas.

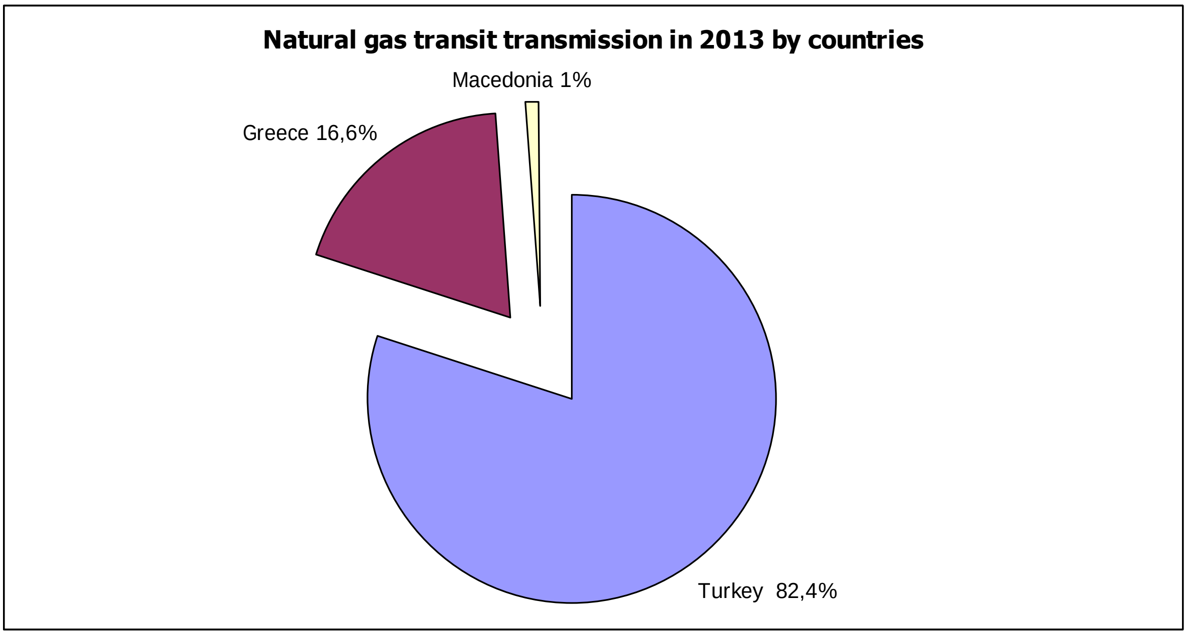
The transited natural gas quantities in 2013 amount to 15,81 bcm or 5.3% more than those in 2012 (15,00 bcm). The maximum technical capacity for natural gas transit transmission in total for the three directions amounts to 18.7 bcm/year and for the respective countries is as follows: Turkey 14 bcm/y; Greece 3,7 bcm/y; Macedonia 1 bcm/y.

Transit transmission through the territory of Bulgaria for the period 2004-2013, including by countries, is shown in the diagram below:



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
For Macedonia	13,5	15,5	15,2	17,19	16,68	12,31	12,16	15,06	15,00	15,81
For Turkey	11,23	12,99	12,37	13,94	13,71	10,17	9,95	12,02	12,36	13,03
For Greece	2,21	2,42	2,74	3,14	2,85	2,06	2,1	2,9	2,5	2,62
For Macedonia	0,07	0,08	0,08	0,11	0,12	0,08	0,12	0,14	0,14	0,16

The distribution of transit transmission in 2013 by countries is:



3. NATURAL GAS STORAGE

Bulgartransgaz EAD offers natural gas storage services on the basis of a licence No L-214-10/29.11.2006, issued by SEWRC, by using its own underground gas storage (UGS) Chiren located close to the town of Vratsa. The gas storage has 22 exploitation wells, a compressor station with total installed capacity of 10 MW and other technological facilities necessary for ensuring injection, withdrawal and quality of the natural gas stored. The natural gas quantities stored in Chiren UGS cover mainly the seasonal swings in domestic consumption and the cases of amended contracted natural gas supplies.

In 2013, 335 mcm natural gas were injected and 238 mcm withdrawn. Information on the performed injection, withdrawal and storage of natural gas by months is presented in the table below.

Withdrawn and injected natural gas quantities in 2012 and 2013, in mcm				
Month	Withdrawal		Injection	
	2012	2013	2012	2013
January	90	90	-	-
February	80	74	-	-
March	42	42	-	-
April	-	-	-	-
May	2	-	46	56
June	-	-	110	72
July	1	-	32	97
August	10	2	34	71
September	-	-	-	39
October	-	-	-	-
November	50	-	-	-
December	72	30	-	-
Total:	**347**	**238**	**222**	**335**

NATURAL GAS SUPPLY CAPACITY DEMAND SCENARIOS IN THE REPUBLIC OF BULGARIA. SUPPLY SOURCES COVERING DEMAND

1. NATURAL GAS DEMAND

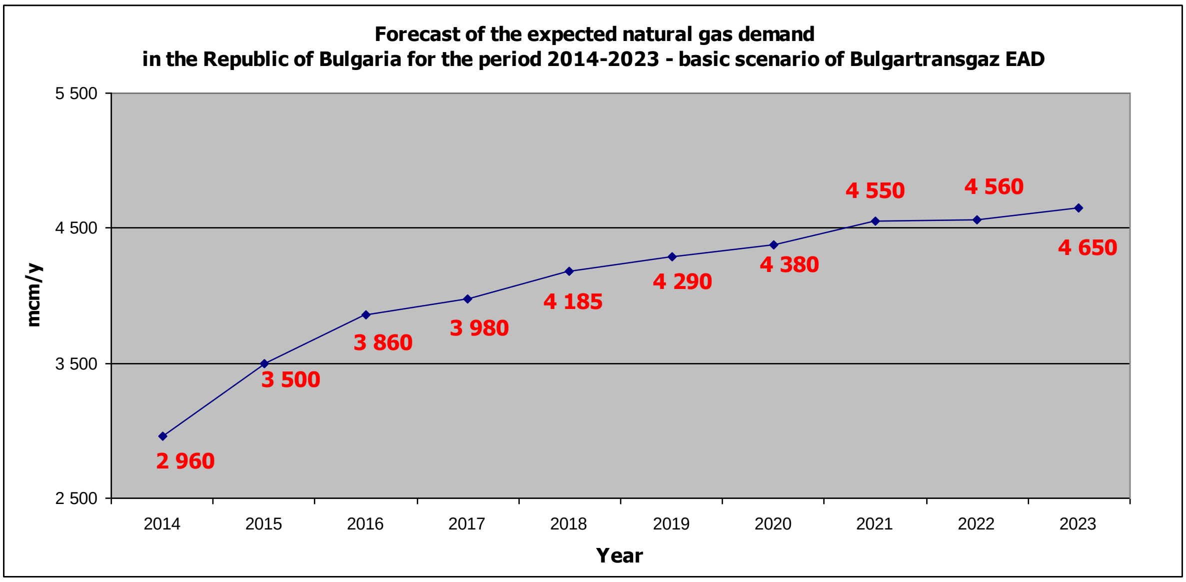
Bulgartransgaz EAD demand scenarios have been developed on the basis of a macroeconomic model showing the dependence of gas consumption on the main macroeconomic indicators, the demand forecasts of the public supplier, the customers' nominations and a comparative analysis of the gas markets in the EU and Bulgaria.

The relationship between the end and primary energy consumption (EEC and PEC) and the GDP growth for past periods[6] has also been analysed.

The main assumptions made based on an analysis of the past ten-year period, a comparative EU gas market analysis and the objectives of the Energy Strategy of Bulgaria[7] are the following:

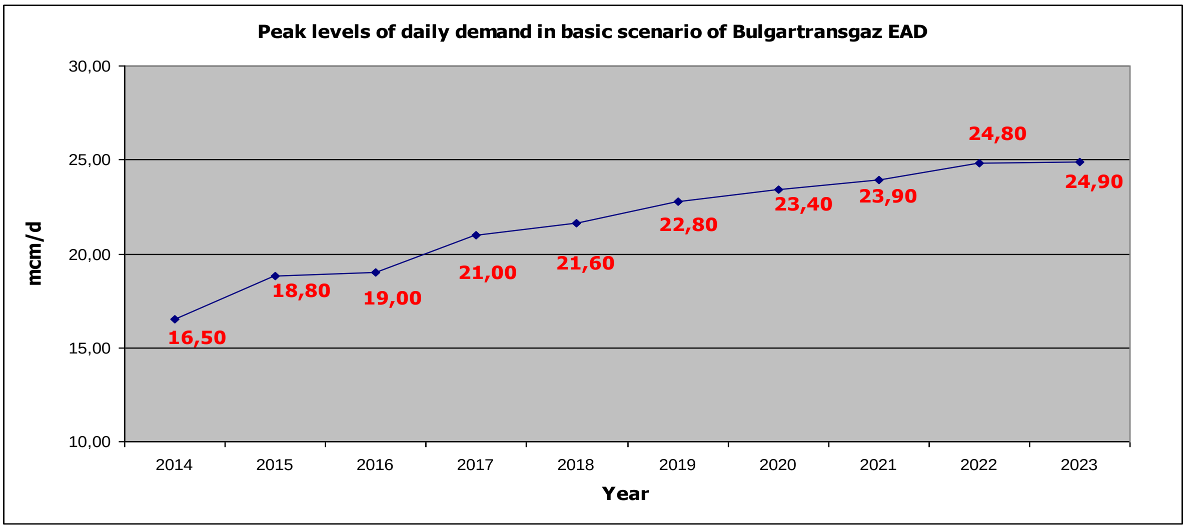
- Sustainable economic growth of GDP - between 2 and 6% annually;
- EEC/PEC ratio reaches up to and above 60% in 2023;
- The share of natural gas in PEC in 2023 for the basic scenario is 19%, compared to 13% in 2012.

The basic scenario, prepared by Bulgartransgaz EAD for the period, as well as the expected peak daily demand levels during the winter months, are according to the diagram below:



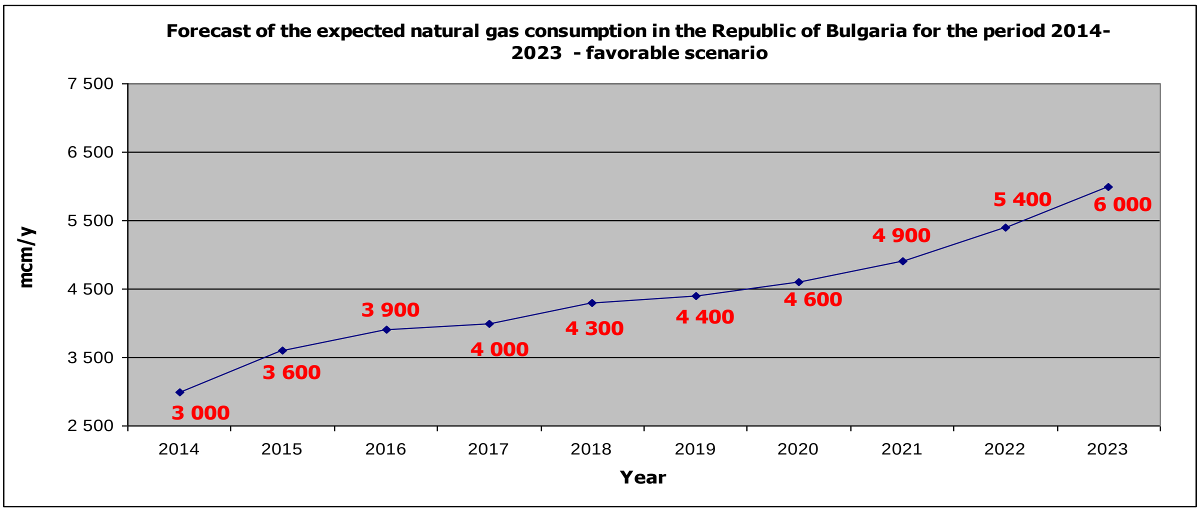
[6] National Statistic Institute, *www.nsi.bg;* Eurostat, www.epp.eurostat.ec.europa.eu

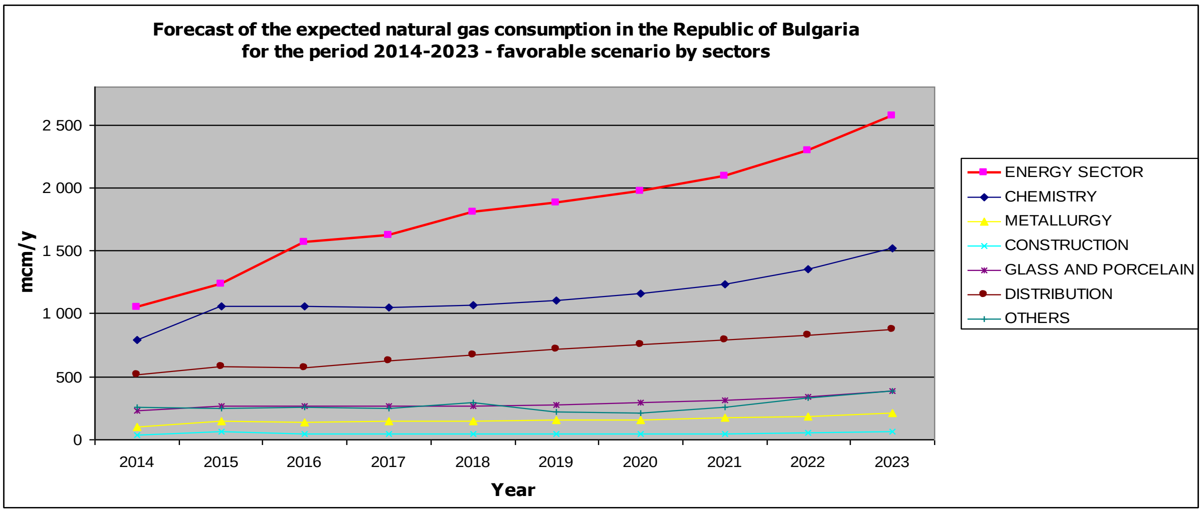
[7] 2020 Energy strategy of the Republic of Bulgaria, www.mi.government.bg



The forecast for the gas demand **favourable scenario** in Bulgaria for the period 2014-2023 is presented in the diagrams below[8].

Forecast of the expected consumption total volume, including by sectors:





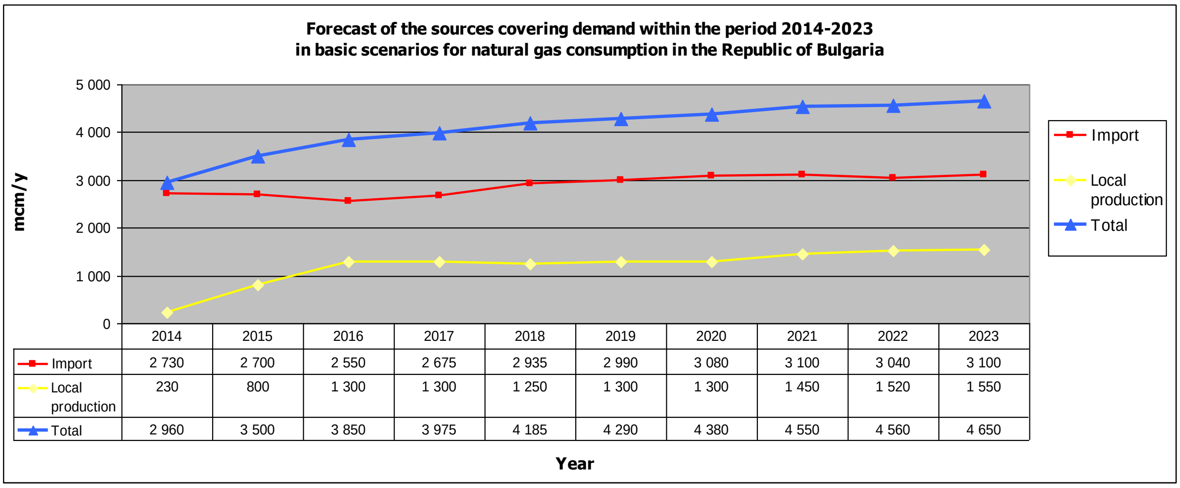
[8] Forecast of the public supplier Bulgargaz EAD on domestic natural gas consumption,

2. SUPPLY SOURCES COVERING DEMAND

In 2013 demand has been satisfied, as follows:

- Imports from the Russian Federation – 2.538 mcm (90.2%);
- Local production – 277 mcm (9.8%).

The forecast for the sources covering demand for the period 2014-2023 for the consumption basic scenario is presented in the diagram below:



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Import	2 730	2 700	2 550	2 675	2 935	2 990	3 080	3 100	3 040	3 100
Local production	230	800	1 300	1 300	1 250	1 300	1 300	1 450	1 520	1 550
Total	2 960	3 500	3 850	3 975	4 185	4 290	4 380	4 550	4 560	4 650

2.1 Import

By 2013 the natural gas imports in the country comes mainly from Russia by a single route - through the territories of Russia, Moldova, Ukraine and Romania. The mix of natural gas imports will be gradually supplemented by new routes and suppliers as a result of the implementation of the projects of the Southern Gas Corridor, the Interconnection with the South Stream project, as well as the Interconnections between Bulgaria and the neighbouring countries.

Basic alternative sources of import expected to become available before the end of the relevant period:

- Gas imports from the Caspian region by the Interconnectors' projects Greece - Bulgaria and Turkey - Bulgaria and respectively their potential connection with the projects TAP and TANAP;
- Gas imports from Greece based on the growing capacity of LNG facilities;
- Gas imports from Central Europe and local production in Romania by using the Interconnector Bulgaria - Romania and the system connectivity between Romania and Hungary;
- Gas imports from Turkey based on the growing potential of LNG facilities by using the Interconnector Turkey - Bulgaria;
- Gas imports from Serbia, depending on the evolution of gas demand and supply on the Serbian market by using the Interconnector Bulgaria - Serbia;
- Gas imports from the existing Interconnection with Greece in compliance with the requirements for permanent bi-directional flow under Regulation (EC) 994/2010.

In the long-term other projects, reflecting the EU priorities, are being considered. One of the potential opportunities under consideration is also the Project of Common Interest (PCI), according to Regulation (EU) 347/2013 for gas pipeline from the Southern gas corridor with route from Bulgaria to Austria via Romania and Hungary with potential capacity of 23 bcm/y.

The interconnection projects' implementation and the increase of natural gas sources from local production will create conditions for real competition on the gas market with possibilities for supplies from alternative sources . In practice, as a result of this, the entry of new market participants - suppliers and shippers can be expected, which will further promote domestic consumption by offering new products and services, as well as competitive prices.

2.2 Local production[9]

The forecast for local production growth is based on the expected increase of natural gas consumption in the country and the region, and the large number of new concessions for exploration of gas fields, as well as the expectations for significant deposits, are focused in particular on the gas fields in the region of the Black Sea.

Forecasts are also based on the expectations for development of the existing gas fields in the country by the following companies:

- Melrose Resources (acquired in 2012 by Petroceltic Ireland) - Block Galata, Kavarna field and Kaliakra field with total gas volume 1.7 bcm and daily production capacity 1.2 mcm/d (440 mcm per year), whereas the capacity for production will begin to gradually decline due to depletion of the gas field (and the respective formation pressure drop);
- Gas-condensate field Koynare of Direct Petroleum (acquired by the Canadian company TransAtlantic), Block 'A- Lovech' including 4 sections. The expected quantities according to the approved investment proposal by the Ministry of Environment and Water amount up to 36 bcm and so far only block 'A- Lovech' has been completely explored with estimated quantity of 13.7 bcm. The expected maximum levels of the other blocks amount to about 22 bcm. (according to preliminary data). The construction of connection between the gas field and Bulgartransgaz EAD national gas transmission network is forthcoming. The expected annual production quantities are up to 1 bcm. The production forecast also includes 800 mcm for 2015 and 1 bcm each year after 2015.

[9] Information about local production is from the webpage of Petroceltic International Plc, as well as from internal company documents and correspondence of Bulgartransgaz EAD with the stakeholders

SECURITY OF SUPPLY

The risk assessment for the period 2014-2023 according to Art. 9 of Regulation (EC) No. 994/2010 of the European Parliament and the Council of October 20, 2010, concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC, was carried out on the basis of:

- Bulgartransgaz EAD demand and peak consumption forecast;
- Natural gas local production forecast;
- New capacities expected following implementation of the new Interconnections with Turkey, Greece, Romania and the South Stream project;
- New capacities planned following optimization of the existing exit points for reverse flow operational regime.

According to Art. 6 of Regulation 994/2010/EC (the Regulation), the N–1 formula describes the capability of the technical capacity of the gas infrastructure to satisfy the total gas demand in the area under calculation in the event of disruption of the single largest gas infrastructure during a day of exceptionally high gas demand occurring with a statistical probability once in 20 years.

As of March 2014, in case of restriction of gas supplies or other crisis situation, the main alternative sources shall be UGS Chiren, local production, as well as the possibility for physical natural gas supplies from Greece to Bulgaria. By the end of 2014, the run into operation of the Interconnection Bulgaria - Romania will be among the essential factors in compliance with the security standard.

By December 3, 2014 at the latest, in the event of a disruption of the single largest gas infrastructure, the capacity of the remaining infrastructure should be able to supply the necessary gas quantities to satisfy the total gas demand in the area under calculation during a day of exceptionally high gas demand occurring with a statistical probability once in 20 years, i.e. N-1>100% according to the following formula:

$$N-1[\%] = \frac{\sum_{m=1}^{7} EP_m + S_{max} + P_{max} - I_{max}}{D_{max}} x100\ , \qquad N-1 \geq 100\ \%$$

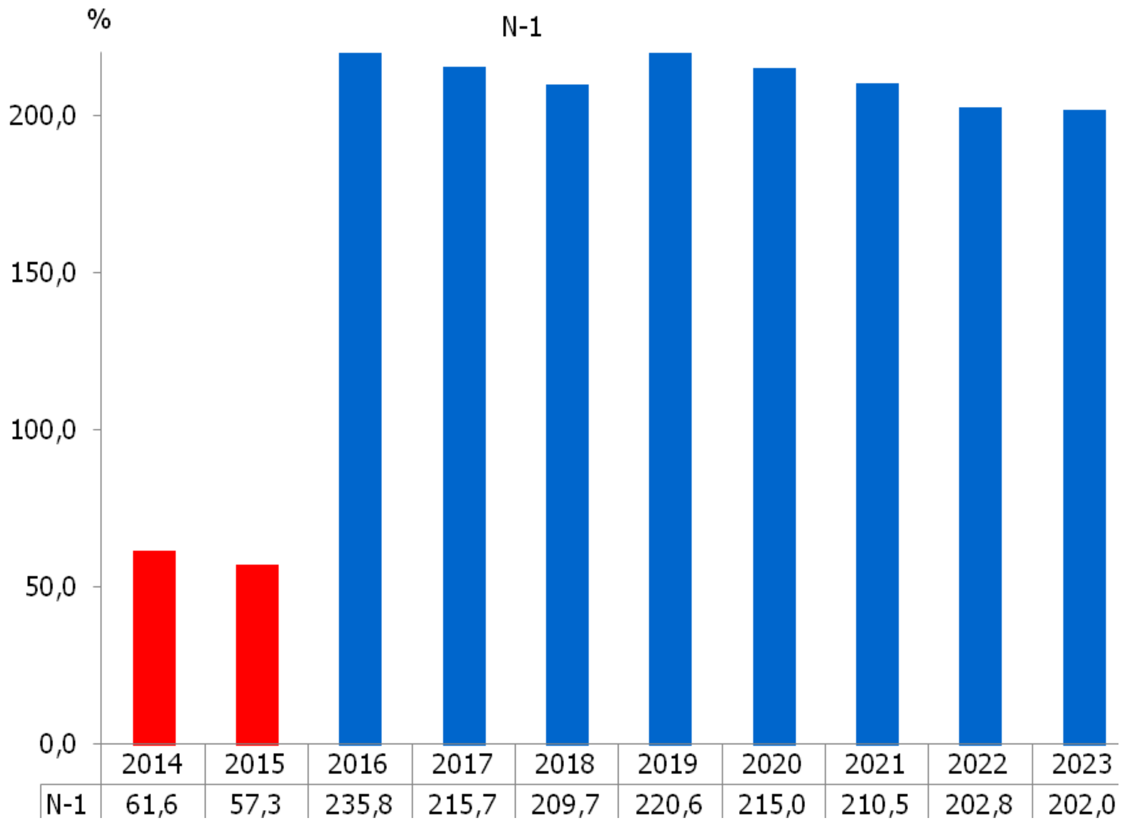
where:

EP_1	Technical capacity of GMS Negru Voda 1
EP_2	Technical capacity of the connection with the South Stream project
EP_3	Technical capacity for import through the Interconnector Greece - Bulgaria and reverse flow from GMS Kulata/Sidirokastro
EP_4	Technical capacity for import through the Interconnector Turkey-Bulgaria
EP_5	Technical capacity for import through the Interconnector Bulgaria-Romania
Smax	Withdrawal from UGS Chiren - maximum possible in mcm/twenty-four hours,
Pmax	National gas production - maximum possible production in mcm/twenty-four hours;
Dmax	National gas consumption - peak consumption in mcm/twenty-four hours;
Imax= EP_1	The single largest gas infrastructure - GMS Negru Voda 1

The results from the N–1 formula, calculated for the territory of the Republic of Bulgaria are as follows:

All capacities listed in this section are in mcm/d.

Year	EP_2	EP_3	EP_4	EP_5	Smax	Pmax	Dmax	Imax= EP_1	N-1
2014	0.00	1.00	0.00	1.37	4.2	3.60	16.50	20.27	61.6
2015	0.00	1.00	0.00	1.37	4.2	4.20	18.80	20.27	57.3
2016	15.00	8.80	8.20	4.10	4.5	4.20	19.00	20.27	235.8
2017	15.00	8.80	8.20	4.10	5	4.20	21.00	20.27	215.7
2018	15.00	8.80	8.20	4.10	5	4.20	21.60	20.27	209.7
2019	15.00	8.80	8.20	4.10	10	4.20	22.80	20.27	220.6
2020	15.00	8.80	8.20	4.10	10	4.20	23.40	20.27	215.0
2021	15.00	8.80	8.20	4.10	10	4.20	23.90	20.27	210.5
2022	15.00	8.80	8.20	4.10	10	4.20	24.80	20.27	202.8
2023	15.00	8.80	8.20	4.10	10	4.20	24.90	20.27	202.0



According to the diagram from 2016 Bulgaria will fulfil the requirements laid down in Regulation (EC) 994/2010 regarding the provision of sufficient capacity of the remaining gas infrastructure in the event of disruption of the single largest gas structure in the day of exceptionally high gas demand occurring with a statistical probability once in 20 years.

The national combined operator Bulgartransgaz EAD shall bear the primary responsibility for the security, reliability, development and free access to the national gas infrastructure - the transmission network for natural gas transportation to customers in the country, the underground natural gas storage and the transmission network which is primarily designated for natural gas transit transmission through the territory of the country. Gas infrastructure status and development are essential prerequisites for development and liberalization of the gas market in the country. In addition, in its capacity of a combined operator in a member-state of the EU, Bulgartransgaz EAD has also obligations under the energy legislation to integrate the national gas transmission system with the regional and the European one in order to create a single, competitive, common European gas market.

The supply and demand analysis, the risk assessment, the requirements of the EU energy legislation and the obligations of the combined operator to the public, determine the necessary investments planned to be made in the period 2014-2022.

The investments provided for the period 2014 - 2023 will contribute to achieving the following key objectives:

1. **Increase and ensure the technical security, safety and reliability of the gas infrastructure, and meet the requirements for environmental protection** with regard to the expected increase in the gas demand in the country and the region by means of:

    - Investments for reconstruction, rehabilitations and overhauls of the transmission networks including investments in the existing compressor stations, linear infrastructure and gas regulation and metering stations and in UGS Chiren.
    - Investments for construction of new facilities to the existing infrastructure necessary for increasing the efficiency of operation.

- Investments in ancillary infrastructure, including the fibre optic network.

2. **Providing opportunity for development of competitive market and diversification** of gas supply sources and routes resulting in greater energy independence, opportunity for local shippers to access gas at various prices and an opportunity to create a regional gas hub, including spot market by means of:
   - Construction of the necessary facilities to connect the existing gas transmission infrastructure with the future trans-European gas corridors South Stream and the Southern Gas Corridor projects (TAP - Trans-Adriatic Pipeline, TANAP – Trans Anatolian Natural Gas Pipeline, as well as other pan European projects) which envisage to ensure diversification of natural gas supply sources and routes and the gas transmission routes to Europe;
   - Connection of the production gas pipeline network of production companies in the country.
   - Development and implementation of electronic systems for operations' control.
   - Construction of the necessary facilities in compliance with the requirements of Regulation (EC) 994/2010 to ensure permanent bi-directional flow of the existing interconnections with Greece and Romania.
3. **Ensuring the security of gas supplies to the country** by means of:
   - Investments in construction of interconnections between the existing gas transmission networks and the gas transmission networks located outside the country.
   - Investments for expansion of the underground gas storage, both regarding the withdrawal and the injection facilities and the capabilities for storage of larger amounts of natural gas.
4. **Access of new municipalities and end users to natural gas**, which will contribute to improving the environmental protection, quality of life, energy efficiency and savings from cheaper fuel by means of:
   - Expansion of the existing gas transmission networks to new regions of the country.
   - Construction of new gas metering and gas regulation stations, providing an opportunity for connection of new end users or gas distribution networks to the gas transmission networks.

This chapter of the TYNDP constitutes structured information about the basic infrastructure planned for construction, expansion, reconstruction and modernization during the next 10 years (2014-2023).

Considering the long-term horizon of investment planning - a ten-year period and its including in the Plan of the projects, which at present have no final investment decision and projects which development is related to the implementation of other international projects in the gas sector, for the purpose of greater clarity the Network Development Plan has been structured into 3 main groups. The particular projects, the schedule of their implementation and the estimated investments' amount are indicated in these groups:

- o Investments on which decision for implementation in the period 2014 - 2016 has already been taken - Projects for development of the gas transmission and storage infrastructure with investment decision already taken - Table 1;
- o Investments which implementation depends on the development of international

projects implemented on the territory of the country - Investments for development of the gas transmission and storage infrastructure depending on the development of international projects and third parties projects in the period 2014 – 2023 – Table 2;

- Projects for development of the gas transmission and storage infrastructure in the period 2014 - 2023 on which no investment decision has been taken but there are investment intentions on their implementation during the 10-year plan period - Table 3;

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

1. NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEVELOPMENT PROJECTS IN THE PERIOD 2014 - 2016 ON WHICH INVESTMENT DECISION HAS BEEN TAKEN

Investments for the more significant projects of the network on which a decision has been taken and which are scheduled for implementation in the period 2014 - 2016, are presented in consolidated form in Table 1. Implementation of some of the projects has commenced before 2014, but work on them will continue also during the period 2014-2016. For such projects only the estimated value of investment during that three-year period is indicated in the Table.

Table 1

Natural gas transmission and storage infrastructure development projects in the period 2014 - 2016 by consolidated projects	Implementation schedule	Estimated value of investment, in thousand BGN
I. 2014-2016 RECONSTRUCTIONS, REHABILITATIONS AND OVERHAULS		
1. Investments in Compressor stations:		
1.1. Gas transmission network for transit transmission		
Actions aimed at compressor stations compliance with the requirements of the complex permits including reconstruction of compressor stations Ihtiman, Petrich, Lozenets, Strandja by integrating low-emission GTCU and retrofitting gas turbine units with low-emission chambers at CSs Provadia, Strandja, Kardam 2.	2014-2016	144 445
Overhauls of gas turbine engines including scheduled repairs and inspections	2014-2016	26 232
1.2. National gas transmission network		
Modernization of automatic control system of GCU and station control system of CS Valchi dol and CS Polski Senovets	2014 - 2016	9 060
Reconstructions and rehabilitations of CS Polski Senovets and CS Valchi dol	2014-2016	7 910
2. Investments in existing AGRSs		
2.1. National gas transmission network		

Natural gas transmission and storage infrastructure development projects in the period 2014 - 2016 by consolidated projects	Implementation schedule	Estimated value of investment, in thousand BGN
Reconstruction and modernization of AGRS, GRS and GMS Devnya, September, Pernik, Ivanyane, Lovech, Shumen, Novi pazar, Isperih, Kubrat, Kremikovski, Butovo, Shumen, Strashimorovo, LV Rosen, etc.	2014-2016	5 169
Construction of new metering lines of GRS Burgas, GRS Lovech, AGRS Sevlievo, AGRS, AGRS Pernik, AGRS Ruse Zapad, etc.	2014-2016	2 007
3. UGS Chiren		
Reconstruction and rehabilitation of above ground facilities	2014 - 2016	1 026
Reconstruction and rehabilitation of drills	2014-2016	14 225
II. INVESTMENTS IN CONSTRUCTION OF NEW FACILITIES TO THE EXISTING INFRASTRUCTURE NECESSARY FOR INCREASING THE EFFICIENCY OF OPERATION		
1. Gas transmission network for transit transmission		
Construction of pigging facilities (launch-receive traps) for gas pipeline sections Kardam - Odrintsi and Rupcha - Lozenets	2014	484
2. National gas transmission network		
Construction of station for metering and regulating natural gas quantities at CS Kardam	2014 - 2016	1 815
Construction of pigging facilities (launch-receive traps) for gas pipeline branches Ruse, Dimitrovgrad, Pleven, Burgas, and Devnia	2014 - 2015	2 927
3. UGS Chiren		
New exploitation well E-72 at Chiren UGS, individual separation and gas gathering to the well	2014-2016	9 730
4. Investments in ancillary networks		
Optical cable main lines: from Botevgrad region to Chiren UGS, from VS Batultsi - VS Nikolaevo – GRS Pleven	2014-2015	3 893
III. PROJECTS FOR PROVIDING CAPABILITY FOR CROSS-BORDER CAPACITY INCREASE		
1. Interconnections		
Interconnection Bulgaria-Romania (Ruse-Giurgiu) - commissioning	2014	2 417
Construction of looping of transit gas pipeline to Turkey in the section CS Lozenets - PF Nedyalsko	2014-2015	32 370
IV. ACCESS OF NEW MUNICIPALITIES AND NEW END USERS TO NATURAL GAS		
1. Investments in projects for expansion of the existing gas transmission networks to new regions of the country		
High-pressure gas pipeline Dobrich-Silistra and AGRS Silistra	2014	2 345

Natural gas transmission and storage infrastructure development projects in the period 2014 - 2016 by consolidated projects	Implementation schedule	Estimated value of investment, in thousand BGN
High-pressure gas pipeline Chiren - Kozloduy - Oryahovo, AGRS Kozloduy and AGRS Oryahovo	2014-2016	9 359
2. Investments for construction of new gas metering and gas regulation stations		
Construction of new GMSs and AGRSs - AGRS Ignatievo, GMS Karnobat, GMS Chirpan, GMS Dermantsi 2, GMS Ihtiman, GMS Razgrad	2014-2015	1 738

Investments which implementation depends on the development of international projects implemented on the territory of the country are presented in Table 2.

2. INVESTMENTS IN THE DEVELOPMENT OF NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEPENDING ON THE DEVELOPMENT OF INTERNATIONAL PROJECTS AND THIRD PARTIES PROJECTS IN THE PERIOD 2014-2023

Table 2

Natural gas transmission and storage infrastructure development projects in the period 2014 - 2023 by consolidated projects	Implementation schedule	Estimated value of investment, in thousand BGN
I. PROJECTS FOR PROVIDING OPPORTUNITY FOR DIVERSIFICATION OF GAS SUPPLY SOURCES AND ROUTES		
1. Investments in the construction of the necessary facilities connecting the existing gas transmission infrastructure with the future cross-border projects for natural gas transportation to EU markets - South Stream		
Connection to South Stream	2016-2017	10 000
2. Interconnections		
Connection to Interconnection Greece-Bulgaria (IGB)	2015-2016	9 690
Connection to Interconnection Bulgaria - Serbia	2015-2016	4 000
Construction of gas pipeline providing the opportunity for natural gas transportation from Turkey to Bulgaria	2015-2017	100 550

3. NATURAL GAS TRANSMISSION AND STORAGE INFRASTRUCTURE DEVELOPMENT PROJECTS IN THE PERIOD 2014 - 2023 ON WHICH FINAL INVESTMENT DECISION IS TO BE TAKEN

Studies should be carried out for the below listed projects (regarding the method of implementation and financing, principal technical solutions, scope, location, etc.) aimed at determining their subsequent implementation.

Table 3

Natural gas transmission and storage infrastructure development projects in the period 2014 - 2023 on which no investment decision has been taken	Forecast implementation period	Estimated value of investment[10] in thousand BGN
1. Gas transmission network for natural gas transit transmission		
Actions aimed at achieving compliance of compressor stations with the requirements of the complex permits, including retrofitting gas turbine units with low-emission chambers	2014-2018	56 050
2. National gas transmission network		
Construction of new gas pipeline branches with AGRS to Svishtov, Panagyurishte and Pirdop, Bansko and Razlog, Sopot and Hisarya, etc.	2014-2019	58 200
Actions aimed at ensuring compressor station Kardam 1 compliance with the requirements of the complex permits - retrofitting gas turbine units with low-emission chambers	2017-2018	6 000
Rehabilitation, modernization and expansion of the existing NGTN, including: • Increase of capacity of the existing network by construction of new sections • Rehabilitation and modernization of compressor capacity	2014-2017	263 327
3. Investments in ancillary networks		
Optical cable main lines: VS Nikolaevo - CS Polsky Senovets, VS Miladinovtsi - CS Valchi dol, CS Polsky Senovets - VS Miladinovtsi - AGRS Tyrgovishte, Dupnitsa - Kulata	2014 - 2016	17 590
4. Storage:		
Expansion of Chiren UGS capacity	2014 - 2018	200 060

4. 2014 – 2023 INVESTMENT PROGRAM

This Section presents the Investment Program of Bulgartransgaz EAD for the period 2014-2023 divided into the following activities:

- **Pre-Investment preparation** – performance of activities and tasks justifying the technical and economic feasibility and ensuring conditions for legitimate realization of the projects planned and included in the long-term investment intentions of the Company, providing for the performance of the following main activities:
  - Examination and justification of the technical and economic feasibility of projects' implementation included in the long-term investment intentions of the Company;

[10] The estimated size of Bulgartransgaz EAD investment by projects for the respective period is specified.

- Justification and specifying of the timing, main technical and economic parameters for the separate investment intentions;
- Study of the opportunities for attracting grant funds from the EC for the separate investment intentions and applying for such grants;
- Specifying the basic regulatory requirements applicable to the respective projects and ensuring their legitimate implementation;
- Preparation of Terms of Reference;
- Feasibility studies and surveys in order to take a decision on the implementation and financing of projects in the medium term.

o **Investments** - actions aimed at expansion, reconstruction, modernization and major repairs, grouped into three main sections;

- Construction of new facilities;
- Reconstruction, modernization and rehabilitation;
- Machinery and equipment.

4.1. Three-year Investment Program (2014-2016) including investment activities on which final investment decision has been taken

in thousand BGN, VAT excluded

Program/Section	Total 2014	Total 2015	Total 2016
TOTAL Annual programs for Pre-Investment preparation and Investments:	109 214	121 708	113 000
TOTAL Annual programs for Pre-Investment preparation:	1 659	1 500	1 200
TOTAL Annual programs for Investments:	107 555	120 208	111 800
SECTION I.1 - Construction of new facilities	25 122	54 091	17 099
Gas transmission network for transit transmission	5 587	29 430	
Pipeline network	3 644	29 210	
Compressor stations, administrative and operating regions	413	20	
Communication and information systems	1 530	200	
National gas transmission network	13 818	12 268	13 269
Pipeline network	7 127	5 157	7 269
Communication and information systems	2 983	3 440	3 500
AGRS and GMS	3 708	3 671	2 500
UGS Chiren	25		
Wells and gas gatherings	2 000	5 700	2 030
Total for distribution by types of activities	3 692	6 693	1 800
Pipeline network	1 220	2 365	200
Compressor stations, administrative and operating regions	1 457	2 713	
Communication and information systems	915	1 615	1 600
Chief Dispatching Division	100		
SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term	73 908	57 690	87 701

Program/Section	Total 2014	Total 2015	Total 2016
tangible assets			
Gas transmission network for transit transmission	62 973	36 719	76 451
Pipeline network	2 091	230	
Compressor stations, administrative and operating regions	60 873	36 489	76 451
Communication and information systems	9		
National gas transmission network	6 234	11 246	7 160
Pipeline network	792	620	620
Compressor stations, administrative and operating regions	2 906	8 822	5 540
AGRS and GMS	2 536	1 804	1000
UGS Chiren	250		
Wells and gas gatherings	1 715	8 520	3 990
Main technological installations and systems, operating unit	521	255	
Total for distribution by types of activities	2 215	950	100
Pipeline network	500	100	100
Compressor stations, administrative and operating regions	195	350	
Communication and information systems	20		
Chief Dispatching Division	1 500	500	
SECTION I.3 -Delivery of machinery and equipment	8 525	8 427	7 000

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4.2. 2017-2023 Investment program, including mandatory investment activities ensuring capacity capabilities of the networks

in thousand BGN, VAT excluded

Program/Section	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023
TOTAL Annual programs for Pre-Investment preparation and Investments:	33 908	34 356	31 300	32 490	33 600	34 400	35 304
TOTAL Annual programs for Pre-Investment preparation:	1 200	1 300	1 250	1 300	1 300	1 300	1 300
TOTAL Annual programs for Investments:	32 708	33 056	30 050	31 190	32 300	33 100	34 004
SECTION I.1 - Construction of new facilities	9 765	8 873	9 750	10 250	10 800	11 300	11 817
Gas transmission network for transit transmission	2 795	2 950	3 250	3 400	3 600	3 800	4 013
National gas transmission network	3 841	4 025	4 450	4 650	4 900	5 100	5 304
Natural gas storage	0	0	0	0	0	0	0
Total for distribution by types of activities	3 129	1 898	2 100	2 200	2 300	2 400	2 500
SECTION I.2 - Reconstruction, rehabilitation and overhauls of long-term tangible assets	15 443	16 183	17 200	17 740	18 300	18 600	18 987
Gas transmission network for transit transmission	9 710	10 130	10 500	10 700	10 900	11 000	11 200
National gas transmission network	3 518	3 673	4 050	4 250	4 500	4 600	4 692
Natural gas storage	600	700	800	840	850	900	953
Total for distribution by types of activities	1 615	1 680	1 850	1 950	2 050	2 100	2 142
SECTION I.3 - Supply of machinery and equipment	7 500	8 000	3 100	3 200	3 200	3 200	3 200

4.3. 2014 - 2023 Investment program, including investment activities on which final investment decision is to be taken

in thousand BGN, VAT excluded

	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023
TOTAL	**1 659**	**136 840**	**192 865**	**189 310**	**198 210**	**102 000**	**73 000**	**72 000**	**42 000**	**42 000**
Gas transmission network for transit transmission	685	89 585	82 710	124 000	124 000	30 000	10 000	10 000	10 000	10 000
National gas transmission network	874	15 755	68 655	4 110	3 010	70 000	60 000	60 000	30 000	30 000
UGS Chiren	60	30 000	40 000	60 000	70 000	1 000	1 000	1 000	1 000	1 000
Others	40	1 500	1 500	1 200	1 200	1 000	2 000	1 000	1 000	1 000

5. DESCRIPTION OF KEY PROJECTS

In the context of European objectives to build interconnected and single European gas market, the development of infrastructure in Bulgaria is directly linked to the positioning of the country as one of the gas hubs in Eastern Europe in line with the projects for Southern Gas Corridor development and the plans for development of gas infrastructure in the region and Europe. The strategic objectives to improve the security of supply and the diversification of gas supply sources occupy a central place in the European energy policy.

New interconnections with Turkey, Greece, Serbia and Romania as well as the connection with the South Stream project and the Southern Gas Corridor projects are key to market integration in the region. These projects will contribute to securing natural gas supply to our country and the region creating the real conditions to diversifying the sources and the routes and enabling the transport of additional quantities of natural gas to and through Bulgaria.

The regional gas network development is closely interrelated with the plans to expand the storage capacity of the underground gas storage that is currently the only one in Bulgaria - Chiren UGS to accommodate the provision of services to the national and regional market and the project on modernization and rehabilitation of existing natural gas transmission infrastructure to boost its efficiency and reliability. Storage capacity can be further expanded with the construction of new gas storage in the country.

The implementation of all these projects is interrelated and aims at contributing to the efficiency and the development of the common European gas network. Their importance is highly appreciated by the European Commission who determined the Bulgarian gas infrastructure development projects to be projects of common interest in line with Regulation EC 347/2013.

The PCIs list[11]as published by the EC on 14.10.2013 includes 8 infrastructure projects planned for construction on the territory on Bulgaria: Rehabilitation and modernization of the existing gas transmission network, Interconnection Greece-Bulgaria (IGB), the Project to provide bi-directional capacity at the existing interconnection point between Greece and Bulgaria – Kulata/Sidirokasto, the Interconnection Bulgaria-Serbia, the Project to increase the transmission capacity to Greece, the Project to expand the capacity of Chiren UGS, the Project to build new gas storage on the territory of Bulgaria and the Interconnection Turkey-Bulgaria (ITB).

5.1 Connection with pan-European projects

5.1.1. Interconnection of Bulgartransgaz EAD gas transmission network with the South Stream project

South Stream gas pipeline is expected to cross the territory of Bulgaria and supply gas to the European market and the Bulgarian market as well.

A route option for the territory of Bulgaria is chosen and its interconnection point with Bulgartarnsgaz EAD gas transmission networks is set - entry point in the area of CS Provadia with two branches to the national gas transmission network (NGTN) and the gas transmission network for transit transmission (GTNTT) with capacity as follows:

- NGTN maximum capacity 1,6 bcm/y

[11] Official list of the Projects of Common Interest, the webpage of the European Commission, Directorate Energy

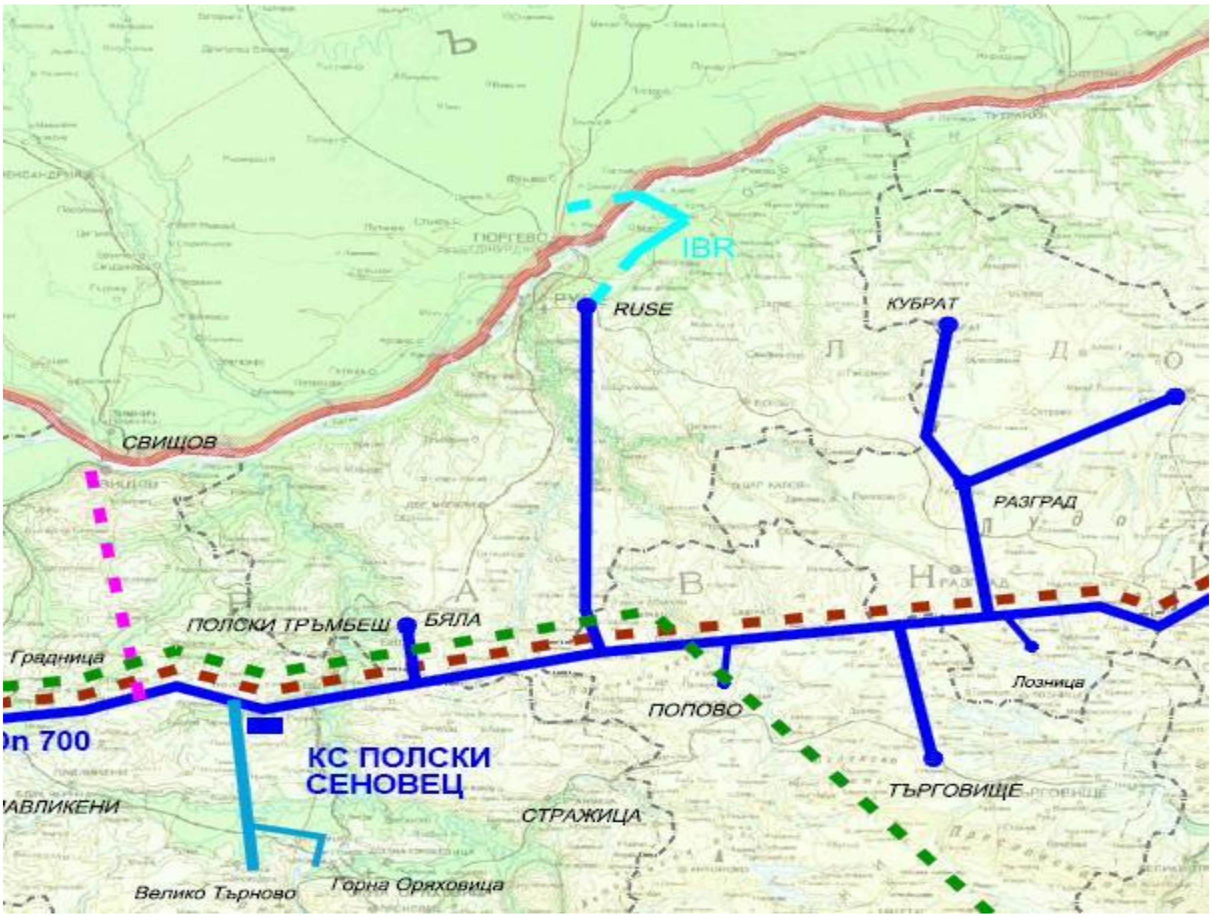
- GTNTT maximum capacity between 20 and 22 bcm/y

The connection with the gas transmission network for transit transmission is scheduled for 2016, and the connection with the national gas transmission network - for 2017.

A project company South Stream Bulgaria AD has been established to deal with the construction of the South Stream on the territory of Bulgaria; the expectations are the company to be the operator of the gas pipeline as well.

5.2 New interconnections with the neighbouring countries

5.2.1 Interconnection Bulgaria-Romania (IBR)



The reverse flow interconnection Bulgaria–Romania aims at connecting the national gas transmission networks of Bulgaria and Romania. The project realization will achieve diversification of routes, interconnection and natural gas transmission to Romania using the planned new entry points with Turkey and Greece and the significant capacity available in the gas transmission system. Natural gas sourced from Romania can be supplied through the interconnection as well.

The project is being jointly implemented by Bulgartarnsgaz EAD and Transgaz S.A. in line with the Memorandum on Understanding signed on 01.06.2009 г.

The forecast total value of the project is set to 23, 823 million euro. In line with EC Decision C(2010)5962 of 06.09.2010 both companies are the Beneficiaries of a grant under the European Energy Programme for Recovery (EEPR) in the amount of 8,9 million euro.

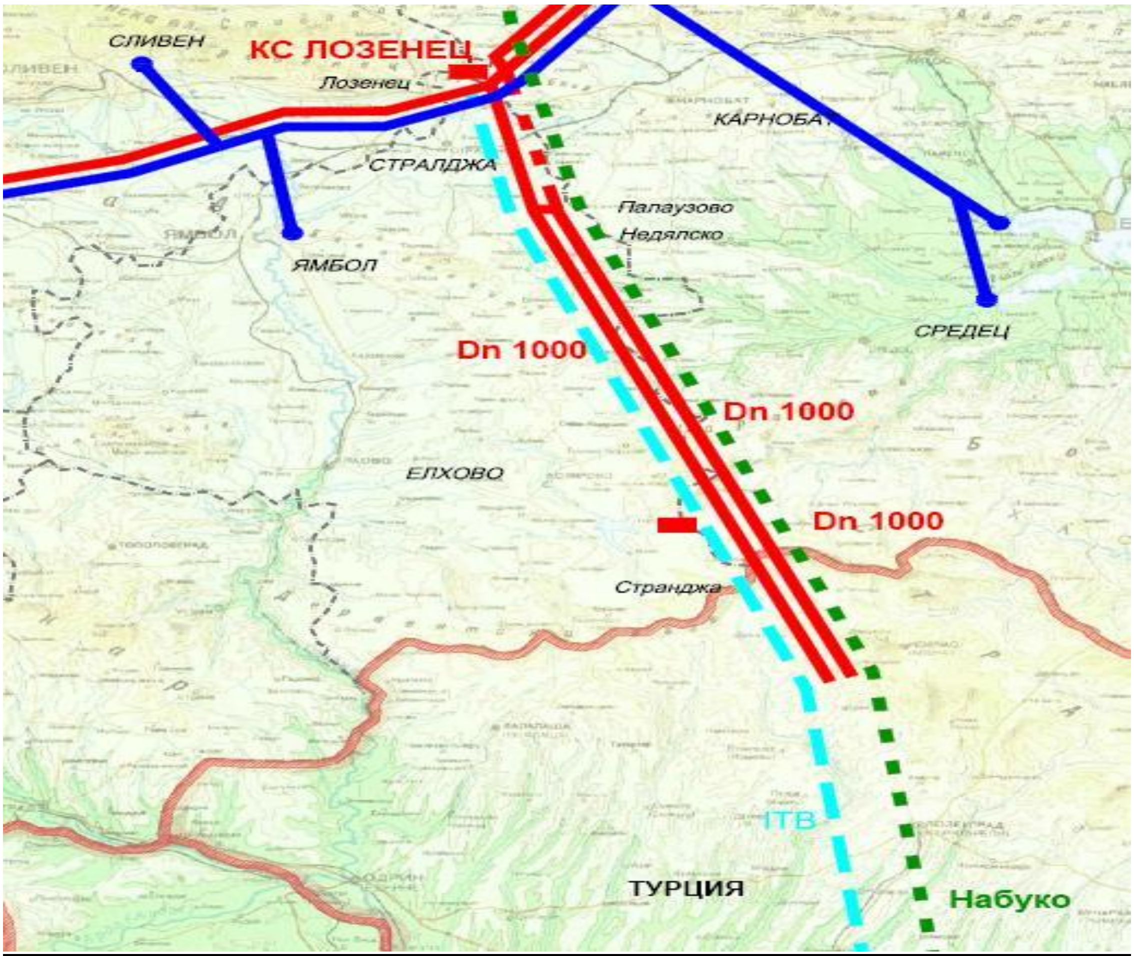
The reverse flow interconnection is 25 km long of which 15 km on the Bulgarian territory, 7.5 km on the Romanian territory and 2.5 km of underwater crossing through the Danube river.

The maximum capacity of the interconnection is 1,5 bcm/y (in the direction from the Republic of Bulgaria to Romania), and the minimum is 0,5 bcm/y (in the direction from Romania to Bulgaria); the diameter of the pipe is Dn 500 mm and the operating pressure is Pn 50 bar.

The project is split in three parts: the underwater section crossing Danube, terrestrial section on Bulgarian territory and terrestrial section on Romanian territory.

The gas pipeline is scheduled to be constructed and run into operation in 2014.

5.2.2 Interconnection Turkey – Bulgaria (ITB)



The Interconnection Turkey - Bulgaria (ITB) is a key project for the security and diversification of gas supply not only to Bulgaria, but the region as well. Its implementation will allow to comply with the requirements of the Regulation of the EC on the security of gas supply 994/2010 and to achieve a significant diversification of natural gas supply sources and routes to/through Bulgaria and the region. The project's implementation is also directly connected with achieving the conditions required for the establishment of a competitive gas market.

ITB can secure access to the Bulgarian transmission system to all current and future entry points and sources of Turkey – Azerbaijan and other natural gas and LNG spot supplies from existing terminals in Turkey. A considerably higher security of supply to our country can thus be ensured as well as compliance with N-1 security standard.

Assessing the benefits from the realisation of the Interconnection Turkey - Bulgaria, the European Commission determined it to be on the Bulgarian gas projects of common interest according to Regulation (EC) 347/2013.

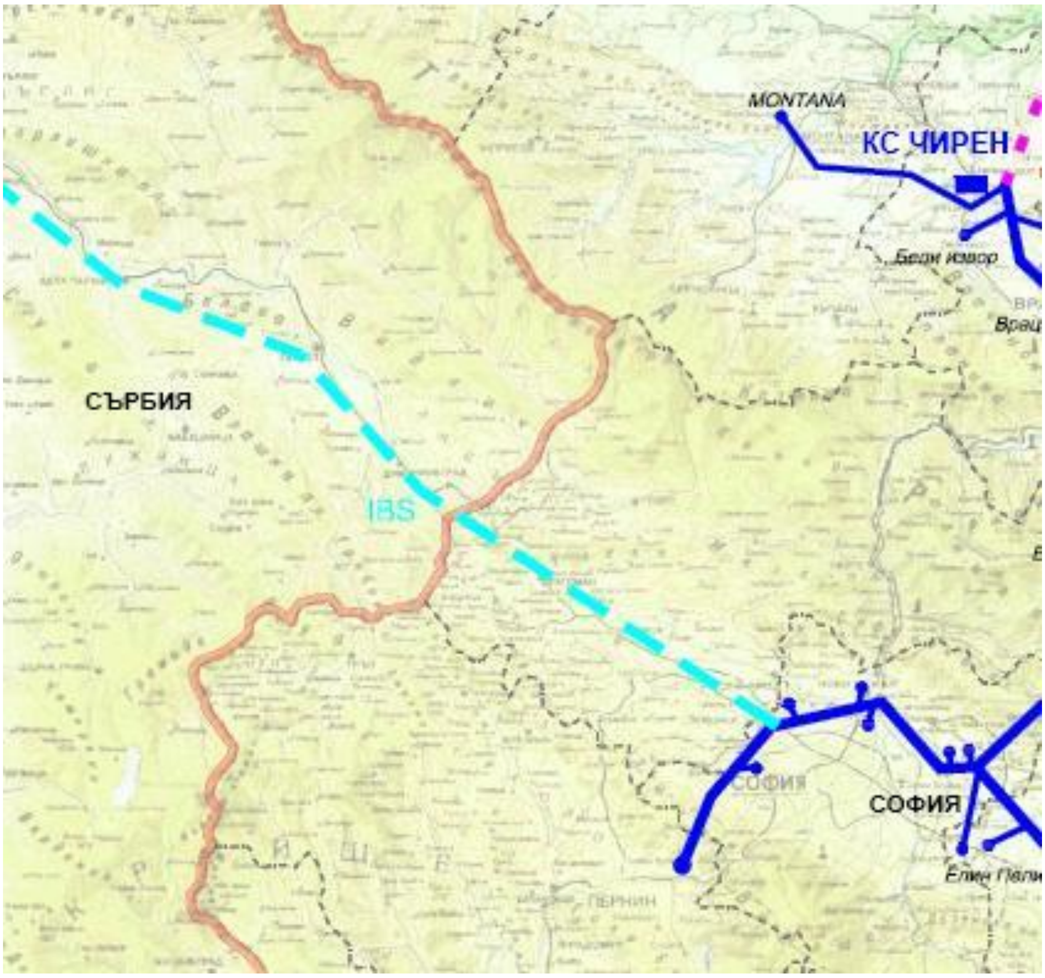
The interconnection is intended to be constructed as a further development of the existing system interconnection of Bulgartransgaz EAD and Botas SA systems – Turkey and a technical possibility will be available for reverse flow depending on market interest.

The project will be implemented by Bulgartarnsgaz EAD on the Bulgarian territory. Construction of additional gas transmission infrastructure in the section between CS Lozenets and the Bulgarian-Turkish border running in parallel to the existing transit gas line will be built with a maximum length of about 75 km and capacity of about 3 bcm/y.

The project may be realised in stages. The first stage is thought to be the construction of 20 km gas pipeline in the section CS Lozenets – PF Nedialsko now under design. The expected time of implementation of this stage is by the end of 2015.

The interconnection is expected to connect on Turkish territory with Botas gas transmission network in the gas pipeline section Onerler - Sarkoy. The approximate length of the route is around 120 кm to be built by the Turkish side.

5.2.3 Interconnection Bulgaria-Serbia (IBS)



The Interconnection Bulgaria-Serbia aims at connecting the national gas transmission networks of Bulgaria and Serbia. The project is realised by the Ministry of Economy and Energy in its capacity of a Beneficiary under a procedure of financial aid within Operational

Programme Development of the Competitiveness of the Bulgarian Economy 2007 – 2013, and Bulgartransgaz EAD extends expert and technical assistance.

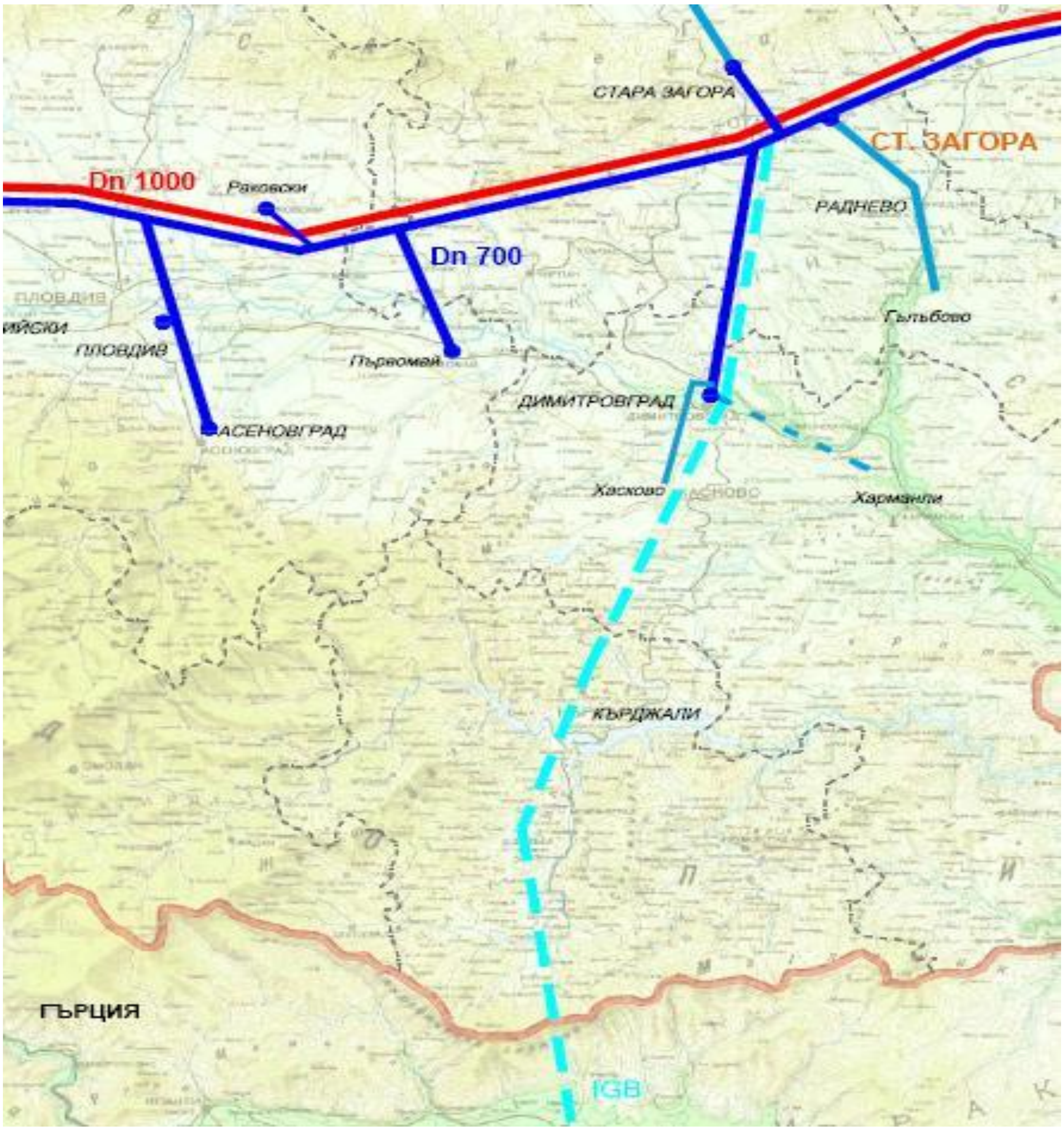
The project's realization will achieve diversification of routes, interconnection and natural gas transmission to Serbia using the planned new entry points with Turkey and Greece and the significant available capacity of the Bulgarian gas transmission system. At the same time, in crises it could be used for natural gas supply from Serbia.

In line with Regulation (EC) 347/2013 the Interconnection is one of the Bulgarian project of common interest.

According to preliminary technical information the length of the route Sofia - Dimitrovgrad - Nis is about 150 km of which about 62 km on Bulgarian territory. Design minimum annual capacity is around 1,8 bcm, and the maximum is 3,1 bcm.

The end of the construction is expected to be completed in 2016.

5.2.4 Interconnection Greece-Bulgaria (IGB)



The Interconnection Greece-Bulgaria is designed to transport gas between Greece and Bulgaria whereas the interconnection with Bulgartransgaz EAD national gas transmission network will be close to the city of Stara Zagora and with DESFA S.A. gas transmission network - in the region of Komotini. The project is developed by a joint investment company ICGB AD with shareholders Bulgarian Energy Holding EAD (50 %) and the Greek investment company IGI Poseidon (50%). Shareholders with equal stakes in IGI Poseidon are DEPA, Greece and Edison, Italy.

Co-financing is secured for the project under the European Energy Programme for Recovery in the form of financial aid. A mandate letter with the European Bank for Recovery and Development (EBRD) for the start of negotiations with a view to the financing of the constriction stage has been signed.

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). Gas pipeline technical capacity is up to 3 bcm/y with an opportunity for increase up to 5 bcm/y with the construction of a compressor station.

Branches on the territory of Bulgaria to the area of the towns of Kardjali and Dimitrovgrad are envisaged.

An opportunity to connect IGB with TAP and DESFA S.A. gas transmission network on the territory of Greece is considered in connection with the development of the Southern Gas Corridor.

In line with Regulation (EC) 347/2013 the Interconnection Greece - Bulgaria is announced to be project of common interest.

The interconnection is expected to be constructed in 2016.

5.3. Increase of natural gas storage capacity

5.3.1 Expansion of UGS Chiren capacity

The project for expansion of the existing gas storage Chiren UGS provides for storage capacity staged increase – larger stored gas volumes, increased gas reservoir pressures and higher daily average deliverability and injection rates.

In line with Regulation (EC) 347/2013 the project for the expansion of Chiren UGS capacity is announced to be project of common interest.

The project's realization will enhance security of supply to the region and will implement the N-1 standard on one hand , and on the other will contribute to natural gas trade development in the region.

According to the Technological Design completed in 2011 there are various possibilities for expansion of Chiren UGS capacity by gradually reaching the operating pressure of the reservoir from the current 110 bar to 150 bar. This upper limit has been determined based on the analysis of information available on the reservoir and the shielding rocks. In carrying out the necessary additional studies (geomechanical simulation, 3D seismic survey, ground gas analysis), it will be possible to accurately determine the technological options for expansion, including the maximum operating pressure.

All specific expansion parameters depend completely on the outcome of the market survey and on the planned feasibility study. Assessment of market interest is expected at the end of 2014 when the activities within the Open Season process are scheduled to be completed. The market survey process complies with the European requirements for market-based evaluation of the need of important investments in natural gas transmission and storage. Its first phase has been launched on 27.01.2014.

5.3.2 Opportunities for new gas storages in Bulgaria

A couple of potential opportunities for the construction of new gas storage in Bulgaria are reviewed whereas the main objective is to ensure the security of supply and encourage the gas market liberalization. Ensuring additional storage capacity is important particularly for the expected additional quantities from the Caspian region, LNG terminals in the region and other supply sources. The new gas storage is expected to serve not only the national, but also the regional gas market after the planned construction of the new interconnections with neighbouring countries. It could be constructed in suitable geological structure – salt caverns, depleted gas field (onshore or offshore) or aquifer.

The need of increasing storage capacity in Bulgaria and the region of South-eastern Europe has been identified by the European Commission and the project for the construction of new gas storage on the territory of Bulgaria has been announced in Regulation (EU) No 1391/2013 on guidelines for trans-European energy infrastructure as regards the Union list of projects of common interest.

5.4 Development of the existing network by the construction of new gas pipeline branches

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

5.4.1 Projects in progress

- **Construction of gas transmission pipeline to Silistra**

The gas pipeline from the town of Dobrich to the town of Silistra is under construction and is scheduled to be completed within 2014. It's length is 80 km, diameter 350 mm, working pressure Pn 54 bar and transmission capacity of 100 000 m3/h. The project also consists of AGRS construction in the western industrial zone of Silistra.

Bulgartransgaz EAD is an investor of the project.

The Italian company S.A.L.P. SpA is Contractor of the construction and installation works of the project.

The project is funded by a grant under Kozloduy International Decommissioning Support Fund (KIDSF) to the amount of € 9.214 million. Bulgartransgaz EAD co-financing amounts to € 3.070.000. The European Bank for Reconstruction and Development is an administrator of KIDSF.

The gas pipeline from Dobrich to Silistra will enable gasification of the municipalities along the gas pipeline route: Dobrich, Tervel, Dulovo, Alfatar, Silistra. It is of particular importance also for the development of local economy. The potential industrial users only for the town of Silistra are twenty-six. The potential public users - hospitals, schools, etc. are over sixty.

The gas pipeline is planned to be run into operation in 2014.

- **Construction of gas transmission pipeline to Kozloduy and Oryahovo**

Construction of 50 km high-pressure gas pipeline from Chiren to Kozloduy with a diameter of 355.6 mm and 15 km gas pipeline from Kozloduy to Oryahovo with a diameter of 150 mm, two automatic gas regulation stations (AGRSs) in Kozloduy with a capacity of 40 000 m3/h and in Oryahovo - with capacity of 5000 m3/h.

Bulgartransgaz EAD is an investor of the project.

The project is funded by a grant under Kozloduy International Decommissioning Support Fund (KIDSF) to the amount of € 10.200.000 million. Bulgartransgaz EAD co-financing amounts to € 4.380.000. The European Bank for Reconstruction and Development is an administrator of KIDSF.

The benefits of project implementation are related to the creation of conditions for development of the local industry and gas supply in the region. This will enable business and population to achieve sustainability, long-term planning and reduction of energy costs.

Gas pipelines are scheduled to become operational in 2016.

5.4.2 Envisaged possibilities for construction of new gas pipeline branches

- **Gas pipeline branch Bansko - Razlog**

The gas pipeline expected length is 40 km, maximum flow rate 32 000 m3/h and diameter DN 273 mm. The gas pipeline route is envisaged to pass along the northern slopes of the Pirin Mountains and cross road No. 19 Simitly - Razlog before resort Predela, continue along the southern slopes of the Rila Mountains to AGRS Razlog, then to the south, cross road No. 19 Simitly-Razlog and reach AGRS Bansko.

- **Gas pipeline branch Panagiurishte - Pirdop**

The gas pipeline length is planned to be about 46 km, maximum capacity 25 000 m3/h and diameter DN 273 mm. The route of the gas pipeline branch is as follows: from Valve Station (VS), located at MGP (main gas pipeline) South semi-ring to AGRS near the town of Panagiurishte and route from the town of Panagiuriste to the town of Pirdop and the town of Zlatitza and AGRS to south of them.

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

The gas pipeline expected length is 36 km, diameter DN 200 mm and working pressure PN 54 bar. Power supply will be provided from the existing main gas pipeline, Northern semi-ring, from the Valve Station near the village of Patresh. Then the gas pipeline branch will reach AGRS, which will be located to the south of the town of Svishtov.

- **Gas pipeline branch to the towns of Sopot and Hisarya**

The gas pipeline expected length is 54 km, 22 km of which with diameter DN 200 mm and 32 km DN 150 mm. Power supply will be provided from the existing main gas pipeline, Southern semi-ring, to the west of Plovdiv-Karlovo road. Then the gas pipeline branch will reach AGRS near Hisarya and AGRS near Sopot. In addition to these municipalities, the branch will supply gas also to the village of Banya and the town of Karlovo.

The above described projects for new gas pipeline branches are at the stage of feasibility studies and will be subject to research activities to determine the scope, manner of execution, financing and making a final investment decision. The deadlines for their implementation depend mostly on the assessment of their feasibility, considering also their social effect.

5.5. Major reconstructions, rehabilitations and overhauls of gas infrastructure

5.5.1 Modernization of Compressor Stations Strandja, Lozenets, Petrich and Ihtiman

The modernization of four of the compressor stations of Bulgartransgaz EAD gas transmission network for transit transmission is a key project, ensuring effective and environmentally sound natural gas transportation. The large-scale project invested by Bulgartransgaz EAD enables the integration of low-emission gas turbine units, according to the European environmental legislation.

The scope of modernization consists of design, supply, installation and commissioning of six sets of gas turbine units, modernization and expansion of the existing power supply systems, the automatic control systems of compressor stations and all other ancillary equipment.

The following compressor stations are subject to modernization:

- CS Strandja - installation of two new gas turbine compressor units (GTCUs);
- CS Lozenets - installation of two new GTCUs;
- CS Petrich - installation of one new GTCU;
- CS Ihtiman - installation of one new GTCU;

The deadline for commissioning of the upgraded compressor stations is the end of 2015.

5.5.2 Modernization of GCU existing automatic control systems (ACSs) and the station control system AT CS Valchi dol and CS Polski Senovets

The objective of modernization is replacement of the existing automatic control systems of each GCU and the station control systems at CS Valchi dol and CS Polski Senovets with new ones, based on new modern technologies and components.

The upgraded control systems must enable GCU and CS control from the control room and reduce to a minimum the presence of any staff in the gas compressor unit machine room. Therefore new uniform independent automatic control systems of GCU in compressor stations and new station control systems for CS operation must be built.

As of March, 2013 a public procurement on the selection of contractor of the engineering works is ongoing.

5.6. Construction of pigging facilities (launch and receive traps) for gas pipeline sections Kardam - Odrintsy and Rupcha - Lozenets

The construction of launch traps at PF near CS Kardam, the village of Rupcha and receive traps near the village of Odrintsi and CS Lozenets will contribute to achieving the calculated throughput capacity of Transit Gas Pieplien No 2 – the Gas Pipeline starting at CS Kardam to Odrintsi and Gas Pipeline starting at Lyulyakovo to CS Lozenets ensuring the technical possibility for regular cleaning and in-line inspections to track the actual operating state of the transmission gas pipelines without any need of gas flow interruption.

5.7. Construction of Transit Gas Pipeline to Turkey (looping) in the section CS Lozenets - PF Nedyalsko

The expansion of the transit gas pipeline to Turkey in the section between Compressor station Lozenets and Pigging facility Nedyalsko is key to the development of the existing Interconnection between Bulgaria and Turkey. The construction of the 20 km gas pipeline section in the section CS Lozenets - PF Nedyalsko is directly related to increasing the security of Bulgartransgaz EAD transmission system and will enable the transmission of additional quantities of gas through the transit gas pipeline in the section between CS Lozenets and the Bulgarian -Turkish border. Looping construction is a technical prerequisite for the implementation of reverse flow, if necessary. Moreover, its implementation will create technical capabilities of system flexibility under various operations and modes, including the launch of cleaning devices and intelligent tools, carrying out repair works on gas pipelines without limitations on natural gas transit, improved hydraulics of the system.

The section can be considered as a first stage of Interconnection Bulgaria - Turkey.

The project is planned to be run into operation by the end of 2015.

5.8. Laying of fibre optic network: from Ihtiman CS to Dupnitsa GMS Botevgrad-Chiren, Batultsi-Nikolaevo-Pleven

Laying of fibre optic network aims at increasing significantly the speed, quality and reliability of the communication with Bulgartransgaz EAD technological equipment along the route of the transmission pipelines thus creating the technical possibility for the IP realization IP - networks to carry technological information (including if needed the establishment of connection of modern permanent monitoring and security systems, remote control, etc.)

The main parameters of some of the expected new projects, including the expected value, capacities and third party projects are given in Appendix 1.

5.9. Interconnections between the national gas transmission network and the gas transmission network for transit transmission

Actions have been undertaken to allow a more efficient use of the overall technical capacity of Bulgartransgaz EAD gas transmission network targeted at the construction of technological connections and measuring stations between the national gas transmission network and the gas transmission network for transit transmission at three locations – close to Ihtiman CS, Lozenets CS and Kardam CS.

The technological connection near Ihtiman CS is in service from the beginning of 2014.

The capacity of the technological connections near near Lozenets CS and Kardam CS is of 7,2 mcm/d and the connections are scheduled to become operational at the beginning of 2015 and 2016 respectively.

The project implementation will enable transportation of natural gas from the national gas transmission network to the gas transmission network for transit transmission and vice versa and metering of the transported natural gas quantities.

BULGARTRANSGAZ

CAPACITY UTILIZATION OF BULGARTRANSGAZ EAD GAS INFRASTRUCTURE WITH REGARD TO THE NETWORKS' DEVELOPMENT PROJECTS PLANNED WITHIN THE PERIOD 2014-2023

This section of the Ten-year network development plan aims at displaying various scenarios for utilization of the gas transmission networks' capacity owned by Bulgartransgaz EAD regarding the infrastructure projects scheduled for 2014-2023 and forecasts for natural gas market development of in the country and the region, as specified in the previous sections.

Scenarios consider the options for natural gas flows transportation through the networks including those on a commercial basis backhaul, ensured by the capacities of the existing and the new entry/exit points. The possibility of gas transportation has been considered both in North-South direction (current status) and in the opposite direction (following projects' realization).

The diversification of entry and exit points where natural gas will be input and off-take from the network will create opportunities for increasing the capacity utilization of existing networks.

The new entry points are prerequisites both for physical networks' load (transport of new quantities of natural gas) and to increase the flexibility of networks by providing backhaul capacity.

Entry and exit network capacity utilization depends on actual natural gas flows which can be provided (supplied) to Bulgartransgaz EAD network from different gas producing regions. As far as is at present there are still ongoing processes of specification of the regions and the routes for natural gas supplies to the territory of Bulgaria, many options are possible about the degree of utilization of Bulgartransgaz EAD gas transmission networks.

The activities of the Company planned for the period 2014-2023 aim at providing adequate infrastructure enabling gas flows receipt supplied by various regions and providing opportunity for gas exit from the networks towards the neighbouring countries. Bulgartransgaz EAD will provide the necessary cross-border capacity that would enable diversity of the directions of the natural gas flow through the networks, but the actual utilization of that capacity and the particular directions of the flows depend on the expectations for the gas market development in Europe and in the country.

1. CAPACITIES DEVELOPMENT OF THE GAS TRANSMISSION INFRASTRUCTURES IN THE COUNTRY

Table 1.1 -1.3 shows the forecasts for capacity development involving long-term services at entry and exit points to/from Bulgartransgaz EAD gas transmission networks by the end of 2014, within 2015 - 2017 and beyond 2017.

Table 1.1 - Capacities for long-term services of Bulgartransgaz EAD gas transmission networks by the end of 2014.

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	Exit capacity mcm/day
Entry-exit zone - national gas transmission network		

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	**Exit capacity mcm/day**
Romania IP Negru voda 1	firm - 20.27 interruptible - 2	-
NGTN - exit capacity zone Bulgaria	-	firm - 14.4 interruptible - 20
Interconnection Bulgaria-Romania (IBR)	firm - up to 1.52	firm - up to 4.56
GMS Provadia (local production)	firm - 2 interruptible - 0.4	-
Intrazone connection - GMS Ihtiman	firm - 0 interruptible - 3	firm - 3 interruptible - 0
Underground gas storage Chiren	firm - 4.20 interruptible - 0.4	firm - up to 4.20 interruptible - 0.4
Maximum interruptible capacity on commercial basis (backhaul)***		
Romania IP Negru voda 1	-	up to 20,27
Entry-exit zone - gas transmission network for transit transmission		
Romania GMS Negru voda 2.3	firm - 58.25 interruptible - 2	-
GTNTT - exit capacity zone Bulgaria		firm - 0.1 interruptible - 2.4
Greece IP Kula/Sidirokastro	firm - 1* interruptible - 2*	firm - 10.27 interruptible - 1.9
Turkey IP Malkoclar	-	firm - 45.12 interruptible - 0
Macedonia IP Jidilovo	-	firm - 2.58 interruptible - 0.6
Intrazone connection - GMS Ihtiman	firm - 3 interruptible - 0	firm - 0 interruptible - 3
Maximum interruptible capacity on commercial basis (backhaul)***		
Greece IP Kula/Sidirokastro	up to 12	-

Table 1.2 - Capacities for long-term services of Bulgartransgaz EAD gas transmission networks within 2015 - 2017.

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	**Exit capacity mcm/day**
Entry-exit zone - national gas transmission network		
Romania IP Negru voda 1	firm - 20.27 interruptible - 2	firm - 0 interruptible -12.0*
NGTN - exit capacity zone Bulgaria	-	firm - up to 14.4 interruptible - 20

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	Exit capacity mcm/day
Interconnection Bulgaria-Romania (IBR)	firm - up to 4.56	firm - up to 4.56
Interconnection Greece-Bulgaria (IGB)	firm - up to 7.2 interruptible - up to 1	firm - 0 interruptible - 8.2
Interconnection Turkey-Bulgaria (ITB)	firm - up to 6.6 interruptible - 1.6	firm - up to 6.6 interruptible - 1.6
Intrazone connection – GMS Ihtiman + GMS Lozenets (connection from ITB)	firm - 1 interruptible - 7	firm - up to 6 interruptible - 1
GMS Provadia (local production)	firm - 2 interruptible - 0.4	-
GMS Dermatsi 2 (local production)	firm - 2.2 interruptible - 1.9	-
Underground gas storage Chiren	firm - up to 5.5 interruptible - 0.5	firm - up to 5.5 interruptible - 0.5
Maximum interruptible capacity on commercial basis (backhaul)***		
Romania IP Negru voda 1		up to 20,27
Entry-exit zone - gas transmission network for transit transmission		
Romania IP Negru voda 2.3	firm - 59.25 interruptible - 1.5	-
GTNTT - exit capacity zone Bulgaria	-	firm - 0.27 interruptible - 2.4
Greece IP Kula/Sidirokastro	firm - 1* interruptible - 2*	firm - 10.27 interruptible - 1.9
Turkey IP Malkoclar	firm - 0 interruptible - 8.2	firm - 45.12 interruptible - 8.2
Macedonia IP Jidilovo	-	firm - 2.58 interruptible - 0.6
Intrazone connection – GMS Ihtiman + IP Lozenets (connection from ITB)	firm - up to 6 interruptible - 1	firm - 1 interruptible - 7
Maximum interruptible capacity on commercial basis (backhaul)***		
Greece IP Kula/Sidirokastro	up to 10,27	-

Table 1.3 - Capacities for long-term services of Bulgartransgaz EAD gas transmission networks beyond 2017.

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	Exit capacity mcm/day
Entry-exit zone - national gas transmission network		
Romania IP Negru voda 1	firm - 20.27 interruptible - 2	firm - 11 interruptible -1*

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Capacity	
	Entry capacity mcm/day	Exit capacity mcm/day
NGTN - exit capacity zone Bulgaria	-	firm - up to 14.4 interruptible - 20
Interconnection Bulgaria-Romania (IBR)	firm - up to 4.56	firm - up to 4.56
Interconnection Greece-Bulgaria (IGB)	firm - up to 7.2 interruptible - up to 1	firm - 0 interruptible - 8.2
Interconnection Turkey-Bulgaria (ITB)	firm - 6.6 interruptible - 1.6	firm - up to 6.6 interruptible - 1.6
Interconnection Bulgaria - Serbia (IBS)	firm - 4.5 interruptible - 1	firm - up to 4.5 interruptible - 1
South Stream (connection to the NGTN)	firm - up to 15	-
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	firm - 5 interruptible - 4	firm - 1 interruptible - 8
GMS Provadia (local production)	firm - 2 interruptible - 0.4	-
GMS Dermatsi 2 (local production)	firm - 2.2 interruptible - 1.9	-
Underground gas storage Chiren	firm - 10 interruptible - up to 1	firm - up to 10 interruptible - up to 1
Maximum interruptible capacity on commercial basis (backhaul)***		
Romania IP Negru voda 1	-	up to 20,27
Entry-exit zone - gas transmission network for transit transmission		
Romania GMS Negru voda 2.3	firm - 59.25 interruptible - 1.5	firm - 59.25* interruptible -1.5*
GTNTT - exit capacity zone Bulgaria	-	firm - 0.27 interruptible - 2.4
South stream (connection to the NGTN)	firm - 57 interruptible - 2	-
Greece GMS Kula/Sidirokastro	firm - 1* interruptible - 8.7*	firm - 10.27 interruptible - 1.9
Turkey IP Malkoclar	firm - 0 interruptible - 8.2	firm - 45.12 interruptible - 8.2
Macedonia GMS Jidilovo	-	firm - 2.58 interruptible - 0.6
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	firm - 1 interruptible - 8	firm - 5 interruptible - 4
Maximum interruptible capacity on commercial basis (backhaul)***		
Greece IP Kula/Sidirokastro	up to 10,27	-
Romania GMS Negru voda 2.3	-	up to 58,25

* Permanent bi-directional capacity in compliance with Regulation (EC) 994/2010

** Depending on the injection-withdrawal program. The entry capacity is for withdrawal period, and the exit - for injection

*** To the amount of the physical flow in the main direction

**** These firm capacities refer to each individual exit. Depending on the development of new transmission and storage infrastructure, the amount of firm capacities at all exit points of the NGTN cannot exceed 20.27 mcm/day.

The new interconnections capacities (ITB, IGB, IBS and IBR) listed in Tables 1.1 - 1.3, as well as the networks' connection with the South Stream are according to the design information as of April 2014 and are subject to change.

The transformation of firm capacity into interruptible and vice versa at particular entry or exit points depending on the implementation of the interconnections and the contracted long-term services for firm capacity is possible.

2. SCENARIOS FOR UTILIZATION OF CAPACITIES AT ENTRY AND EXIT POINTS FROM/TO BULGARTRANSGAZ EAD GAS TRANSMISSION NETWORKS

Two basic sample scenarios - a basic and optimistic one - for using Bulgartransgaz EAD networks, have been developed in this TYNDP.

It is necessary to consider the impact of a number of factors on network utilization, including the competition of several international projects for gas supply from countries from the Caspian region to Europe and their implementation, the natural gas prices at the different entry and exit points from/to the gas transmission networks and the gas demand levels in the country and the region, the rapidly changing technical and operational characteristics of the gas transmission systems of the interconnected countries and others.

Table 2.1 shows reference scenarios for utilization of Bulgartransgaz EAD gas transmission networks' capacities after within 2015 - 2017:

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	**Optimistic scenario, bcm/y**		**Optimistic scenario, bcm/y**	
	Entry	**Exit**	**Entry**	**Exit**
Entry-exit zone - national gas transmission network				
Romania IP Negru voda 1	3		3.2	
NGTN - exit capacity zone Bulgaria		3.6		4
Interconnection Bulgaria-Romania	0.5	0.2	0.5	0.3
Interconnection Greece-Bulgaria	0.2	-	0.25	-
Interconnection Turkey-Bulgaria	0.7	1.5	0.6	1.8
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	2.0	1.7	2.2	1.45
GMS Provadia	0.2	-	0.3	-
GMS Dermantsi 2	0.4	-	0.5	-
Underground gas storage Chiren	0.4	0.4	0.6	0.6
Entry-exit zone - gas transmission network for transit transmission				
Romania	16.8		17.55	

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Optimistic scenario, bcm/y		Optimistic scenario, bcm/y	
	Entry	Exit	Entry	Exit
IP Negru voda 2.3				
GTNTT - exit capacity zone Bulgaria		0.06		0.08
Greece - IP Kula/Sidirokastro		2.9		3
Turkey - IP Malkoclar		13.39		13.47
Macedonia - IP Jidilovo		0.15		0.25
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	1.7	2.0	1.45	2.2

Table 2.2 shows reference scenarios for utilization of the entry and exit points' capacities from/to Bulgartransgaz EAD gas transmission networks' after 2017:

Table 2.2. - scenario for capacities utilization after 2017

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Optimistic scenario, bcm/y		Optimistic scenario, bcm/y	
	Entry	Exit	Entry	Exit
Entry-exit zone - national gas transmission network				
Romania IP Negru voda 1	1.2	0.5	0.8	0.6
NGTN - exit capacity zone Bulgaria	-	4	-	4.2
Interconnection Bulgaria-Romania	0.5	0.7	0.6	0.6
Interconnection Greece-Bulgaria	1.5	-	1.8	-
Interconnection Bulgaria - Serbia	0.4	1.5	0.6	2
Interconnection Turkey-Bulgaria	1.2	0.5	1.2	0.6
South stream	1.4	-	1.5	-
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	1.5	1.4	1	0.7
GMS Provadia	0.15	-	0.2	-
GMS Dermantsi 2	0.7	-	1	-
Underground gas storage Chiren	0.65	0.6	0.7	0.7
Entry-exit zone - gas transmission network for transit transmission				
Romania IP Negru voda 2.3	-	1	-	1.2
GTNTT - exit capacity zone Bulgaria	-	0.08	-	0.1
South stream	19	-	19.75	-
Greece - IP Kula/Sidirokastro	0.6	3.2	0.7	3.4
Turkey - IP Malkoclar	-	14.7	-	15
Macedonia - IP Jidilovo	-	0.52	-	0.45
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	1.4	1.5	0.7	1

Table 2.3 shows reference scenarios for utilization of the entry and exit points' capacities from/to Bulgartransgaz EAD gas transmission networks' related to 2022:

Table 2.3. - scenario for capacities utilization related to 2023

Entry-exit points to/from Bulgartransgaz EAD gas transmission networks	Optimistic scenario, bcm/y		Optimistic scenario, bcm/y	
	Entry	Exit	Entry	Exit
Entry-exit zone - national gas transmission network				
Romania IP Negru voda 1	1.3	0.5	2.1	0.7
NGTN - exit capacity zone Bulgaria	-	4.6	-	6
Interconnection Bulgaria-Romania	0.5	0.7	0.8	1
Interconnection Greece-Bulgaria	2	-	2.3	-
Interconnection Bulgaria - Serbia	0.5	1.8	0.6	2
Interconnection Turkey-Bulgaria	1.5	0.6	1.7	0.7
South stream	1.6	-	1.6	-
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	0.9	1.2	0.3	0.3
GMS Provadia	0.1	-	0.3	-
GMS Dermantsi 2	1	-	1	-
Underground gas storage Chiren	0.7	0.7	0.8	0.8
Entry-exit zone - gas transmission network for transit transmission				
Romania GMS Negru voda 2.3		1.5		1.7
GTNTT - exit capacity zone Bulgaria		0.1		0.15
South stream	20.1		21	
Greece - IP Kula/Sidirokastro	0.7	3.6	0.8	3.7
Turkey - IP Malkoclar	-	15.2	-	15.4
Macedonia - IP Jidilovo		0.7		0.85
Intrazone connection – GMS Ihtiman + GMS Lozenets (including from ITB)	1.2	0.9	0.3	0.3

The above scenarios for capacity utilization include forecasts for use (booking) of firm, interruptible and interruptible capacity on a commercial basis.

Data in Tables 2.1 - 2.3 show that even in the basic scenario the capacities of Bulgartransgaz EAD gas transmission networks are expected to be used optimally with utilization rate by 2023 **over 95%**.

CONCLUSIONS

Bulgartransgaz EAD operates on an increasingly safer and more competitive regional and European gas market and contributes significantly for its integration. On the way to strengthening its position as independent gas transmission operator, the Company is actively involved in the development of gas infrastructure in line with the regional and Europe-wide priorities that will allow to respond to the challenges that the single European market face.

Providing and maintaining a trouble free, reliable and efficient main and ancillary infrastructure is a guarantee for the secure and high quality performance of services of natural gas transmission and storage in the country. In this regard Bulgartransgaz EAD has specific investment intentions for modernization, rehabilitation and increase of efficiency and reliability of the existing infrastructure associated with the development and progress of the gas projects in the region.

The necessity of new interconnections has been justified in the period 2014 - 2023 and new gas interconnections with Turkey, Greece, Serbia and Romania are planned to be constructed and commissioned. South Stream and other cross-border gas pipelines within the Southern Gas Corridor are planned to pass through Bulgaria which will be connected to Bulgartransgaz EAD existing gas transmission network are expected to cross Bulgaria.

Upon implementation of the Company's plans, the Bulgarian gas infrastructure will connect the common European natural gas market with the markets in the Caspian region, Central Asia, the Middle East, the Eastern Mediterranean and North Africa.

These projects will ensure natural gas supply to our country and the region by creating actual opportunities for diversification of sources and routes and will enable the supply of additional quantities of natural gas to and through Bulgaria.

The plans for expansion of the existing underground gas storage Chiren, according to the commercial interest, and the modernization and rehabilitation of Bulgartransgaz EAD network are directly related to the above described intentions for development of the gas network in the region. The implementation of all these projects is interrelated and aims at contributing to the efficiency and development of the common European gas network.

Bulgartransgaz EAD intends to focus its investment activity on the development of the gas network in the country and construction of new gas branches, thus creating the conditions for gasification acceleration in the country with the respective benefits for society - economic, social, environmental, etc. Hence, the implementation of the investments envisaged in the TYNDP will, inter alia, result in better quality of life in harmony with the 2020 Energy Strategy of Bulgaria, approved by the Council of Ministers with Decision No.133 of March 9, 2011.

The expected result of the implementation of the TYNDP is the significant increase in the quality and scope of services offered by Bulgartransgaz EAD related to natural gas transmission and storage, thus reinforcing at corporate level the successful business model of company development and providing more accessible and reliable source of energy for the society and the industry at national level.

APPENDIX 1

Key projects for new gas pipelines on the territory of the country and their connection to the existing gas transmission network

№	Project	Final Investment Decision (FID)	Deadline for completion	Contractor	Expected value of Bulgartransgaz EAD investment	Funding	Length	Change of capacity/type	Remarks
1	Interconnection Bulgaria - Romania (IBR)	yes	2014	Bulgartransgaz EAD and Transgaz S.A.	~ €13 million (€ 23,8 million -project value)	€4,3 million European Energy Program for Recovery (EEPR)/~ € 8,5 million own funding	a total of 25 km of which 15 km Bulgarian section 2,5 km Undercrossing	0,5-1,5 bcm/y permanent bi-directional (entry-exit)	At the final stage of construction.
2	Interconnection Turkey - Bulgaria (ITB)	no	2016	Bulgartransgaz EAD and Botas	~€ 50 million	own and attracted external funding	~ 75 km Bulgarian section ~ 120 km Turkish section	~3 bcm/y permanent bi-directional (entry-exit)	At the stage of Pre-investment studies aimed at determining specific realization parameters. The deadline for completion refers to the first stage of the project.
4	Interconnection Greece - Bulgaria (IGB)	no	2016	ICGB AD	~ € 5 million (€ 210 million*)	EEPR and Bulgartransgaz EAD own funding for connection to the existing network	a total of 182 km of which 151 km Bulgarian section	3 bcm/y - I stage 5 bcm/y - II stage entry (reverse during crisis situations)	The main infrastructure shall be implemented by ICGB AD. The project will be connected to Bulgartransgaz EAD gas transmission network in the area of Stara Zagora.
3	Interconnection Bulgaria - Serbia (IBS)	no	2016	Ministry of Economy and Energy	~ € 2 million (€ 48 million*)	OP Competitiveness and Bulgartransgaz EAD own funding for connection to the existing network	a total of 150 km of which 60 km Bulgarian section	1,8 - 3,1 bcm/y exit (reverse during crisis situations and disruption of the main flow)	Implemented by the MEET, beneficiary of OP Competitiveness. The project will be connected to Bulgartransgaz EAD gas transmission network.
6	South Stream (connection to the gas transmission network)	yes	2016/2017	South Stream Bulgaria AD	~ € 5 million	own funding	-	over 20 bcm/y entry	The main infrastructure in the Republic of Bulgaria shall be implemented by South Stream Bulgaria AD. The connection to Bulgartransgaz EAD gas transmission network will be at entry point in the area of CS Provadia.

Note:
* These values represent the estimated total value of the projects developed by third parties, called "third party projects"

Gas Infrastructure and Planned Gas Pipelines on the Territory of Bulgaria 2014 - 2023