

Security of Supply Statement
for Natural Gas
Georgia

Ministry of Economy and Sustainable Development of Georgia

2022

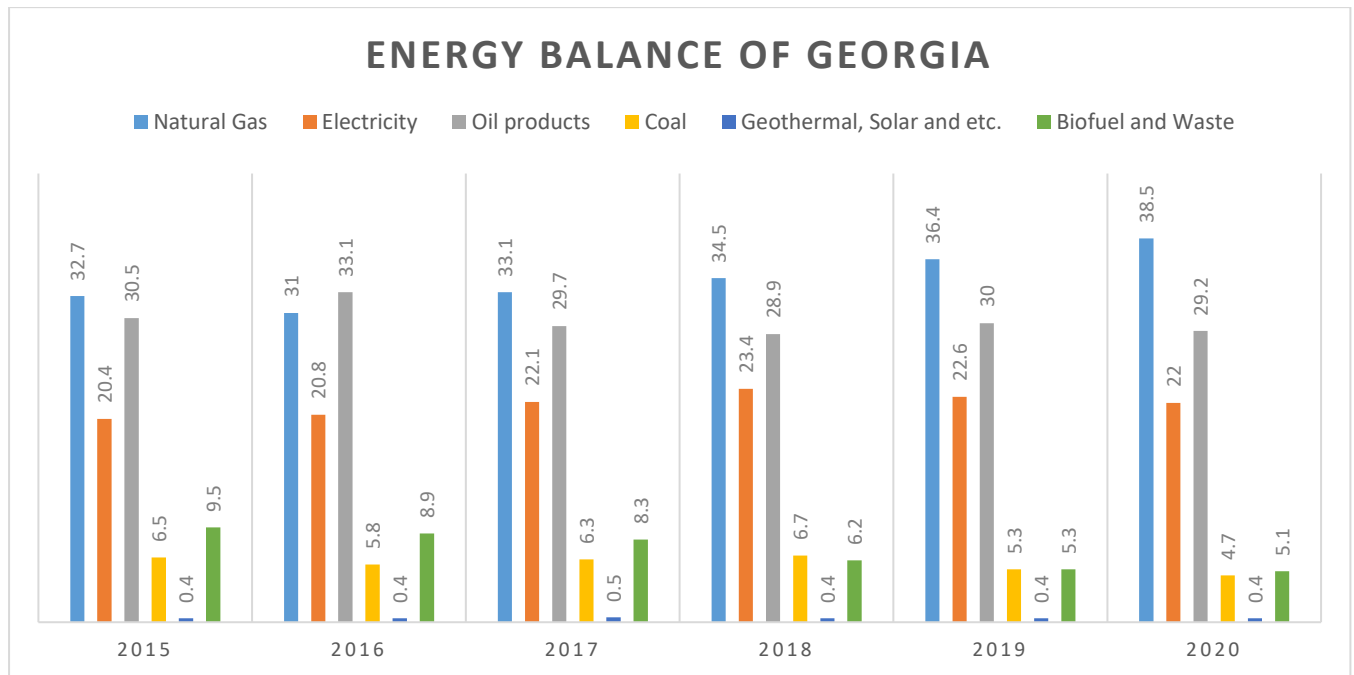
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Share of Natural Gas in the Energy Mix

The natural gas sector is one of the most dynamically developing parts of the country's economy. It should be emphasized that by the first quarter of 2022 90% of the country's territory was gasified and the government's plan envisages providing gas to all those settlements the gasification of which is expedient.

According to the Energy Balance¹ of Georgia developed by GEOSTAT, the share of natural gas in the total consumption of energy equaled to 38.5% in 2020.



In the structure of the energy consumption in 2020 38.5% accounted for natural gas. Relatively high shares are also fall on oil products (29.2 %) and electricity (22%). 5.1% of the energy consumed throughout the year comes from biofuels and waste energy, while the remaining 5.1% comes from coal and geothermal energy.

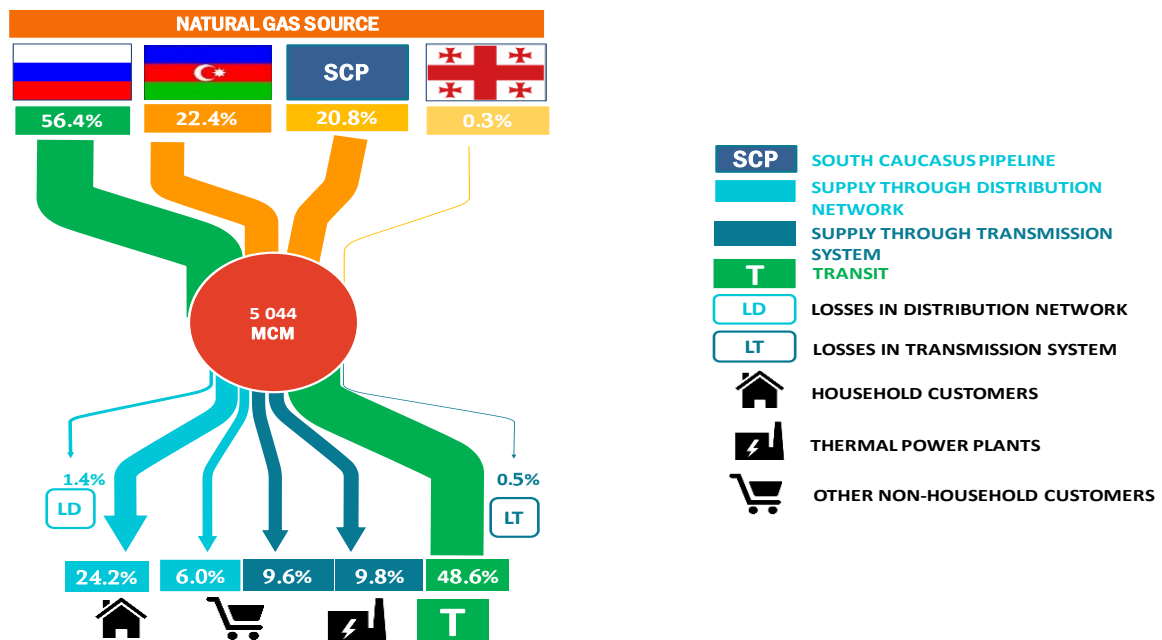
In recent years the share of biofuels and waste has been significantly reduced, one of the reasons for which may be active gasification and the replacement of solid fuels with natural gas. If the plans of the Government of Georgia on gasification for 2019-2021 and 2022-2024 are implemented, the level of households with access to the natural gas network will exceed 92% (according to the plan, in 2021-2024, more than 61 thousand additional household customers will be able to connect to the natural gas network implying a 2% increase in demand for gas, respectively). Such a level of gasification is considered a reasonable limit for a country with a similar terrain like Georgia. Thus, Georgia will have one of the highest rates of gasification in Europe.

¹ Energy Balance of Georgia 2020, source: Statistics office of Georgia

Supply Sources and Contracts

In 2021, 99.4% of Georgia's demand for natural gas was met by import and the remaining 0.6% by domestic production. In 2021, natural gas was supplied to Georgia from 4 sources. The main source remains the Republic of Azerbaijan 2182.7 mcm (from SOCAR-1132 mcm; from Russia- 396.8 mcm; from South Caucasian gas pipeline (hereinafter-SCP) - supplemental and optional gas - 1050.7 mcm, from local extraction-15.2 mcm)².

The figure below illustrates supply of and demand on Natural Gas in Georgia³ and directions of natural gas flows in 2021.



The figures with respect to supply in 2021 are provided below, covering the period of January-December and for comparison purposes data of equivalent period in 2019 and 2020 are also given⁴:

	2019, January –December, mcm	2020, January –December, mcm	2021, January - December
Total gas entered the system	4758.693	4781.33	5043.990
Transit to Armenia	2166.916	2208.602	2449.230
Gas Volumes for Georgia			

² Source: "GGTC"

³ Source: GNERC

⁴ Source: "GGTC", Comercial Department

From Russia	162.378	204.039	396.813
From Shah-deniz	1191.029	1157.785	1050.720
From SOCAR	1229.356	1183.38	1132.013
Local Production	9.014	8.259	15.213
Other source		19.265	
Total	2591.777	2572.728	2594.76

The gas supply from the Shah Deniz field of Azerbaijan to Georgia is provided through the South Caucasus Pipeline (SCP). In accordance with the agreements between the parties of the South Caucasus Pipeline project and the Government of Georgia, Georgia as an owner of the territory has a right to purchase:

- Optional gas purchase and sale contract (Optional Gas Contract) with South Caucasus Pipeline Option Gas Company, according to which JSC Georgian Oil and Gas Corporation (hereinafter: GOGC) is granted an option to purchase up to 5% of the transit volume carried through SCP during the previous year in each contract year amount of natural gas (hereinafter: "optional gas"). Option Gas Contract is valid until 2068.
- Supplemental gas purchase and sale contract (Supplemental Gas Contract) with Azerbaijan Gas Supply Company, within the framework of which GOGC has the right to purchase 500 mln. cubic meter of natural gas (hereinafter: Supplemental Gas). The Supplemental Contract is valid until 2026.

As a result of the recent extension of the SCP and completion of TANAP and TAP Georgia will benefit in two ways:

- Increasing political importance - the country's role for the energy security of both the region and Europe has increased dramatically, which leads to the strengthening of its geopolitical importance. Through the southern gas corridor, which currently consists of SCP, TANAP and TAP gas pipelines, natural gas can be supplied to Turkey and 8 European countries. And after the implementation of the Greece-Bulgaria interconnector (the start of commercial operations is planned for July 2022) and other projects, Azerbaijani gas may become available to 5 additional countries of South-Eastern Europe, for which Russia is practically the only source of natural gas imports;
- Economic benefits - before the expansion of SCP⁵, the country was receiving up to 330 mcm of natural gas per year and in a few years this volume will reach 1.1 bcm. However, this will be the case if the infrastructure on which the contracts are signed are fully loaded. Turkey receives 6 bcm/y and will

⁵ Source: Before the expansion of SCP, its capacity was 8-9 billion m3/year. After the expansion, 16 billion m3 was added and its maximum capacity reaches 24-25 billion m3/year in total (source BP External Communication and Campaign Management Department) "The pipeline has the capacity to pump gas up to 20 billion cubic meters a year". – source: <https://socar.az/socar/en/activities/transportation/baku-tbilisi-erzurum-gas-pipeline>
 SCPX will expand the existing 7 bcma SCP system to accommodate a further 16 bcma - source https://www.bp.com/en_ge/georgia/home/who-we-are/scp.html
 In 2021, SCP's daily average export volume was 48.5 million kb/m of gas per day, i.e. 17.7 billion m3 of Azerbaijani gas was transported through the Georgian corridor during the year.

receive an additional 6 bcm. Also, Europe will receive 10 billion cubic meters, including supply to Italy in 2022 within the framework of long-term contracts will reach 9.5 bcm (in 2021, the supply of Azerbaijani gas through Georgia amounted to 7 billion m³ only to Italy⁶). It should be mentioned that Azerbaijani gas supplied to Turkey or Europe, is cheaper than Russian, Iranian, Algerian or Norwegian gas.

In order to guarantee the demand of household and thermal generation facilities (hereinafter collectively referred as: "social gas sector"), natural gas is supplied to the country within the framework of a memorandum signed between the Government of Georgia and the Azerbaijani SOCAR. Accordingly the relevant gas purchase and sale contract was signed with SOCAR⁷, which is an additional (along with optional gas and supplemental gas) source of natural gas intended to meet the needs of the "social gas sector". The terms of gas supply to the Georgian market are agreed, however, the certain terms of the contract were updated in 2021 and the contract expires in December 2030. In this respect, gas flows through Kazakhi-Saguramo Interconnector.

In addition, gas is supplied at market prices to meet the demand of Georgia's industry and commercial sector, mainly from Azerbaijan (by the LLC Socar Georgia Gas) and also from Russia (by GOGC, which supplies Russian gas at a preferential price to LLC Georgian Gas Transportation Company (hereinafter: GGTC) and other enterprises determined by the Government of Georgia.

As for the import from Russia, Georgia can receive Russian gas from North-South Caucasus main gas pipeline. In 2021, 396.8 million m³ of gas was supplied to Georgia from this source at market prices, which was related to the interruption of gas supply from Azerbaijan.

In this regard, it should be noted that the experience of recent years, and especially the events in the winter periods of 2020 and 2021, show that the Georgian subsidiaries of SOCAR are facing significant problems in the matter of importing natural gas from Azerbaijan to Georgia. The specified circumstance becomes especially clear during the peak consumption of natural gas during the winter period, when GOGC has to avoid and/or eliminate the shortage of natural gas supply with its own resources (at the expense of increasing natural gas imports from the Russian Federation). It is worth to mention that in order to eliminate the shortage of Azerbaijani gas supply in 2021, the GOGC substantially exceeded the annual contract volume (up to 200 million cubic meters of gas) provided for in 2021 by the agreement signed with GAZPROM Schweiz AG on May 20, 2020. In the period from January 1 to June 1, 2021, the GOGC purchased up to 303 million cubic meters of gas from GAZPROM Schweiz AG, and for the rest of 2021, it had to sign an additional contract for the purchase and sale of natural gas with Gazprom Export LLC (contract volume - 90 mcm). In addition to the volumes of Russian gas purchased by SOCAR Georgia Gas LLC from GOGC to meet the needs of the commercial sector, in 2021 GOGC had to purchase approximately 26 million cubic meters of Russian natural gas to meet the needs of the "social gas sector", which was the responsibility of SOCAR Export-Import LLC.

⁶ Source: <https://energynews.ge/?p=39642>

⁷ Later, it was replaced by the Georgian subsidiary of "SOCAR" - "SOCAR Georgia Gas" LLC.

Generally, The North South Caucasus main gas pipeline mainly serves natural gas transit from Russia to Armenia. The gas pipeline operator - Georgian Gas Transportation Company Ltd (GGTC) receives monetary compensation for the services rendered.

Household consumers belonging to the so called “Social Sector” are supplied at a tariff regulated by the GNERC, and the thermal power plants - at preferential rate established by the memorandum of understanding between the Government of Georgia and SOCAR and under the relevant contracts. Retail and wholesale prices for the rest of the customers are deregulated and gas is supplied at publicly offered prices and conditions. Prices are confidential at the wholesale level.

Natural Gas Production

The analysis of historic data of natural gas (free and associated) shows that peak production (332 mcm) was recorded in parallel with the intensive oil production period, however later the decreasing trend of oil production resulted in significant decline of associated gas production.

In the table below gas production data of recent years are given⁸:

<i>Time Period</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
Gas extraction/production, m ³	16 703 000	10 882 000	10 847 000	12 997 000	12 914 000	10 973 624	18 656 743

Notably one of the most prominent recent developments is the entrance of the OMV Petrom into the Black Sea shelf. In June 2020, the Government of Georgia conducted a relevant tender and on March 10, 2021, a production sharing agreement was signed for license block II with the tender winning Romanian oil company OMV PETROM S.A., which belongs to the OMV Group. The contract signed with the Romanian company involves the extraction, acquisition, processing and re-interpretation of geological and geophysical data on the Black Sea continental shelf (area 5282 km²) for a period of 25 years for the purpose of oil and gas extraction. The budget for the Georgian project is 30 million US dollars⁹.

According to the contractual obligation, OMV Petrom S.A. prepared an environmental impact assessment report, which was approved by the LEPL State Agency of Oil and Gas. At this stage the implementation of the intensive seismic exploration works is started, namely two-dimensional and three-dimensional seismic exploration works¹⁰. It should be noted that OMV Petrom discovered the Domino deposit in the Black Sea, in the territorial waters of Romania. According to the information of the agency, when the field processing in the territorial waters of Georgia reaches its peak, the picture of gas supply and consumption in the region may change. According to preliminary data, the potential structures in Georgia where gas can be accumulated are in no way inferior to the discovery of Domino. In this way, it can be said that Georgia will not only meet its own needs, but it may export as well¹¹.

⁸ Source: State Agency of Oil and Gas (April, 2022)

⁹ <https://energynews.ge/?p=39638>

¹⁰ Source: State Agency of Oil and Gas (April, 2022)

¹¹ <https://energynews.ge/?p=39638>

Furthermore, the agency has announced an open international tender for license block III of the Black Sea, and interested companies can submit applications until the end of this year. In case of successful completion of the tender, large-scale geophysical exploration works will be carried out on 3468 km².¹²

Gas Consumption Trends and Forecasts

Today, the natural gas sector continues to operate normally, without significant disruptions, although in 2020, due to the COVID-19 some restrictions have been put in place to protect the health of the system's operating staff and management.

So far, gas consumption is repeating the same trend and does not differ significantly from the seasonal variability typical for the same period of previous years. The issue is relatively different with regard to generation and commercial sectors where the decrease is observed due to the pandemic though it is compensated by the increase in the consumption share of the residential sector. In addition, it should be mentioned that the trend of increasing gas consumption in the household sector (by 14% annually) to a certain extent is a direct result of a large-scale gasification program and establishment of preferential tariffs, as well as significantly increases the subsidy to be provided by GOGC in order to maintain the final consumer tariffs in the social gas sector.

Generally, total consumption in 2020 does not differ much from 2019. As for 2021, there was a decrease in electricity generation sector.

Below is the data provided by the Commercial Department of GGTC:

<i>Consumption of natural gas in Georgia (mc)</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
Generation of electricity	677.867	614.266	495.6
Residential sector	978.919	1123.562	1291.4
Commercial sector	902.823	811.002	777.1
Total	2559.609	2548.830	2564.2

¹² Source: State Agency of Oil and Gas

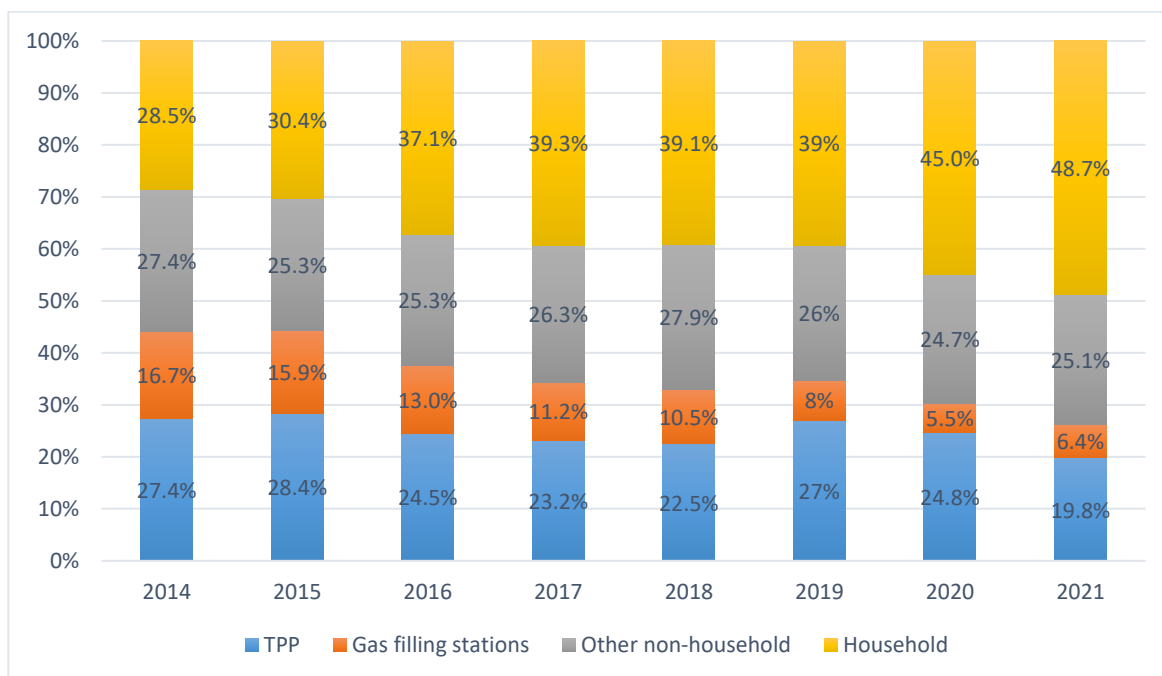


Figure - Natural Gas Consumption by different sectors (%) in 2021¹³

Seasonality is an important characteristic of the natural gas market in Georgia and affects current market arrangement. Demand in Georgia is highly seasonal due to: i) demand from households and commercial consumers (offices, public building, hospitals, universities and etc.) for heating in winter period; ii) demand from TPPs.

Seasonal variation in consumption is an important feature of the natural gas market in Georgia. The increased demand in the household sector is explained by the gasification of new settlements and the increase in the capacity of the devices used by consumers (mainly switching to central heating boilers). As for the decline in demand for gas from filling stations after 2015, when natural gas consumption in road transport reached its peak, consumption in this sector is constantly declining. Among the reasons for this are the rise in prices for natural gas, the increase in taxes on this type of fuel, the prices of competing fuels (increased competition from liquefied natural gas (LHG) should be taken into account), an increase in the import of hybrid and electric vehicles, which mainly replace cars, running on natural gas.¹⁴

Analysis of statistical data shows that during the period of independence, except for the 2008 military conflict with Russia and the period of economic recovery following the global financial crisis of 2009-2010, gas supply and consumption in Georgia was characterized by an increasing trend.

According to previous forecasts, the upward trend of gas consumption should be maintained for the next 10-15 years. Due to the spread of the COVID-19 infection, consumption decreased slightly in 2020 however the figure for 2021 reached the level of 2019 again.

¹³ Source: GNERC

¹⁴ GNERC report for 2020

The variability of natural gas consumption depends on many parameters and its accurate forecasting is a difficult task. Below, the forecast prepared by GGTC is presented. The forecast is based on the statistical (Top-Down) method, in particular, the multi-parameter linear regression method. The independent parameters are the percentage variation of GDP and the annual average heating degree day¹⁵ compared to the previous year, and the dependent parameter is the percentage variation of gas consumption compared to the previous year. To build the model, data from previous years (2007-2021) were taken and the dependence of consumption variability in these years on independent parameters (according to the least squares method) was studied.

Initial data:

Year	Heating Degree Day $\Delta\%$	GDP $\Delta\%$	Gas Consumption $\Delta\%$	Gas Consumption 1 000 000 cm
2007	4.8	12.6	-5.9	1 700
2008	3.8	2.4	-13.5	1 471
2009	-18.4	-3.7	-19.2	1 188
2010	-3.0	6.2	-5.7	1 120
2011	28.6	7.4	59.0	1 782
2012	-13.6	6.4	10.5	1 969
2013	-5.3	3.6	-2.9	1 911
2014	1.1	4.4	13.8	2 175
2015	0.2	3.0	9.6	2 384
2016	3.0	2.9	-6.2	2 236
2017	-2.8	4.8	3.2	2 308
2018	-12.3	4.9	-2.1	2 259
2019	3.3	5.1	13.3	2 560
2020	6.2	-6.8	-0.4	2 550
2021	5.0	10.4	0.6	2 565

¹⁵ It shows the difference between the outside temperature and the base temperature. The base temperature represents the balance point, i.e. the minimum temperature of the environment, under which there is no need to heat the building. If the daytime temperature is lower than the baseline, heating is required on such a day, and the difference between the temperatures is the degree day of that day.

Results of regression analysis:

<i>Regression Statistics</i>	
Multiple R	0.90639357
R Square	0.821549305
Adjusted R Square	0.750169026
Standard Error	8.997201488
Observations	15

Consumption forecast:

<i>Year</i>	<i>Heating Degree Day</i> $\Delta\%$	<i>GDP</i> $\Delta\%$	<i>Gas Consumption</i> $\Delta\%$	<i>Gas Consumption</i> 1 000 000 cm
2022	4.8	6.0	3.5	2 654
2023	5.3	5.5	2.4	2 719
2024	5.0	5.2	2.1	2 775
2025	5.1	5.2	2.5	2 846
2026	5.1	5.2	2.3	2 911

The average value of the corresponding value of the previous three years is taken as the value of the heating degree day change of the next year. The forecast of changes in the GDP is taken from the report of the Ministry of Finance of Georgia¹⁶.

Despite the fairly high reliability of the model (determination coefficient $R^2 \approx 0.82$), the accuracy of the forecast mostly depends on the load intensity of large consumers, especially thermal power generation facilities and on climatic conditions in the following years.

It should also be noted that within the framework of the project for the preparation of the Ten Year Plan for the Development of the Natural Gas Transmission Network GGTC in cooperation with GOGC performed a forecast of natural gas consumption in 2020 based on the bottom-up methodology, as a result of which thermal generation facilities, large consumers (with a consumption of 5 million m³ per year) and distribution companies were surveyed. The received results were distributed as follows (although the figures provided most likely did not take into account the impact of the COVID-19 infection):

<i>Consumers</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>	<i>2024</i>	<i>2025</i>	<i>2026</i>	<i>2027</i>	<i>2028</i>	<i>2029</i>	<i>2030</i>
Household	988.00	1001.43	1035.03	1061.80	1085.70	1110.07	1134.44	1157.04	1178.90	1396.00
Commercial	799.20	833.00	873.75	912.50	951.38	990.78	1032.00	1073.94	1119.0	1165.00
TTPs	1118.40	1036.50	1038.40	1044.00	1042.50	1044.40	1046.50	1052.00	1050.40	1052.40
Total	2905.60	2870.94	2947.15	3018.30	3079.58	3145.25	3212.97	3282.98	3348.30	3615.32

¹⁶https://mof.ge/images/File/2022-biujeti/21-12-2021/DanarTebi/12.%202022%20BD%20Tables%20sen%2011_1_BDD_LEPL.pdf

The Structure and Reforms of the Natural Gas Sector of Georgia

The structure of the natural gas sector of Georgia is comprised of Gas Suppliers (producers, importers, traders and retail suppliers), Transportation Licensee, Distribution Licensees, Direct Consumers (including TTPs) and Retail Consumers.

Sector policy is determined by the Ministry of Economy and Sustainable Development (MoESD), while the core regulation function is carried out by the Georgian National Energy and Water Regulatory Commission (GNERC). The regulation tools of GNERC are, inter alia, licensing of energy activities, setting tariffs, resolution of disputes, customer protection, market monitoring and so on.

However, the regulation of activities related to gas extraction, processing and transportation of extracted gas through upstream pipelines is carried out by the LEPL State Agency of Oil and Gas (SAOG) within the system of the MoESD. SAOG issues licenses for the relevant activities.

State-owned JSC Georgian Oil and Gas Corporation (GOGC), as well as LLC Georgian Gas Transportation Company (GGTC) play significant roles in the gas sector.

GOGC is the sole founding partner of the owner of the main gas pipeline system of the country - LLC Owner of the Natural Gas Transmission Network of Georgia. GOGC acquires volumes of the Optional Gas, Supplemental Gas and SOCAR Gas and delivers them to SOCAR Gas Export-Import LLC, which is responsible for meeting the needs of the "social gas sector". On the instructions of the Government of Georgia, GOGC will allocate significant funds (subsidies) to maintain the stability of the natural gas prices set for the consumers of the "social gas sector" and, among them, the end-consumer tariffs set for the population. In addition, GOGC supplies natural gas received from Russia as well as small volumes of locally produced gas to the commercial segment of the market, and in case of emergency situations in terms of gas supply, it ensures the elimination of shortages.

GGTC is a transportation licensee and it carries out maintenance and operation of main pipelines as well as transit of the Russian gas to Armenia. GGTC ensures transportation of gas from suppliers to the distribution network and to consumers connected to natural gas transmission network (so called "direct customers" including thermal generation facilities). Mainly, gas import and supply (to distribution companies and large direct consumers) to the local market, both for the regulated segment and commercial consumers, is carried out by State Oil Company of Azerbaijan – SOCAR through its subsidiary SOCAR Georgia Gas, and the regulated segment is covered through the SOCAR Gas Export-Import¹⁷. Socar affiliated companies take the major share in distribution activity outside the Capital while the distribution company Tbilisi Energy Ltd covers the most parts of Tbilisi.

Georgia signed the "Association Agreement" with the European Union in 2014, according to which the terms and conditions for the implementation of most of the EU directives/regulations in the field of energy were to be determined within the framework of the organization's membership in the "Energy

¹⁷ For the regulated segment (population and thermal plants), the gas flows supplied by "SOCAR Georgia Gas" and the Shahdeniz consortium are accumulated by "GOGC", after which the corresponding volumes of gas are supplied to "SOCAR Gas Export-Import", which in turn supplies the thermal plants and retail suppliers.

Community"¹⁸. Georgia joined the "Energy Community" in 2017. In order to fulfill the obligations of the Energy Community which is to bring Georgian legislation in line with European legislation, the Law of Georgia on Energy and Water Supply was adopted at the end of 2019 which creates a legal framework for developing a competitive energy market, ensures the improvement of transparency, competition and investment environment as well as defines the main functions, rights and responsibilities of the natural gas transmission system owner, transmission system operator and other natural gas market participants, strengthening the energy regulator as well as ensuring energy security by transposing directives:

- EU Directive N 2009/72/EC on common rules for the internal market of electric power
- EU Directive N 714/2009 (EC) on conditions for access to the network for cross-border exchanges in electricity and repealing
- EU Directive N2005/89/EC on supplying electric energy and measures of ensuring security of investments in infrastructure;
- EU Directive N2009/73/EC on imposing common laws for the internal market of natural gas
- EU Directive (EC) N715/2009 on the conditions of admitting to the natural gas transmission lines
- EU Directive N2004/67/EC on the measures of ensuring security of supplying natural gas;

Accordingly, the aforementioned law creates the basis for the development of a competitive energy market, ensures the improvement of transparency, competition and investment environment, and also defines the main functions, rights and duties of the owner of the natural gas transmission network, the operator of the transmission system and other participants of the natural gas market. In addition, the law includes important provisions aimed at strengthening the regulatory body in the field of energy and ensuring energy security.

According to the law, the competent authorities must develop and approve new by-laws and make changes to the existing legislation in order to fully implement the above-mentioned goals within the terms established by this law. In this regard, it should be mentioned that in accordance with the requirements of the Law of Georgia on Energy and Water Supply, plan of unbundling of the operator of the natural gas transmission system was prepared, which was approved by the Resolution No. 129 of the Government of Georgia dated March 26, 2021, and in 2021, the activities envisaged by the plan were implemented. Since the unbundling and certification process of the natural gas transmission system operator has not been completed, the work in this regard will continue in 2022. GGTC application for unbundling has been submitted to GNERC.

In addition, on February 11, 2021, the order N1-1/37 of the Minister of Economy and Sustainable Development of Georgia on the exemption from the obligation of unbundling of operators serving less than 100 thousand customers was approved.

Also, on September 2, 2021, according to the Resolution N447 of the Government of Georgia, the Concept of the Natural Gas Market Model was approved. The Concept aims to establish a free natural gas market,

¹⁸ "Energy Community" is an organization whose main goal is to spread European energy legislation and market principles in non-EU countries.

where participants will benefit from equal, non-discriminatory conditions and a transparently established competitive price, which will give consumers the opportunity to make a free choice. Nevertheless, the target model does not exclude the determination, imposition and implementation of public service obligations for a limited period based on the common economic interest.

In addition, the European Bank for Reconstruction and Development (EBRD), the Secretariat of the Energy Community, GOGC, GGTC and the Ministry have been working on a project of a memorandum regarding the development of the gas exchange and OTC auction platform for bilateral agreements. The mentioned memorandum was signed in July 2021, and the first working meeting between the parties was held in October.

In accordance with the concept of the Natural Gas Market Model, on October 15, 2021, Georgian Gas Exchange LLC (hereinafter GGEX) was established, which, according to the plan, will obtain a natural gas market operating license from GNERC in 2022. In addition, within the framework of the aforementioned memorandum, with the financial support of the EBRD, an international consultant has prepared a draft of the Rules of the Natural Gas Market in cooperation with the parties.

In November 2021, at the suggestion of the Energy Community Secretariat, Georgian Gas Exchange LLC and Georgian Gas Transportation Company LLC joined the Memorandum of Understanding, signed on July 2, 2021, on trans-regional cooperation between the Energy Community Secretariat, Gas Exchanges of European countries and Gas Transmission System Operators, which aims to develop the Eastern and Southeastern European Integrated Gas Market (SEEGAS). As a result of cooperation in the mentioned format, Georgian companies hope to successfully cooperate with advanced European gas exchanges and transmission system operating companies and acquire the necessary knowledge.

In order to regulate relations in the natural gas retail market, GNERC approved the Rules of the Natural Gas Retail Market by Resolution No. 60 of December 28, 2021, which reflects the best European practices in the regulation of relations between natural gas suppliers and consumers.

In addition, during 2021, with the involvement of the Georgian side, the Energy Community Secretariat prepared the project of Rules on the Security of Natural Gas Supply within the framework of the EU4Energy program in accordance with the requirements of the Law of Georgia on Energy and Water Supply. The mentioned project takes into account the requirements of Regulation 1938/2017 regarding measures to ensure the security of gas supply to the European Union and will be approved in 2022.

It is also important to note, that Georgia reflected in the legislation the requirements of the European Commission Regulation N312/2014 on the approval of Network Rules regarding gas balancing in transmission networks, which was one of the obligations within the Energy Community. For this purpose, on September 9, 2020, the GNERC approved Resolution No. 48 on amending Resolution No. 22 of August 31, 2018 of the GNERC on Approving the Rules of the Natural Gas Network, thereby adopting natural gas balancing Network Rules.

Additionally, according to the Resolution No. 7 of the GNERC of March 30, 2021, the rules for monitoring and reporting of the energy market were approved. The requirements and principles of the Regulation of the European Parliament and the EU Council No. 1227/2011 (EC) On the integrity and transparency of the

wholesale energy market approved in an adapted form by the decision of the Council of Ministers of the Energy Community No. D/2018/10/MC-EnC have been reflected in the legislation of Georgia.

In August 2021, Georgia submitted the Natural Gas Security of Supply Statement to the Energy Community Secretariat, which was required by the founding treaty of the Energy Community.

At this stage, the natural gas market covers natural gas retail and wholesale markets but an organized market of natural gas does not exist in Georgia. Due to this fact purchase and selling of natural gas on the wholesale market are carried out through bilateral agreements. Suppliers import natural gas (or purchase small volumes of extracted natural gas) and resell it to the other suppliers and/or direct customers. However, at the retail level, suppliers directly supply natural gas to the final customers. The abovementioned does not exclude the operation of one supplier at both market levels.

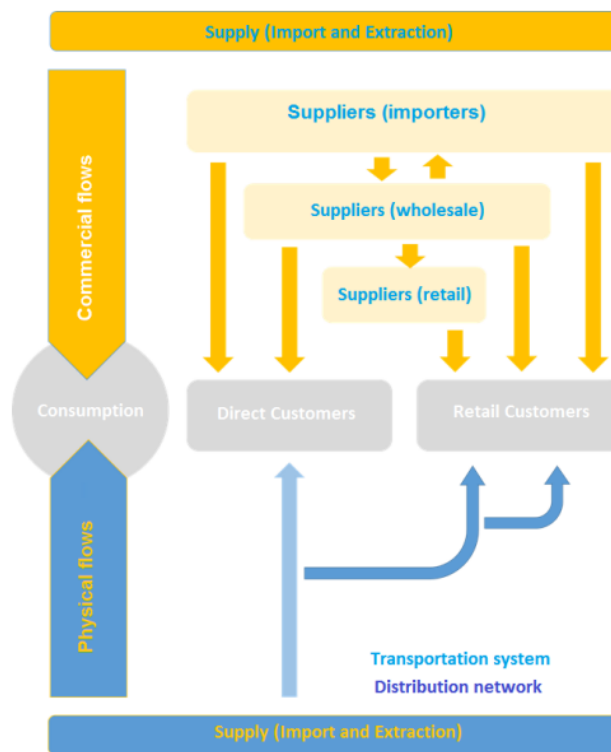


Figure - Natural Gas market structure in Georgia¹⁹

The SOCAR affiliated companies are still holding dominated positions and participating in the wholesale and retail markets. The natural gas market of Georgia is highly concentrated at both levels. Market concentration indices in Georgia significantly exceed the competitive market parameters in the international practice, in particular, the respective indices of the gas market target model recommended by the Agency for the Cooperation of Energy Regulators (ACER) and the EU (see the Table below) or the criteria established by the US Department of Justice (see table 1)²⁰.

¹⁹ Source: GNERC report for 2020

²⁰ Teimuraz Gochitashvili, Oil and Gas sector of Georgia in the Transition Period, 2020

	HHI	No of Suppliers	MCR
Threshold by ACER Gas Market Model	≤ 2000	≥ 3	$\leq 40\%$
Actual Geo	≈ 5000	3	$\approx 90\%$
Actual EU	≈ 1700	$\gg 3$	$< 40\%$

Table - Target indices of the market concentration

According to GNERC's 2021 report, eleven suppliers traded wholesale natural gas available on the Georgian market, among which the share of three largest suppliers was 94%, and the Herfindahl-Hirschman Index (HHI) was 3109, which also indicates a highly concentrated market. In conditions, where the market is characterized by high concentration at the level of natural gas import, development of competition in wholesale trade is impossible without imposing special measures.

Thus, securing the transparent and competitive business environment is among the most important challenges that Georgia is currently facing on its road towards market liberalization. At this level of trading (injection of natural gas in the wholesale market) Herfindahl-Hirschman index (HHI) between suppliers constituted 5,200 that indicates a highly concentrated market. Such situation is particularly typical for the countries which are not sufficiently connected to the neighboring countries and/or the importers not interested in utilizing different sources (See table below for detailed information).

Natural Gas Source		2016	2017	2018	2019
Azerbaijan	SCP Contracts	792	821	822	853
	Other Contracts	1321	1380	1 401	1568
Russia		122	135	39	162
Armenia		19	0	15	0
Local Production		6	8	9	9
Total		2 261	2 344	2 286	2 592

Table - Natural gas delivery to Georgia by entry points (MCM)

Searching for alternative sources of natural gas is important in the long-term perspective (including access to liquefied natural gas and the Turkish market and importing in the Georgian market through so-called swaps²¹), which can be implemented in case of relevant amendments to the legislation and interests of suppliers. In addition, it is very important to promote local production, including biogas and support integration in the network. Thus, Georgia's main goal is to diversify the energy sources to ensure the sufficient level of competition and accordingly energy security in the country.

²¹ The relevant projects were submitted by GOGC to the Energy Community Secretariat and received PMI status

Natural Gas System of Georgia and Development Plan

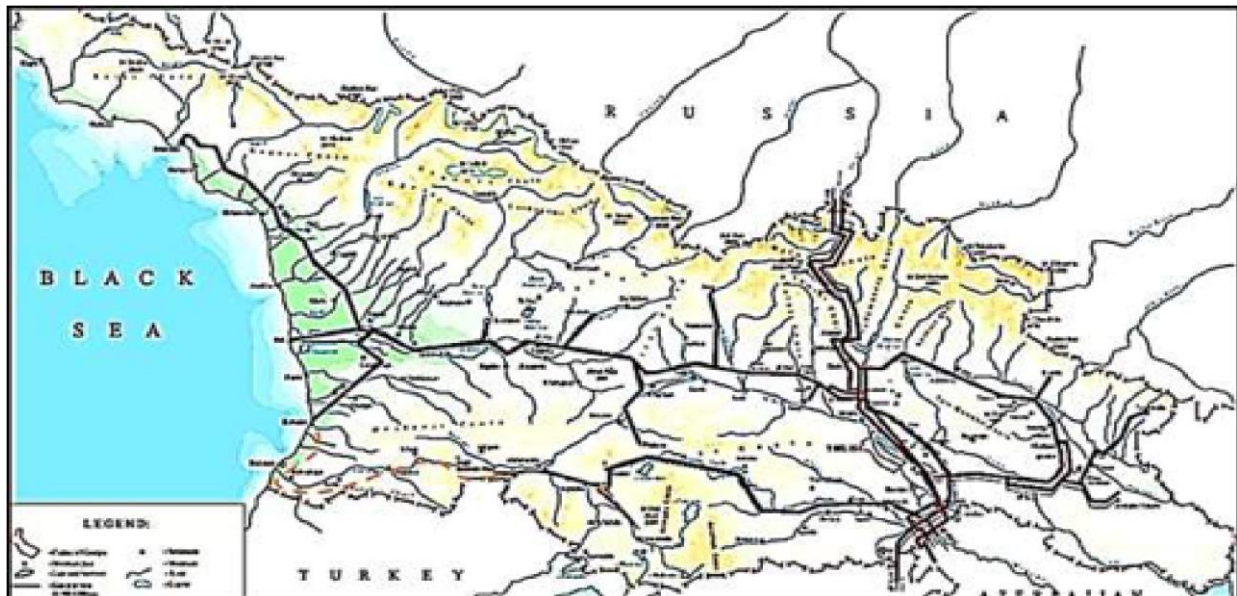
Natural gas system of Georgia has a unique geographical location, which creates opportunities for transportation of energy resources in different directions and it already has the infrastructure characteristic for the transit corridor in the gas sector, namely:

- Gas from the Shah Deniz field in Azerbaijan is supplied to Turkey via the South Caucasian Pipeline (SCP), from where gas is also supplied to Europe. The actual load of the SCP gas pipeline in 2015-2017 was about 6 bcm/year, in 2018 - 7 bcm/year, in 2019 it exceeded 9 bcm/year, in 2020 it was 11 bcm/year, 17.7 bcm in 2021. According to the plan, the amount of gas transported will reach 22-24 bcm/year by 2025-2030.
- The transit of Russian gas in the direction of Armenia is carried out through the North-South Main Gas Pipeline System (NSGP). The load on the NSGP pipeline is significantly reduced compared to its design capacity. In 2017-2021, the transit of Russian gas through the gas pipeline in the direction of Armenia has increased from 2 bcm/year to 2.5 bcm/year.

Georgia's domestic market is supplied by means of the East-West and North-South main gas pipeline system through Kakheti, Southern, Adjara and Poti branches. The pipeline system is connected to the North-South Caucasus main gas pipeline from Russia to the Georgian-Russian border, the South Caucasus pipeline and the gas pipeline from Azerbaijan near the Georgian-Azerbaijani border and the Armenian branch at the Georgian-Armenian border.

The center of the main pipelines is the Saguramo gas distribution unit, where natural gas imported from Russia and Azerbaijan is accumulated and distributed throughout Georgia.

The unified gas supply system also includes approximately 20 thousand km of distribution pipelines, hundreds of gas distribution stations and gas metering stations, and two currently inactive compressor stations.



The total length of the main gas pipelines of Georgia is about 2000 km. Their construction began in 1959 and was carried out with special intensity in the 70s and 80s of the last century. In the initial period of the country's independence, under the conditions of the collapse of the centralized economy of the former Soviet Union, the pace of infrastructure construction also dropped sharply.

The construction and rehabilitation of the main gas pipeline has resumed since 2007 (initially with the financial assistance from foreign donors, the US MCC and USAID). Ongoing gas pipeline construction-rehabilitation and development works target mainly at increasing the system capacity and operational flexibility and reliability by using new, high-throughput capacity sections and interconnectors.

The diameter of the main gas pipelines varies from 300 to 1220 mm, with a design pressure in the range of 25-56 bar.

The low throughput of the physically obsolete part of the infrastructure, inadequate technical reliability and their incompatibility with modern requirements of planning, construction and operation are among the most important challenges for the country's energy security. The table below shows the age, length and percentage of pipelines within the natural gas transmission system²²:

<i>Pipeline age, Year</i>	<i>Length, km</i>	<i>%</i>
> 40	546,106	28.5%
> 20-40 ≤	829,46	43.4%
>10-20 ≤	200,904	10.5%
≤10	336,58	17.6%
Total	1913,05	100%

It is noteworthy that as a result of construction and rehabilitation works carried out in the last decade, several regions of the country are provided with ring gas supply systems. In particular:

- The Kakheti region can be supplied with gas from the south (Azerbaijani gas along the Rustavi-Sagarejo section) or from the north (Russian gas through the Zhinvali-Akhmeta section).
- Gas can be supplied to the regions of southern Georgia, Adjara and Guria from the south-east (Azerbaijani gas via the Red Bridge-Marneuli section or from the west via the Senaki-Kobuleti main pipeline and then from the Adjara border to Goderdzi).

Besides capital repairs and construction works carried out by GOGC, the regular maintenance works are performed by the GGTC as regulated under the lease agreement signed between them.

According to the latest edition of the ten-year plan for the development of the natural gas transmission network (November 2020), the following criteria are used to determine the priority of realization of infrastructure projects in terms of time for conditional ranking:

1. Damaged and out-of-order infrastructure that requires immediate restoration or infrastructure whose further operation is a risk due to inadequate technical reliability;

²² 10 year gas infrastructure development plan prepared by GOGC

2. Insufficient capacity infrastructure that cannot provide guaranteed gas supply during forecasted peak loads or infrastructure with insufficient flexibility (operational recovery after failure);
3. The degree of potential impact of the infrastructure intended for new or restoration-reconstruction on ensuring the country's energy security and economic growth;
4. The degree of potential impact of the planned infrastructure on the provision of international energy security and on the natural and social environment.

Due to the COVID-19 pandemic some activities were suspended including important energy projects, in order to use the funding intended for them to cover vital health care costs. For example, commencement of the Aspindza-Kotelia and Khashuri-Zestafoni pass section projects, planned in 2021-2022 according to the current Ten Years Network Development Plan, has been suspended for an indefinite period. Also, the construction projects of the underground gas storage, gas combined cycle thermal power station and, accordingly, the pipelines connecting the gas pipeline with the South Caucasian pipeline-Transport Tese have been suspended.

Investment infrastructure projects to be implemented as a priority in the short term include the completion of the Kobuleti branch project under construction and the completion of the East-West main gas pipeline with 700 mm diameter pipes, which will ensure guaranteed gas supply to the population, commercial sector and industry of the western and central regions of the country, including developing industrial zones and the Black Sea recreational zone²³.

In the plan of unbundling of Natural Gas TSO approved by the Resolution No. 129 of the GoG on March 26, 2021, the approximate deadlines for the completion of the infrastructure projects implemented by GOGC and/or LLC Owner of the Natural Gas Transmission Network of Georgia are:

- Kobuleti branch - 2023 (postponed for one year);
- Natakhtari-Tsiliani-Ksani - 2022 (remained unchanged);
- Air crossing over Aragvi in Saguramo - 2023 (postponed by one year);
- Khashuri-Zestafoni - 2025 (postponed for two years);
- Aspindza-Kotelia - 2025 (postponed for two years);
- Lekhura-Sveneti - 2024 (postponed for one year);
- Akhaltsikhe-Ude - 2025 (postponed for two years)²⁴.

Competent Agency in Managing Crisis Situations and Protected Customers in Georgia

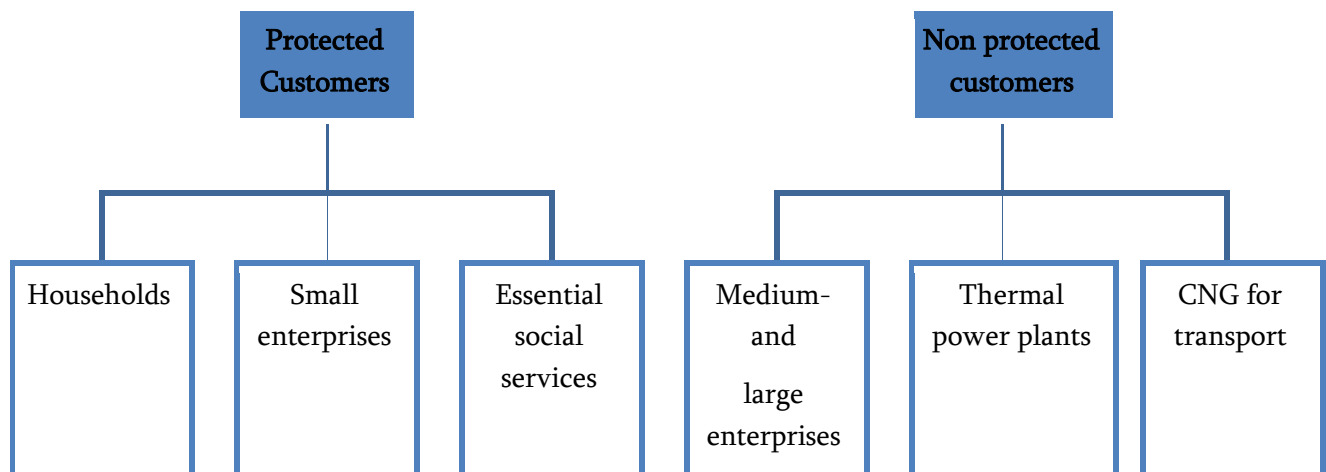
According to the first paragraph of Article 132 of the Law, ensuring the security of electricity and natural gas supply is the competence of the Ministry of Economy and Sustainable Development. In accordance with the first paragraph of Article 143, "the safety of natural gas supply in Georgia is supervised by the Ministry, in cooperation with the Commission and, in appropriate cases, other competent state bodies and the operator of the natural gas transmission system." In addition, the Ministry of Economy and Sustainable Development is also defined as a competent agency in the draft Rules on the Security of Natural Gas Supply.

²³ "Short-term forecast of natural gas consumption and plan for the rehabilitation and construction of main gas pipelines", 2022. Teimuraz Gochitashvili, GOGC.

²⁴ Source of information regarding deadlines: LLC "Owner of the Georgian Natural Gas Transmission Network"

Until September 30, 2021, paragraph 4 of Article 4 of the Natural Gas Market Rules approved by the Order of the Minister of Energy of Georgia dated December 29, 2006 N114 remained in force, according to which, in the event of a shortage of natural gas, the supply should be maintained primarily to thermal power plants that generate electricity through natural gas.

However, according to the law, in a crisis situation, Protected Customers were redefined as a “household customer and small enterprise connected to a natural gas distribution network, and essential social service connected to a natural gas distribution or transmission network, as well as district heating installations to the extent that they deliver heating to the abovementioned customers, provided that these installations are not able to switch to other fuels and are connected to a natural gas distribution or transmission network”. In addition, it should be noted that the chapter on security of natural gas supply in the law entered into force on September 30, 2021, with the implementation of which, as of today, the priority category is the above-mentioned "protected consumers".



Although thermal power plants are no longer included in this definition, the issue of prioritizing some of them may still be on the agenda in the future, given the upcoming process of transposing²⁵ the new regulation 2017/1938 into an Energy Community. According to its Article 11 (7) (a), at the request of a gas transmission system operator in an emergency, a Member State may give preference to the gas supply of certain gas-fired thermal power plants over certain categories of Protected Customers. However, in this case, it should be justified that the disconnection of specific thermal power plants in a critical situation will cause great damage to the functioning of the electricity system or it is vital for the purposes of gas production and transportation. All the requirements of this regulation are reflected in the safety rules of natural gas supply, which is being worked on and it is planned to approve the document by the end of this year.

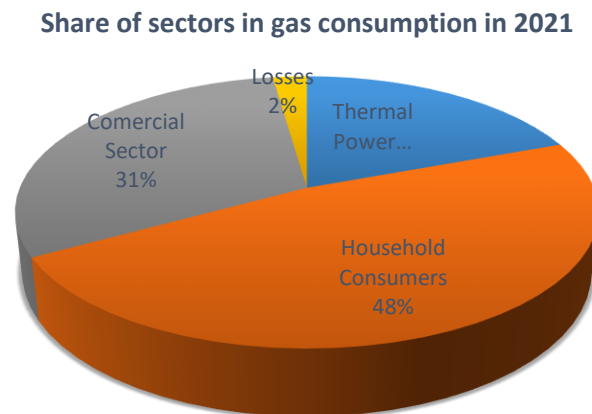
As the district heating systems do not exist in Georgia, only household customers, small enterprises and essential social enterprises will be included in the category of Protected Customers. However, the definition of small enterprises needs to be clarified by the government, although its general definition is set out in the Law on Energy and Water Supply. Before that, in relation to small enterprises, we can use the assumption

²⁵ The mentioned regulation is already a mandatory norm in the Energy Community, on which the Council of Ministers made a decision at the end of November 2021.

according to which we can consider in this category those enterprises whose annual consumption does not exceed 100,000 m³ per year. As for the essential social services, their exact list is determined by the "Rules on the Security of Natural Gas Supply". At this stage, according to the draft rules, the list includes:

- Government administrative bodies, including ministries and their sub-departmental institutions;
- Penitentiary system;
- Healthcare system;
- Kindergartens;
- Orphanages;
- Shelters;
- Educational system;
- Bread factories;
- Zoo;
- Railway system;
- Airports;
- Harbors;
- Water pumps;
- Telecommunication facilities;

which are connected to the gas transmission or distribution system. According to the data of 2021, in general, different sectors of Georgia consumed approximately 2,564.23 million m³ of natural gas.



The highest share of consumption comes from the household sector - 1221.35 million m³, which is almost half of the total consumption.

Since information on small enterprises and essential social services is not yet available for 2021, the data is taken from the 2020 Natural Gas Security of Supply Statement (which Georgia submitted to the Secretariat of the Energy Community in accordance with the requirements of the founding treaty establishing the Energy Community) with calculations based on 2019 figures. According to the data 5% of the total consumption of natural gas was consumed by small enterprises, and 3% by social institutions.

Thus, taking into account all the available data and assumptions, the total gas consumption in 2021 can be represented by the following percentages:

	Gas Consumption, mln.m ³	Share in total consumption, mln.m ³
Total Consumption	2,564.23	100.0%
Thermal Power Plants	495.66	19.3%
Household Consumers	1,233.24	48.1%
Medium and Large enterprises	410.24	16%
CNG for transport	161.00	6.3%
Small Enterprises	128.2	5%
Essential Social Services	76.92	3%
Losses	57.42	2.2%

Based on the above information, it can be concluded that the consumption of natural gas by "protected consumers" (household consumers, small enterprises and Essential social services) reached 1438.36 mcm, which is about 56.1% of the total consumption of Georgia in 2021, however, this figure needs further study and verification after the level of consumption of small enterprises will be determined by the government and the final list of institutions of essential social services will be determined in the rules of security of natural gas supply, which is planned to be adopted during 2022, as mentioned above.

Supply Standards

In general, with regard to the security of supply standards, it should be underlined that the current Natural Gas Market Rules set reliability standards, which are as follows:

- The natural gas transportation licensee is obliged to keep the natural gas transportation network connected to the systems of neighboring countries in good condition.
- The natural gas transportation licensee shall plan and operate the system in such a way as to ensure the stability of the natural gas transportation system even when one or more elements (devices) of the natural gas supply system of the transportation system fail due to natural disaster, diversion, accident or other events.
- In the event of a natural gas shortage caused by a natural disaster, diversion, accident, or other event in the transmission system, natural gas shall be allocated in accordance with the principles of necessity and fairness. In case of natural gas shortage, the natural gas transportation licensee is obliged to provide natural gas primarily to the direct consumers who generate electricity through natural gas.

It should also be noted that at this stage, GNERC has initiated administrative proceedings of the draft resolution for approving Service Quality Rules which aims to improve the commercial quality of services

provided by the enterprise to its customers and provide reliable and uninterrupted supply of electricity, natural gas and drinking water.

According to it, in case of unplanned outage - the enterprise is obliged to immediately inform the customers in the relevant area, but no later than 3 hours after the launch of the outage, the exact reason for the outage and the estimated time to restore supplies. The customer is considered informed if the interruption is eliminated within the time specified in the notification with an allowed error interval of not more than 2 hours.

If the supply is interrupted to not less than 3,000 customers in a self-governing city and not less than 500 customers in another municipality, the enterprise shall also publish the relevant information on its official website. In addition, the enterprise is obliged to eliminate internal unplanned interruption (common standard) within no more than 12 hours;

As for the supply standards in the meaning of the regulation 2017/1938, It should be underlined that according to the Law of Georgia on Energy and Water Supply, the Ministry, in cooperation with the Commission and other competent state bodies, will develop security standards for natural gas supply, which shall include, among other things, the tools used by a natural gas enterprise and measures taken to ensure natural gas supply to protected customers in:

- a. *extreme temperatures during a 7-day peak period occurring with a statistical probability of once in every 20 years;*
- b. *any period of at least 30 days of exceptionally high gas demand, occurring with a statistical probability of once in every 20 years;*
- c. *for a period of at least 30 days in case of the failure of the single largest gas infrastructure under average winter conditions.*

At this stage, a legal act specifically stating the terms or conditions for compliance with the above supply standards has not been developed yet. It is also noteworthy that the entire Chapter of Supply Security (XXXIV) in the law, which sets the above said standards, enters into force from September 30, 2021.

However, in order to ensure compliance with these standards, the ministry plans to start working to identify particularly high demand for natural gas which should be based on the recent high demand and consumption forecast rather than statistical probability of once in 2020 years, given the specifics and development of Georgia's gas sector. Georgia's gas consumption profile has taken a new turn after the collapse of the Soviet Union and the cessation of industrial activities. In addition, the population has been actively gasified for the past decade and some gasification works are planned in the future as outlined above. Gas consumption has also increased in transport sector in recent years.

The extreme temperatures of the 20-year statistical probability need also to be explored, and the usual winter conditions are additionally to be determined. The global warming trends should also be taken into account. Studies on climate change in Georgia have shown that temperatures have risen in Georgia over the last 20-25 years²⁶.

²⁶ <https://www.kvirispalitra.ge/public/30250-qklimatis-cvllilebis-scenari-arasakharbieloag.html>

However, according to the Meteorological and Climatology Division, abnormal temperatures have been repeatedly observed in the country. The coldest winters of the last 15 years were in February-March 2012 and in 2014, during which the temperature in Tbilisi dropped to -15 °C. It was a cold spell in winter of 2008²⁷ as well. The coldest winter in Georgia was recorded in 1972. The average temperature for all three months of this season was -4.5°C throughout Georgia. The air temperature in Gori dropped to -26 °C²⁸.

It should also be noted that there is a degree day definition, which is a measure of the severity and duration of cold weather²⁹, according to which natural gas consumption is considered to increase below 15.5 °C due to the switching on heating appliances and the second stage is 9.3 °C below which consumption increases intensively in proportion to the decrease in temperature.

At this stage, for the purposes of the security of supply analysis, the highest rate of gas consumption of the winter season (December, January, February), which was recorded on January 20 of the current year, is relevant. In particular, on this day the consumption was 16.07 million m³, where the share of the population was quite voluminous and reached 8 million m³. As for the peak week of the winter season, according to the gas transportation data of Georgia, the peak consumption days are January 14-21, when Georgia consumed a total of 109.5 million m³. The peak month was also January in 2022, and the total consumption during this period was 442 million m³, which is significantly higher than the figures of the past years.

Peak Consumption for the last six winter seasons

	<i>2016 -2017</i> <i>mcm</i>	<i>2017-2018</i> <i>mcm</i>	<i>2018 – 2019</i> <i>mcm</i>	<i>2019-2020</i> <i>mcm</i>	<i>2020-2021</i> <i>mcm</i>	<i>2021-2022</i> <i>mcm</i>
Peak day demand	13.8 December	13.4 February	13 December	15.4 January	14.2 December	16.07 January
Peak Week demand	95 December, IV week	80 January, IV week	86.4 February, III week	104 20-27 January	93.506 December, IV Week	109.5 January, III Week
Peak month demand	395.8 December	336.3 December	361.4 January	427 January	393.04 December	442.9 January

During peak consumption, when there is no supply disruption, gas is supplied via pipelines connecting with Azerbaijan and Russia. In regular conditions, the existing contracts and the technical capacities of the interconnectors at this stage are sufficient to ensure the gas supply to the consumers in Georgia. However, given the economic recovery envisaged and increase in consumption in the future, without taking additional

²⁷<https://www.allnews.ge/saintereso/150897-rodix-dapiksirda-qvelaze-civi-zamtari-sakartveloshi/>

²⁸ <https://radiomosaic.ge/index.php/2018-07-05-18-48-33/3529-2018-12-25-08-31-21>

²⁹ It shows the difference between the outside temperature and the base temperature. The base temperature represents the balance point, i.e. the minimum temperature of the environment, under which there is no need to heat the building. If the daytime temperature is lower than the baseline, heating is required on such a day, and the difference between the temperatures is the degree day of that day.

measures, the country will face difficulties due to insufficient cross-border and internal infrastructural capacities, as well as limited contractual volumes of gas.

At this stage, actually there is no crises level defined yet in the meaning of the security of supply regulation 2017/1938 and no competitive market developed to simulate the security of supply shortage. Thus, it is early to define market based measures based on its specificity. However, some market based measures could be listed as assumptions such as:

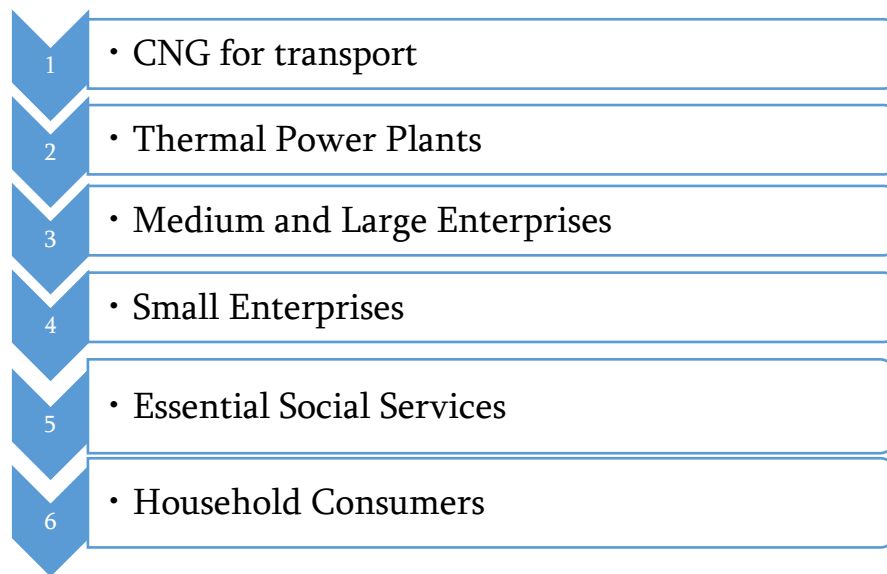
- Increased supplies / imports via available routes / sources
- Enhanced use of linepack
- Invitation to consumers to voluntarily moderate their demand

As for the non market-based measures which are to be applied during the emergency, the country will possibly opt for:

- Increased electricity imports and/or generation from alternative sources
- Allocation of available capacity and gas according to priority / merit order and disconnection of customers.

In the event that an emergency situation develops in the country and it becomes necessary to use non-market mechanisms, the general sequence of gas supply restrictions can be roughly formulated as follows:

Merit order for disconnections



However, despite this provisional sequence, it may not be strictly followed and certain combinations may be made depending on the particular case and the circumstances of that time. For example, in the field of electricity generation, the supply may be maintained to certain thermal power plants or reduced proportionally to all of them according to the needs of the electricity dispatch center. Also, industrial-technological processes of large industrial consumers need to be taken into account. In this case, gas supply to certain enterprises may not be completely disrupted but reduced up to a pre-established minimum threshold.

In this regard, it should be noted that the investigation carried out by the EnCS in the framework of the assistance provided to Georgia on the issues of the Natural Gas Emergency Management plan revealed that:

- Sudden interruption of gas supply may cause permanent damage to the production of ammonia in JSC Rustavi Azoti. The minimum gas supply level of JSC Rustavi Azot is 3500 m³/h. (For safe stopping, JSC Rustavi Azoti has to be informed at least 2 days in advance).
- According to Knauf Gyps Tbilisi, which manufactures construction materials, the gas outage (infrequent) does not cause technical damage to the equipment, but will cause significant material damage as a result of defective products.
- According to Mina Ltd., which produces glass, the plant has an emergency plan to switch to liquid fuel in case of natural gas disruption but this plan does not consider immediate interruption of natural gas and requires some time. The production of glass is a continuous cycle, its careless or sudden shutdown will inevitably cause the glass to freeze in the furnace, after which the furnace must be destroyed in the glass oven. They need 10 hours to switch to liquid fuel while the daily loss could be GEL 166,307.23.
- According to the steel manufacturer Rustavi Foladi, their equipment can be switched off 10 hours in advance without any technical damage, and the minimum gas supply level is 1500 m³/h.

Therefore, the Ministry plans to study all medium and large enterprises in detail in the future and draw up a disconnection order based on this type of analysis. Thus, the competitive effect on market players as a result of disconnections has to be further explored.

As for the duration of disconnections, it should be noted that based on the information enquired by the GGTC from the distribution companies for the purposes of this SoS statement showed that the distribution companies disconnect certain categories of customers manually and there is no remote system to turn them off them. In addition, it depends on several factors, namely: working hours, days off, number of customers in the category, customer category, area of operation, etc. Consequently, these activities may take different time. For example, in the Tbilisi area, according to Tbilisi Energy, this time period varies from 2 to 8 hours, and according to SOCAR Georgia Gas and Sakorggas, in normal cases, if we do not take into account the above circumstances, gas supply can be cut off for a maximum in half an hour.

As for the disconnection of the customers connected to the transmission system, based on the information of the relevant dispatch center, the disconnection activity will take 5-10 minutes.

Therefore, these circumstances should be taken into account while drawing up the emergency response plan.

Limit of Technical Parameters in the Natural Gas Transportation System

The gas transportation system of Georgia operates in the pressure range of 9-25 bar, where specific sections need to maintain appropriate technical parameters for proper and reliable functioning of the system. From the point of view, the following sections are important:

1. The existing air turbine thermal power plants in the Gardabani region, the pressure in the pipeline system must be at least 14 bar for proper operation.

2. It is also important that the pressure of natural gas in the pipeline system should be at least 17 bar in order to maintain the working pressure in the west (Adjara) direction.
3. In order to provide gas supply in the Adjara region with appropriate parameters, a pressure of at least 8.5-9 bar is required in the pipeline system.

Accordingly, in order to maintain the proper operation and technical characteristics of the gas supply system of the mentioned sections, in case of deterioration of the threshold parameters, it is necessary to add natural gas to the system as a balancing action³⁰.

Regulatory framework for providing adequate incentives for new investments in areas such as storage, LNG and gas transportation

The Law of Georgia on Energy and Water Supply establishes certain preferential conditions (exemptions) for new natural gas infrastructure, which serves to ensure security of supply. In particular, pursuant to its article 100, at the request of the natural gas plant, significant new natural gas infrastructure, including the interconnection, the natural gas storage facility and the liquefied natural gas facility, may be exempted for a limited time from obligations regarding unbundling, third party access and tariff regulation if all of the following conditions are met:

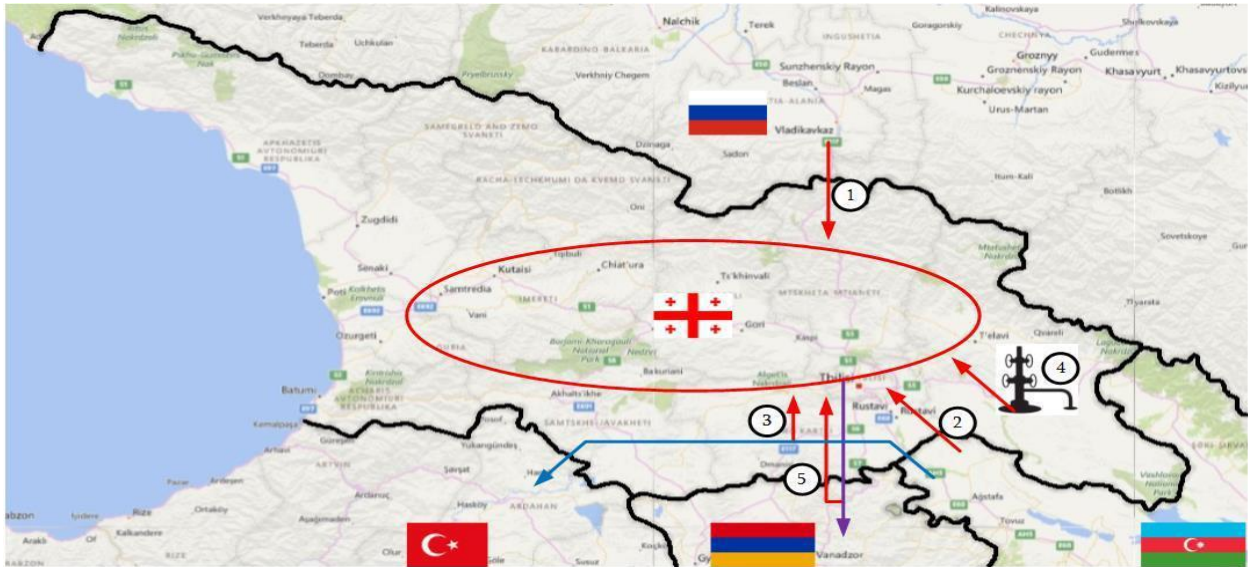
- a) infrastructure investment promotes competition in natural gas supply activities and improves security of supply;
- b) the investment is impossible due to the associated risks without granting the exemptions;
- c) the person who owns the infrastructure is at least legally unbundled from the system operator in whose system the relevant infrastructure is to be built; d) infrastructure users will be obliged to pay the fee;
- d) the establishment of preferential conditions shall not prejudice competition and the effective functioning of the internal gas market or the regulated system to which the relevant infrastructure is connected.

These exemptions are also used in cases of significant increase and transforming of existing infrastructure capacity, if the opportunity arises to develop new sources of natural gas supply. The decision on exemptions is made by the Commission on a case-by-case basis based on the above criteria.

Maximum Quantity of Gas Flows in the Critical Period

Today the transportation system has 7 entry points out of which 3 represents the entry points from local extraction. Information about each item is given in the figure:

³⁰ Source: GGTC, Dispatch Control Center



As outlined above, natural gas to Georgia is supplied by Azerbaijan State Oil Company SOCAR, the South Caucasus Pipeline Consortium and Gazprom Export.

Technical and contractual parameters of cross-border gas infrastructure:

<i>Entry points</i>	<i>Throughput capacity, mcm/d</i>	<i>Contractual volumes mcm/d</i>
North South Pipeline (Russian border)	4.2; (≈ 8) ³¹	200 per year. There is no daily limit. (4.2)
Kazakhi-Saguramo (Azerbaijani border)	8	8.0 (from this volume Georgia gets 1.1 from the South Caucasus Pipeline)
South Caucasus Pipeline (Gardabani, entry point for receiving Shah Deniz gas)	5.4	4.1 (supplemental gas-2, optional gas-2.1)
Total	19.6 ³² ; (≈ 23.4) ³³	(16.3)

Risk Scenarios

It is worth mentioning that there are a number of challenges and threats in terms of security of supply in the country, which may be related to:

- Outdated infrastructure;
- Lack of sources of supply;

³¹ The maximum capacity of the pipeline is 4.2 mcm/d without limiting the transit from Russia to Armenia. Georgia can receive 8 m/d of natural gas if certain conditions are met, such as Armenia's low consumption level or agreement to give up their share of transit gas and providing appropriate pressure from Russia;

³² This value indicates the situation when transit gas is supplied to Armenia with the maximum limit and the existing pressure limits are maintained from the Russian side;

³³ This value is in the event that the demand for gas in Armenia decreases and the maximum flow of gas (8 mcm/d) can be obtained from the Saguramo, and the supply of gas from the receiving sources will be ensured at the appropriate pressure.

- Insufficient production and import dependence;
- Seasonal inequality of supply and consumption;
- Geopolitical tensions in the region;
- Lack of strategic reserve;
- Coronavirus pandemic;
- Increased natural disasters;
- Investment deficit

Taking all these factors into account, there are many risks in the internal system, which can cause problems in the whole system as well as in its certain areas. However, the main scenarios that could lead to serious gas shortages across the country and affect the functioning of the market are related to the restriction of gas inflows through interconnectors. In this case, the task of Georgia will be to mobilize the maximum volumes of gas through the remaining cross-border connectors and distribute it according to the priority described above.

In addition, it should be noted, that despite the relatively modest share of Russian gas in Georgia on an annual basis (15% in 2021), the country still remains significantly dependent on Russian gas during the peak days of the winter season. Therefore, facing latest global challenges, which are related to the tension in the region and the situation in Ukraine, to ensure the security of gas supply in general and the implementation of the gas storage project becomes especially important.

Infrastructure standard

The infrastructure standard implies that in the event of the disruption of one of the largest gas infrastructures, the technical capacity of the rest of the infrastructure (defined by Formula N - 1) to meet the total gas demand in the calculated area in case of exceptionally high demand for gas during the day.

Below is the current level of compliance of the transmission system with infrastructure standard envisaging the situation when transit gas flows to Armenia are at maximum level, current pressure is maintained and due to it, reverse route cannot be applied. For visibility, its scale is also calculated for other cases including the construction of a gas storage facility.

$$N - 1 [\%] = \frac{\frac{19.6\text{mln}}{d} + \frac{0,05\text{mln}}{d} - \frac{10\text{mln}}{d}}{16.7\text{mln}} \times 100 \approx 58\%; \quad N - 1 \leq 100\%$$

where:

The calculated area is the territory controlled by Georgia; The sum of maximum technical capacities is 19.6 mcm/d;

The average daily production is -0.05 mcm/d (data from 2021)³⁴;

Kazakh Saguramo (10 mcm/d) is considered to be a large infrastructure;

³⁴ Source: State Agency of Oil and Gas

Peak consumption day 16.7 mcm/d, recorded in March 2022.

Since the obtained number should be equal to or greater than 100, it can be said that Georgia does not meet the infrastructure standard in this case.

Below is the case when transit to Armenia is reduced due to low demand or prior agreement with Armenia and the maximum gas flow can be taken from all pipelines:

$$N - 1 [\%] = \frac{23.4\text{mtn/d} + 0,05\text{mtn/d} - 10\text{mtn/d}}{16.7\text{mtn}} \times 100 \approx 83.2\% \quad N - 1 \geq 100\%$$

where:

The calculated area is the territory controlled by Georgia; the sum of maximum technical entry capacity of pipelines is 23.4 mcm/d;

The average daily production is -0.05 mcm/d (data from 2021);

Kazakh-Saguramo (10 mcm/d) is considered to be the single largest infrastructure;

Peak daily consumption is 16.7 mcm/d recorded in March 2022.

In this case, the infrastructure standard parameter is significantly improved, but since the obtained indicator should be equal to or exceed 100, it can be said that we do not meet it in this case either.

Case of a Gas Storage

For visibility purposes, the cases of the construction of the gas storage are considered below while calculating Infrastructure standard.

$$N - 1 [\%] = \frac{19.6\text{mtn/d} + 0,05\text{mtn/d} + 6\text{mtn/d} - 10\text{mtn/d}}{16.7\text{mtn}} \times 100 = 93.7\% \quad N - 1 \geq 100\%$$

where:

The calculated area is the territory controlled by Georgia; the sum of maximum technical entry capacity of pipelines is 23.4 mcm/d;

The average daily production is -0.05 mcm/d (data from 2021);

Kazakh-Saguramo (10 mcm/d) is considered to be the single largest infrastructure;

Peak daily consumption is 16.7 mcm/d recorded in March 2022

It should be noted that the infrastructure standard improves in this case, however, if the large infrastructure is shut down for more than 1 day, this percentage will further deteriorate, since this amount of gas extraction from the gas storage is possible only in emergency mode for one day. A certain amount of gas will also be available at the expense of linepack, but since according to the supply standard this infrastructure standard must be met within a period of 30 days, the situation in this regard cannot be extended favorably in the event of a crisis. In addition, if we take into account that in the case of building a gas storage, the day of peak consumption will most likely be longer, this figure will be even lower.

It is also noteworthy that the implementation of the gas storage project, which was actively considered in pre-pandemic period, was delayed due to the lack of financial resources as a result of COVID spread. Based

on the recent decision, the loan provided by KfW for the storage has been redirected to the state budget to address health and social issues.

It is also important to note that in November 2021, the decision of the Council of Ministers in the Energy Community implemented the transposition of the adapted version of the EU Regulation 1938/2017 regarding the security of gas supply, according to which Georgia is exempted from meeting the infrastructure standard as long as it is not physically connected to any contracting party of the Energy Community or will have a gas storage. Nevertheless, it should be emphasized that ensuring energy security is important for Georgia despite this derogation. Therefore, building a gas storage facility (or an alternative means of balancing seasonal and hourly supply/consumption) is of strategic importance, as it improves the percentage of the infrastructure standard, and if this is added to the agreement with Armenia on assistance in emergency situations, as a result of which it will be possible to give up a certain volume of transit gas to Georgia, then there is a probability, that the infrastructure standard will be met in the future.

Crisis Management in Terms of Legal Aspects

Pursuant to the law of Georgia on Energy and Water Supply, in particular, under the paragraph 1 of Article 132 the insurance of security of electricity and natural gas supply falls within the competence of the Ministry, which shall develop a strategy for emergency response in the electricity and natural gas sectors. It should be stressed that under the Law, the Commission and other state bodies, within their competence, promote the security of supply in accordance with this Law and other legal acts.

The Ministry is also obliged to develop a national emergency management plan in the natural gas sector in consultation with natural gas enterprises, natural and industrial gas consumer protection organizations and the Commission, which according to the Law should include, inter alia:

- Crisis levels;
- Tasks and responsibilities of the Ministry for each crisis level and the bodies to which the tasks have been delegated as well as the functions and responsibilities of natural gas enterprises and industrial customers including relevant electricity producers;
- Detailed procedures and measures to be implemented at each crisis level including appropriate information exchange schemes;
- Defines the crisis management person or group of persons and their role in the crisis management process;
- Market mechanisms in the process of emergency management at a certain crisis level as well as the role of non-market mechanisms to be implemented or planned during the emergency and the procedure for their implementation;
- Mechanisms for cooperation with other parties to the Energy Community at each crisis level.

As the relevant chapter on the security of natural gas supply entered into force from September 30, 2021, there is no specific emergency management plan for these provisions yet, and no crisis levels have been defined. It should be emphasized that the EnCS prepared a report on the recommendations regarding the content of this plan within the framework of the EU4Energy Governance project. The report will be used by the Ministry in drawing up the emergency management plan in accordance with the new commitments.

In addition, as highlighted above, work on the draft rules for the security of natural gas supply is underway. The crisis levels and the list of the main social purpose institutions are spelled out in the document.

Along with the aforementioned direction to include new requirements and elements on market functioning during emergencies, certain emergency management practices and relevant legislation have been introduced over the past years, although it should be noted that the main focus on crisis response and preparedness is the area of civil security, which is regulated under the law of Georgia of 2018 on Civil Security and its implementing regulations. In particular, it entails the provision of technical response to incidents, relevant field operations, and close coordination and cooperation with the Emergency Management Agency. This service is a sub-structure of the Ministry of Internal Affairs of Georgia which coordinates the activities of all state agencies and ensures the organization of emergency prevention, unified system preparedness, emergency response and rehabilitation works in the emergency zone, and the implementation of the National Civil Security Plan (NCSP) to address civil security objectives.

Specifically, function 9 of the NCSP refers to the provision of Energy Supply. In this context, the main responsible and central body is the Ministry responsible for the energy sector. It should be mentioned that after being notified of an emergency, the Ministry ensures the official visit of an authorized person to the Inter-agency Operational Center³⁵. Based on the decision of this center, the Ministry starts implementation of the relevant measures (Function № 9). Accordingly, the following mechanisms are activated:

- ✓ Emergency Headquarter of the Ministry, which works in accordance with the Emergency Management Plan of the Ministry³⁶;
- ✓ Primary Response Team;
- ✓ Private legal entities licensed in the field of energy participate in all emergency management operations together the Ministry

The emergency assistance function is performed and coordinated by the Emergency Headquarter of the Ministry. Emergency Headquarter:

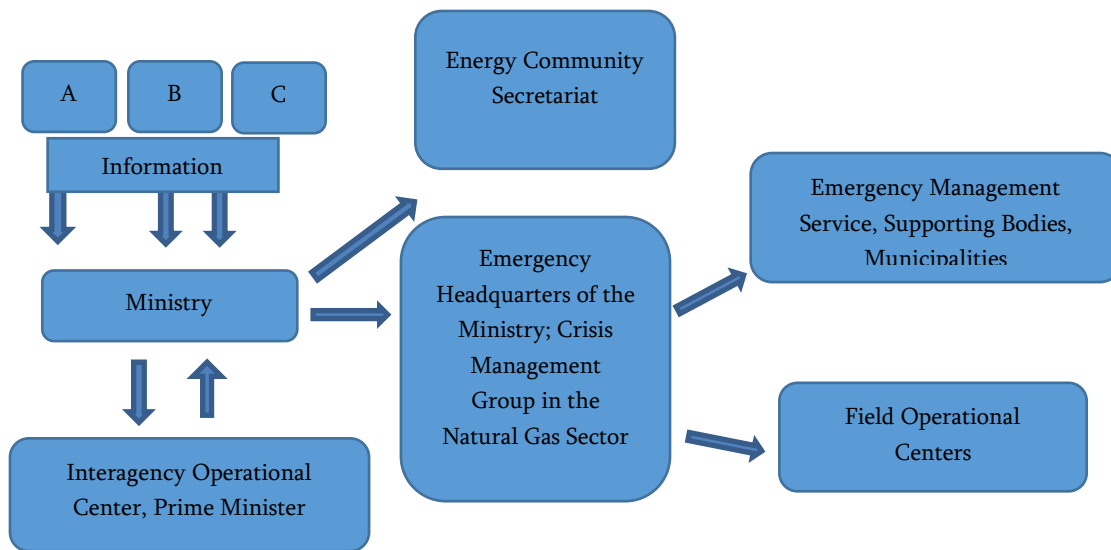
- Operates in accordance with the emergency management plan developed by the Ministry;
- Coordinates with other structures to prepare timely and accurate information, recommendations and advice for the prevention of emergencies as well as for the elimination of its consequences;
- Conducts consultations with relevant interested organizations;
- Determines the damage caused by emergency situations in the field of energy;
- Assesses the emergency situation, determines the necessary resources;
- Ensures timely delivery of information and recommendations;
- Ensures the business trip of an authorized person to the Inter-authority Operative Center established in the Emergency Management Service subordinated to the Ministry of Internal Affairs of Georgia;

³⁵ A body created by the Prime Minister of Georgia from the authorized persons of the institutions of the executive power of the unified system, which organizes and coordinates the response to the expected or emerging emergency situation at the operational level. The activities of the Interagency Operational Center for Emergency Situations Management are directed by the Prime Minister of Georgia or a person authorized by him; (Law of Georgia on Civil Security);

³⁶ The mentioned plan should be developed in accordance with the government's resolution N452 of October 6, 2017 (rules for the preparation of the emergency management plan) by the competent ministry, which should be agreed with the Emergency Management Agency.

- Provides information to the Inter-agency Operational Center, Municipal Operational and Field Operation Centers;
- Participates in loss assessment studies in order to minimize the total amount of losses in the future;
- Makes recommendations to the Inter-agency Operational Center which, accordingly, coordinates the field operations;
- May appoint a representative to the Field Operation Center;
- Deploys representatives who, if necessary, should be immediately present in the emergency zone together with the primary response team.

Current Communication Scheme:



Relations between the Ministry and the energy companies will be defined in details in the Security of Supply Rules for Natural Gas, which will enter into force by end of 2022. Based on the above mentioned, the roles and competencies of energy enterprises will be defined and their individual response plans will be accordingly adapted in future. The plans will also be in line with the Natural Gas Emergency Management Plan to be prepared by the Ministry taking into consideration new commitments. The draft rules also envisage formation of a Crisis Management Group in the Natural Gas Sector³⁷, which will strengthen the country's resilience and response to crises. The establishment of a similar type of group in the field of electricity is already provided by the Security of Supply Statement in Electricity Sector, which was approved by the Order N1-1/520 of the Minister of Economy and Sustainable Development of Georgia dated December 2, 2020. The integrated work of these groups will be important, since the crisis developed in one sector can affect the proper work of the other sector, and therefore, the role of the Ministry as a coordinator is important in this regard.

³⁷ This group will be composed of permanent and non-permanent members. Permanent membership is granted to the ministry, which will invite the commission, natural gas transmission system operator, major natural gas distribution system operators, major gas traders/suppliers and emergency management agency. Non-permanent members will be invited to the sessions of said group as needed. Their composition may include the electricity transmission system operator, large natural gas consumers, thermal power plants, electricity traders and other relevant stakeholders.

There are other types of important documents related to the security of the country as a whole, covering energy security from different angles. For example, according to the Law of Georgia on the National Security Planning and Coordination, the main guiding document of the security policy is the Concept of National Security, to which all documents of national and departmental level of national security policy planning must comply, and which includes energy challenges and aspects of the energy security aspects of the country. On the basis of the Law of Georgia on National Security Planning and Coordination under the leadership of the office of the National Security Council in cooperation with various departments, a threat assessment document was developed. The document among other areas of national security identifies energy threats, risks and challenges and includes risk forecasting and related security mechanisms. This document is confidential and is currently being updated.

At the same time, within the framework of the National Security Council, a reform is underway to identify and protect critical infrastructure on the basis of which strategic national security plans and relevant action plans will be developed both at the national and authority levels³⁸.

With regard to regional cooperation, certain practices and cooperation with neighboring countries have been established. Georgia has a long-term strategic partnership with Azerbaijan. For example, during the crisis caused by the disruption of Russian gas supplies in 2006, Azerbaijan provided assistance in gas supplies to Georgia and, as a sign of solidarity, even limited some categories of domestic consumers in favor of Georgian consumers.

However, the mechanisms of cooperation which the legislation of the European Union and the Energy Community envisage, cannot be applied to neighboring countries in a binding manner. Nevertheless, in both electricity and gas, Georgia will endeavor to formally introduce the practice of mutual assistance with neighboring countries the critical need of which has been well demonstrated in the parts related Infrastructure Standards and Scenarios above.

It should be mentioned that within the framework of the Association Agreement with the European Union, Georgia has an obligation to notify the EU in advance regarding the expected delays of flows in transit pipelines in the format of early warning mechanism.

In conclusion, it could be stressed that despite some conditions already present in Georgia there is still much work ahead to ensure the security of supply in the country at sufficient level. The ministry properly realizes necessary tasks and as the main body responsible for the energy security plans to activate works from many perspectives including the development of comprehensive legal framework fully reflecting EU/EnC requirements, analyzing security risks, drafting preventive and emergency plans, expiring supply sources to replace the expiring volumes (the contract for supplemental gas expires in 2026) as well as additional sources to meet increasing demand after the economic recovery, developing necessary infrastructure and etc. for which it significantly relies on EnCS support and donor involvement as well.

³⁸ Source: Office of the National Security Council

Sources:

- *Law of Georgia on Energy and Water Supply*
- *Natural Gas Market Rules*
- *REGULATION (EU) 2017/1938 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning measures to safeguard the security of gas supply and repealing Regulation (EU*
- *Draft Rules on the Security of Natural Gas Supply*
- *No 994/2010 Law of Georgia on National Security Planning and Coordination*
- *Public articles*
- *Law of Georgia on Civil Security*
- *National Civil Security Plan*
- *GNERC 2021 Report*
- *10 year gas infrastructure development plan prepared by GOGC, November, 2020*
- *Oil and Gas Sector of Georgia in the Transition Period by Teimuraz Gochitashvili*
- *Commercial and technical data of GGTC and SAOG*
- *Consultations with the GOGC and GGTC*
- *Natural Gas Supply Application, 2020*