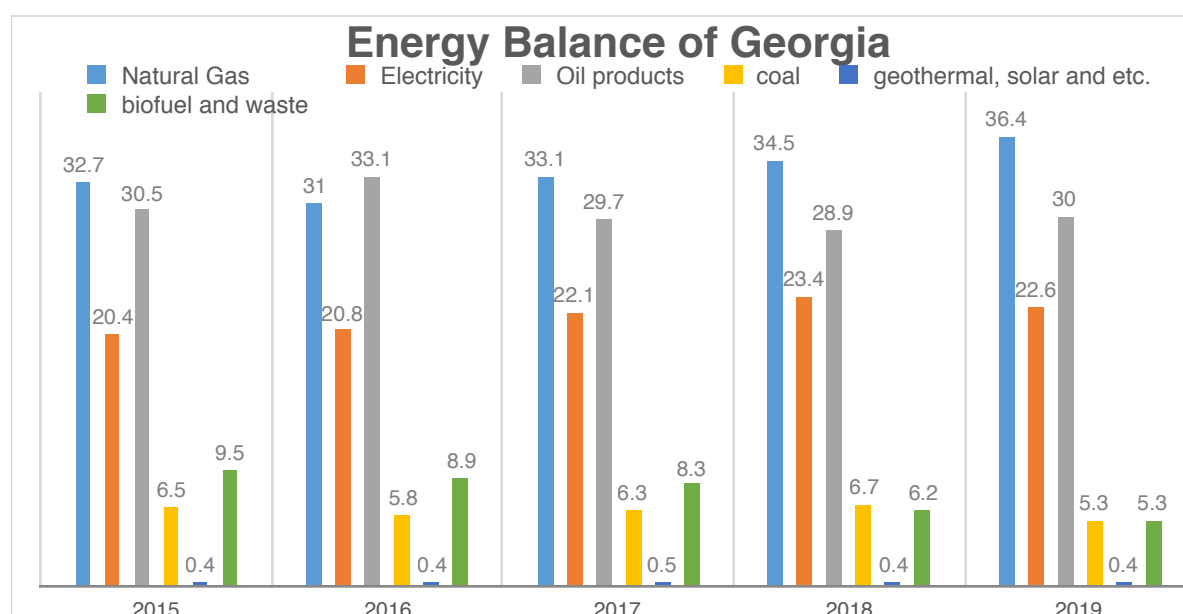


## SoS statement for Natural Gas

### 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 underlined that 84% of the country was gasified by 2019 and the government's plan envisages providing gas to all those settlements the gasification of which is reasonably appropriate.

According to Energy Balance of Georgia developed by the Geostat, the share of natural gas in the total consumption of energy equaled to 36.4%<sup>1</sup> in 2019.



In the structure of energy consumption, in 2019 36.4% was attributed to natural gas. Relatively high shares are also assigned to oil products (30.0 %) and electricity (22.6%). 5.3% of the energy consumed during the year is biofuels and waste energy, while the remaining 5.7% comes from coal and geothermal energy.

In recent years the share of biofuels and waste has been noticeably reduced, one of the reasons for which may be active gasification and replacement of solid fuels by natural gas. In case of realization of the gasification plans of the Government of Georgia for 2019-2021 and 2022-2024, the level of households having 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

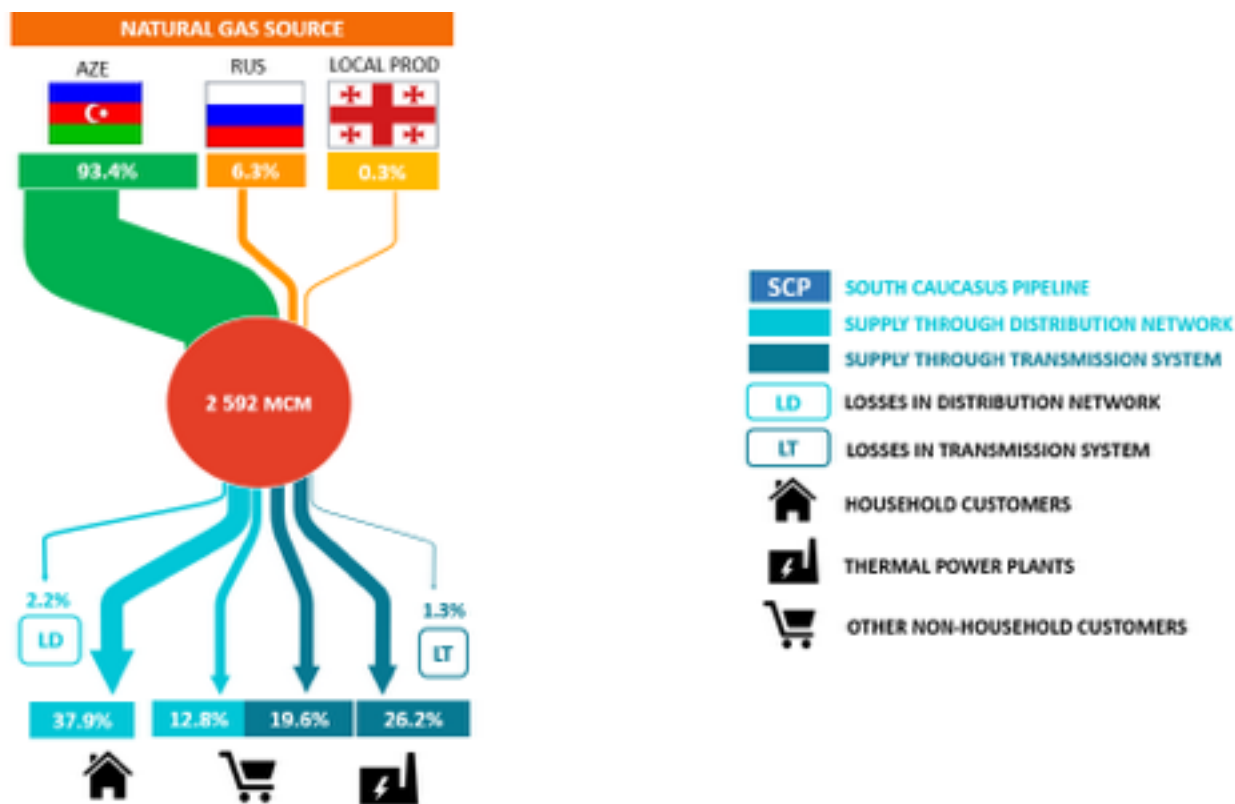
<sup>1</sup> Energy Balance of Georgia 2019, source: Statistics office of Georgia

similar terrain like Georgia.<sup>2</sup>. Thus, Georgia will have one of the highest rates of gasification in Europe.

### Supply sources and contracts

In 2019, 99.8% of Georgia's demand for natural gas was met by import and the remaining 0.2% by domestic production. In 2019, natural gas was supplied to Georgia from 4 sources. The main source remains the Republic of Azerbaijan (from Azerbaijan-1229 mcm; from Russia- 162 mcm; from South Caucasian gas pipeline- supplemental and optional gas- 853 mcm, import- 339 mcm; from local extraction-9 mcm).<sup>3</sup>

The figure below illustrates supply of and demand on Natural Gas in Georgia<sup>4</sup> and directions of natural gas flows in 2019.



<sup>2</sup> Source: The government will continue the gasification program until 2024, 27.10.2020: <https://bm.ge/ka/article/mtavroba-gazificirebis--programas-2024-wlamde-gaagrdzelebs/67093/>

<sup>3</sup> Source: GNERC report for 2019

<sup>4</sup> source: GNERC

The figures with respect to supply in 2020 are provided below, covering the period of January - December and for comparison purposes data of equivalent period in 2019 is also given<sup>5</sup>:

	<b>2019, January –December, mcm</b>	<b>2020, January –December, mcm</b>
<b>Total gas entered the system</b>	<b>4758.693</b>	<b>4781.33</b>
<b>Transit to Armenia</b>	2166.916	2208.602
<b>Gas volumes for Georgia</b>		
<b>From Russia</b>	162.378	204.039
<b>From Shah-deniz</b>	1191.029	1157.785
<b>From SOCAR</b>	1229.356	1183.38
<b>Local Production</b>	9.014	8,259
<b>Other source</b>		19.265
<b>Total</b>	<b>2591.777</b>	<b>2572.728</b>

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, the owner of the territory, Georgia has a right to purchase up to 5% of transit gas at preferential price. The contract is valid until 2068.

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

- It will become a transit country of a broader scale and for many destinations and thus, gain political significance (Gas will be supplied to 8 countries through Georgia and Geor-

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<sup>5</sup> Source: GGTC Commercial Department

gia will become an international player. It will also contribute to the energy security of the EU);

- Economic benefits;

So far, the country was receiving up to 330 mcm/y of natural gas at a preferential price, and in a few years this volume is expected to reach 1.1 bcm.

Georgia also receives 500 mcm gas annually at a preferential price (until 2026) and thus, will be able to receive totally 1.6 bcm cheap gas in the future. However, this will be the case if the infrastructure for which the contracts are signed is fully loaded. Turkey is receiving 6 bcm/y and will receive additional 6 bcm. Also, Europe will get 10 bcm and this will be added by supplemental gas of 500 mcm. It is noteworthy that Azerbaijani gas is cheaper than Russian, Algerian or Norwegian gas supplied to Turkey or Europe. However, due to the pandemic, these processes may be delayed by 2-3 years (as happened after the 2008 global financial crisis). It is expected that the pipeline will be fully loaded no earlier than 2024-2025<sup>6</sup>. Such forecast is based on general observations and the statements of SOCAR where it pledges to increase volumes by 2 bcm/y.

In order to guarantee the demand of household and thermal generation facilities, natural gas is supplied to the country within the framework of a memorandum signed between the Government of Georgia and the Azerbaijani SOCAR. According to the relevant gas purchase and sale contract signed with SOCAR, the terms of gas supply to the Georgian market are agreed, however, the certain terms of the contract are under negotiation for 2021 and the contract expires in December 2030. In this respect, gas flows through Kazakhi-Saguramo Interconnector. However, during peak periods there could be cases when some portion of SOCAR gas is supplied through SCP and North South pipeline due to technical reasons.

In addition, gas is supplied at market prices to meet the demand of Georgia's industry and commercial sector, mainly from Azerbaijan.

As for Russia, in 2019, 163 mcm gas was supplied from this source at market prices. 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. Georgia can receive Russian gas through the same pipeline in the amount of up to 200 mcm per year on the basis of an agreement with Gazprom Export.

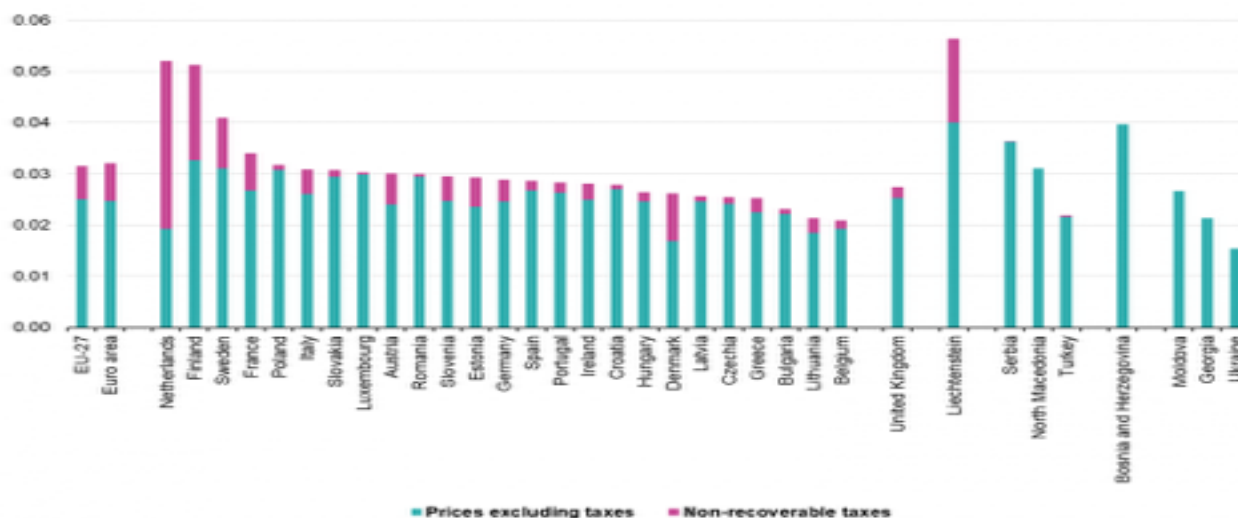
Household consumers belonging to the so called "the Social Sector" are supplied at a tariff regulated by the GNERC, and the thermal power plants - at preferential rate established by the memorandum of understanding between the Government of Georgia and SOCAR and under the relevant contracts. Retail and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

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<sup>6</sup> <https://www.facebook.com/watch/?v=468413977462296>

In recent years, one of the highest end-user price for commercial customers has been observed on the Georgian market. The price is high not only in the region but also compared to some EU countries<sup>7</sup>, placing the Georgian industry in a non-competitive environment.

**Natural gas prices for non-household consumers, first half 2020**  
(EUR per kWh)



Note: Cyprus, Malta and Finland do not report natural gas prices in the household sector.  
Source: Eurostat (online data codes: nrg\_pc\_203)

eurostat

## 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 2018, commercial gas was extracted only from Ninotsimnda and Mtsarekhevi fields and made up about 13 mcm. From 1930 to present 3,3 bcm of gas has been produced in Georgia in total<sup>8</sup>. In the table below there is gas production data of recent years<sup>9</sup>:

Time period	2015	2016	2017	2018	2019	2020 (9 months)
<b>Gas extraction/production, m<sup>3</sup></b>	16 703 000	10 882 000	10 847 000	12 997 000	12 914 000	8 070 920

<sup>7</sup> This implies prices in European countries without VAT

<sup>8</sup> Source: Oil and Gas Sector of Georgia in the Transition Period by Teimuraz Gochitashvili

<sup>9</sup> Source: State Agency of Oil and Gas

Currently, 16 fields are being developed in Georgia, including 15 oil fields and 1 gas-condensate field: Eastern Chaladidi, Supsa, Shromisubani, Norio, Satskhenisi, Samgori-Patardzeuli-Ninotsminda, Samgori South Dome, Teleti, West Rustavi, Mtsarekhevi, Baida, Taribani, Mirzani, Patara Shiraki, Nazarlebi, Rustavi (gas condensate).

Before the pandemic the plans of the closest period envisaged making comparatively more investments in gas exploration and production works and facilitate the activation of geological-exploration works on the territories of Georgia with gas bearing potential. Therefore, following the economic recovery and relevant works carried out afterwards, gas production may be significantly increased in Georgia in future, if the exploration results confirm at least one of the forecast resource data out of prospective areas.

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 the relevant tender and selected the company as the winner. Following negotiations State (represented by State Agency of Oil and Gas) and the company signed the respective Production Sharing Contract on the 10<sup>th</sup> of March. On the basis of the executed contract a license for oil and gas exploration and extraction on the Black Sea shelf will be granted to the oil company OMV Petrom, which is a member of the Austrian energy company OMV Group.

According to the State Agency of Oil and Gas, the case refers to the II license block of the Black Sea which starts at the Samegrelo-Zemo Svaneti border. The area of the license block is 5,282 square kilometers. According to the Agency, at the initial stage, OMV Petrom will carry out two-dimensional and three-dimensional seismic exploration works, and in case of finding relevant supplies, drilling works will start.<sup>10</sup> By executing the Contract Georgia joined the countries which carry out exploration and extraction works in the Black Sea. The project, if successful, will significantly contribute to the energy independence of Georgia.

### ***Gas consumption trends and forecasts***

Today, the natural gas sector continues to operate normally, without significant disruptions, although 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 electricity generation and commercial categories where the decrease is observed due to pandemic though it is compensated by the increase in the consumption share of the

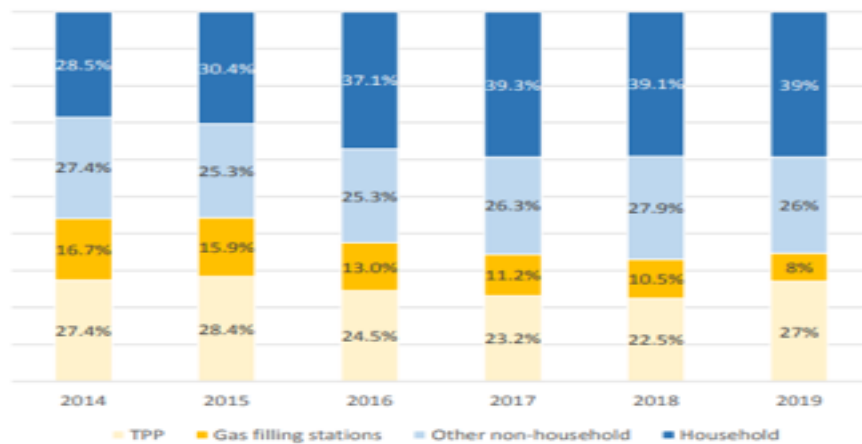
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<sup>10</sup> <https://forbes.ge/news/8862/ra-investigias-ganaxorcielebs-OMV-PETROMi-Sav-zRvaSi-navTobis-ZiebisTvis>

residential sector and total consumption in 2020 does not differ much from 2019. Below is the data provided by the Commercial Department of GGTC:

<b>Consumption of natural gas in Georgia (mc)</b>	<b>2019</b>	<b>2020</b>
Generation of electricity	677.867	614.266
Residential sector	978.919	1123.562
Commercial sector	902.823	811.002
<b>total</b>	<b>2559.609</b>	<b>2548.830</b>

It is notable that as in the rest of the world, the demand for electricity and industry in total is expected to decrease during the crisis and post-crisis periods which will adequately affect natural gas consumption.



**Figure - Natural gas consumption by different sectors (%) in 2019<sup>11</sup>**

Seasonality is an important characteristic of natural gas market in Georgia and it 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.) using gas for heating in winter; ii) Demand from TPP.

<sup>11</sup> source: GNERC

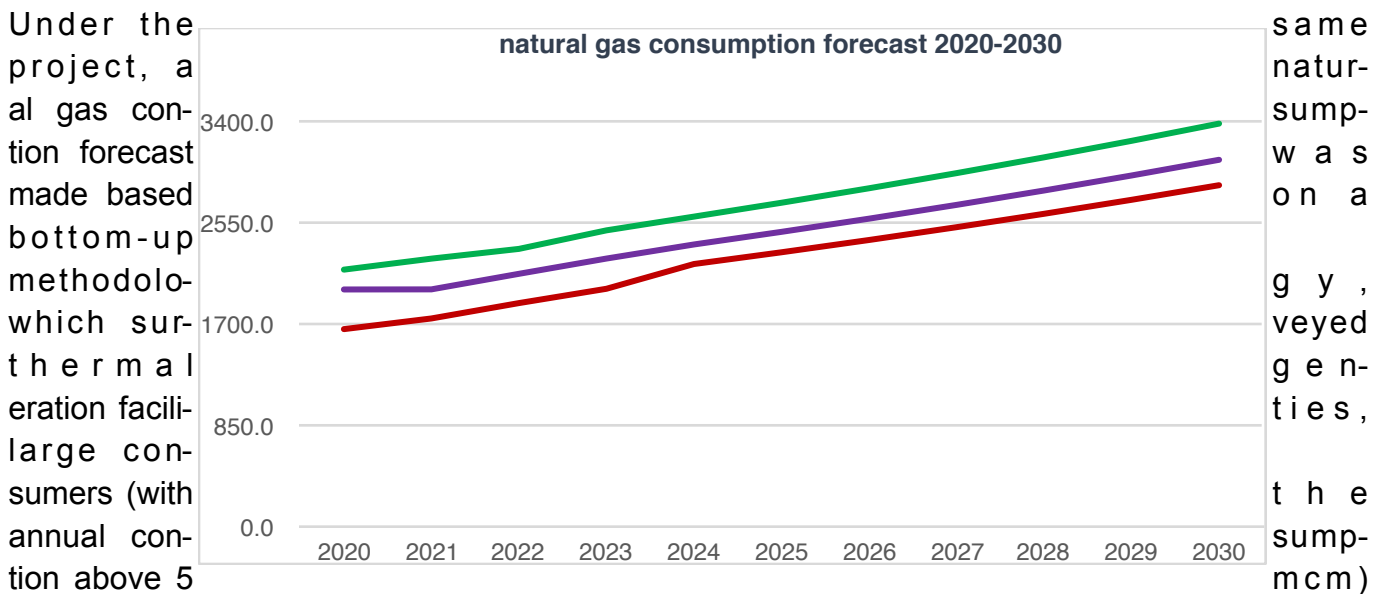
Analysis of statistical data shows that during the period of independence, except for the 2008 military conflict with Russia and the period of economic recovery following the global financial crisis of 2009-2010, gas supply and consumption in Georgia was characterized by an increasing trend.

According to previous forecasts, the growth trend of gas consumption should have been maintained for the next 10-15 years, but in recent months, the spread of Covid infection in the energy sector, as well as in the country's whole economy will leave quite a trace. Since the infection has not been defeated yet, no one knows exactly when the economic recovery will begin, although there are some estimates and assumptions.

For example, the International Monetary Fund forecasts GDP growth in Georgia at the following limits after the 5% decline in GDP in 2020: 2021-5%, 2022 -6%, 2023 -5.8%, 2024-5.5%, 2025-5.2%<sup>12</sup>. Consequently, in this case, the forecast of gas consumption should also keep pace with economic growth, as there is often a close correlation between these two parameters.

As a result of the top-down, regression analysis methodology prepared by the Georgian Gas Transportation Company in cooperation with the Georgian Oil and Gas Corporation as a part of the training on Ten Year Network Development, the consumption forecast calculated for all three scenarios (baseline / optimistic / pessimistic) can be seen below:

**optimistic scenario, baseline scenario, pesimistic scenario (mcm/y)**



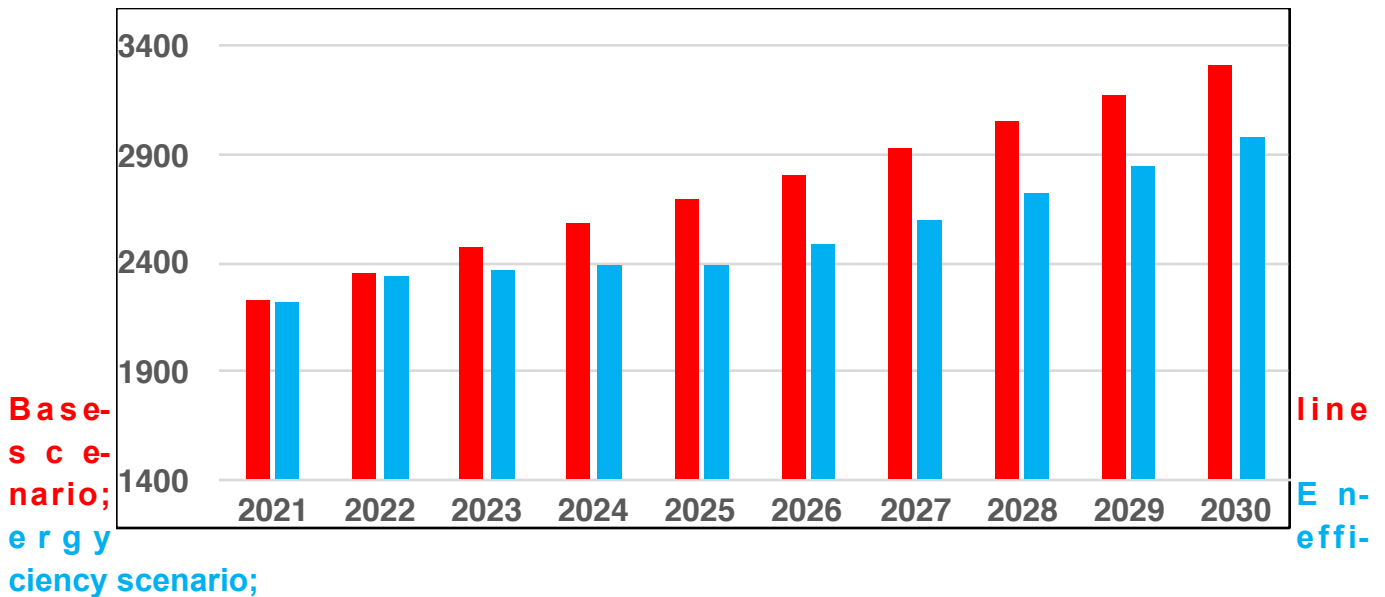
and distribution companies, and the results are as follows:  
 (The figures provided, however, most likely do not explicitly foresee the impact of Covid infection and also the significant reduction in gas consumption as a result of the inclusion of new, highly efficient thermal power generation facilities):

<sup>12</sup> <https://www.imf.org/en/Countries/GEO>



consumers	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Household customers</b>	988	1001,43	1035.03	1061.8	1085.7	1110.07	1134.47	1157.04	1178.9	1396
<b>commercial</b>	799.2	833.01	873.75	912.5	951.38	990.78	1032	1073.94	1119	1165
<b>Thermal generation</b>	1118.4	1036.5	1038.4	1044	1042.5	1044.4	1046.5	1052	1050.4	1052.4
<b>Total</b>	2905.6	2870.94	2947.15	3018.3	3079.58	3145.25	3212.97	3282.98	3348.3	3615.32

An estimated reduction/difference in natural gas consumption, in case the commitments of the National Energy Efficiency Action Plan are fulfilled, is shown in the figure.



### Estimated reduction in gas consumption, mcm/y

The figure above shows the gas demand forecasts taking into account the planned macro-economic development and energy efficiency action plan of the country<sup>13</sup>.

<sup>13</sup> TYNDP of Georgia, 2021-2030, GOGC, November, 2020

## ***The structure 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), the transportation licensee, the distribution Licensees, direct consumers (including thermal power plants) 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), regulation tools of which 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 within the system of the MoESD which issues licenses for the relevant activities.

State-owned Georgian Oil and Gas Corporation (GOGC), as well as Georgian Gas Transportation Company (GGTC) play significant roles in the gas sector. GOGC is the owner of the country's main gas pipeline system. It supplies the optional and supplemental gas received via the South Caucasus Pipeline (SCP) to the regulated segment of the market (household consumers and power generation facilities) through Socar Gas Export-Import. In addition, it supplies small volumes of gas received from Russia and locally produced gas to the competitive segment of the market. 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-Import. 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.

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 directive N2009/73 /EC on market organization, N715/2009/EC on network access and 2004/67/EC on security of natural gas supply.

According to the law, the relevant competent bodies are to develop and approve new by-laws and make changes to the existing legislation within the timeframe set by this law in order to fully implement the above-mentioned objectives. One of important issues is the approval of the new natural gas market concept design by the government expected until the end of the year, unbundling of network activities from the competitive ones, certification and licensing of TSO until the end of 2021 and development of the competitive natural gas market in Georgia in the timeframe to be specified in the Natural Gas Market Concept Design.

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 Georgia <sup>14</sup>**

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)<sup>15</sup>.

<sup>14</sup> Source - GNERC, report for 2019

<sup>15</sup> 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	≤40%
Actual Geo	≈5000	3	≈90%
Actual EU	≈1700	>>3	<40%

**Table - Target indices of the market concentration**

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
<b>Total</b>		<b>2 261</b>	<b>2 344</b>	<b>2 286</b>	<b>2 592</b>

**Table - Natural gas delivery to Georgia by entry points (MCM)<sup>16</sup>**

As assessed by GNERC under the circumstances when the natural gas market at the import level is characterized by high concentration, the development of competition in trading at the wholesale level is impossible without taking special measures. 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 swaps. The relevant projects were submitted by GOGC to the Energy Community Secretariat to obtain PECl/ PMI labels) 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 bio-gas 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.

<sup>16</sup> source: GNERC

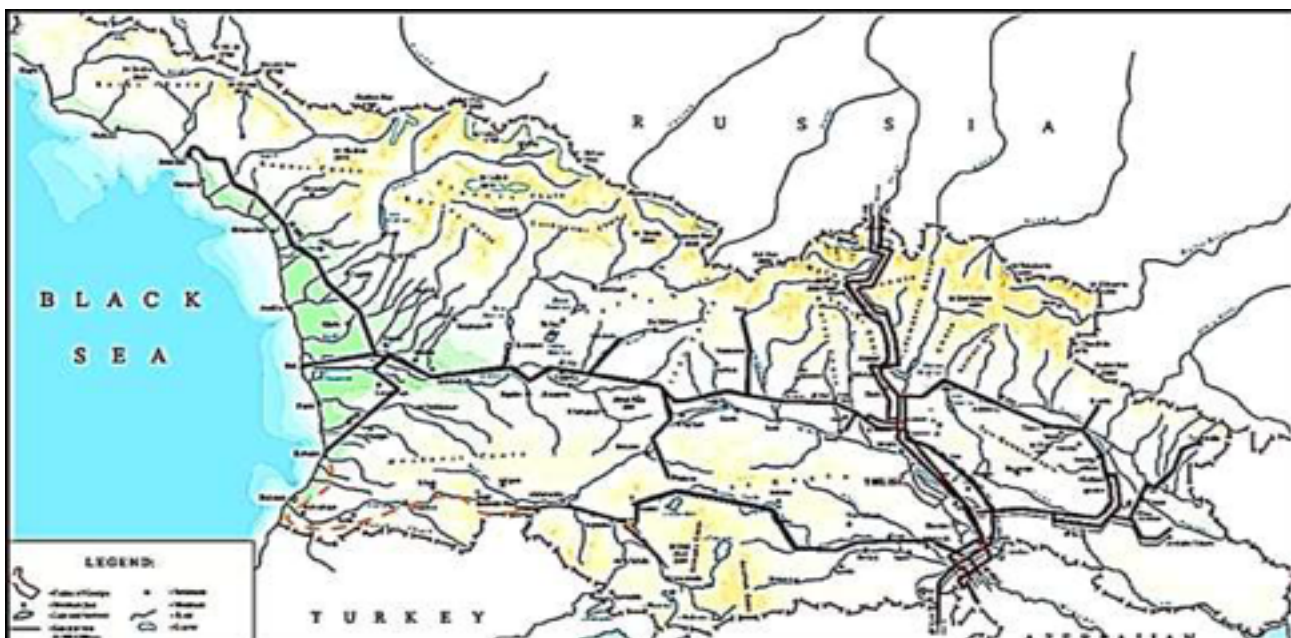
## ***Natural gas system of Georgia and development plan***

Natural gas system 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 discussed above.

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 twenty 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 system:

<b>Pipeline age, Year</b>	<b>length, km</b>	<b>%</b>
> 40	546,106	28,5%
>20-40≤	829,46	43,4%
>10-20≤	200,904	10,5%
≤10	336,58	17,6%
<b>total</b>	<b>1913,05</b>	<b>100%</b>

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.

Due to the expected increase in the prices of imported materials and equipment and the devaluation of the Georgian national currency, the cost of infrastructure project will increase significantly, which will be a prerequisite for reducing the volume of planned projects or starting later

against the background of limited financial resources which of course, will affect the system development and limit its resilience to crisis situation.

Priority short-term investment infrastructure projects include the completion of the East-West main gas pipeline with 700 mm diameter pipes<sup>17</sup> for which the planned rehabilitation-development works are as follows: 18.2 km long section of Natakhtari-Tsilkani-Ksani; 20.6 km long section of Lekhura-Sveneti; Air passage on the river Aragvi; Approximately 70 km long section of Khashuri-Zestaponi. The implementation of these projects will be completed in stages by 2024 at the latest. The implementation of these projects will provide guaranteed gas supply to the population of the western and central regions of the country, the commercial sector and industry envisaging the development prospects of emerging industrial zones and the Black Sea recreational zone.

A table below lists the infrastructure investment projects for the period 2021-2023 with their brief technical characteristics. Part of the medium-term, 2022 and 2023 investment plans are in the stage of detailed or conceptual planning and their investment values are given for information only, as their accuracy may vary within -15 ÷ + 30%.

<b>project title</b>	<b>length, km</b>	<b>D N , mm</b>	<b>c o s t , 1000 GEL</b>	<b>remarks</b>
<b>2021</b>				
Kobuleti branch	18,3	500	2 755	
Natakhtari - Tsilkani -Ksani	18,2	700	6 000	
Airial crossing over the Aragvi in Saguramo	2,9	700	2 900	The cost of the project is estimated on the assumption that the estimated cost of the 1 km long crossing is equal to 1 million GEL.

<sup>17</sup> Source - Ten Year Network Development Plan, 2021 -2030, GOGC, November, 2020

Khashuri -Zestaponi (I phase)	70	700	<u>22 768</u>	In 2021, it is planned to complete the design work, obtain permits and purchase part of the materials (50%). The rest of the material will be purchased and construction work will be completed in 2022 and 2024
Gas Pipeline Remote Monitoring and Control System (SCADA)			5 000	Implementation of SCADA system elements provided taking into account local specifics. The estimated total cost of the project is 7.5 million GEL.
Local restoration (capital) works			2 254	Includes the cost of local rehabilitation and diagnostics, design, grants, easements and other work
total GOGC costs			<b>41 677</b>	<b>financed by GOGC</b>
Local restoration (maintenance) works			<b>9000</b>	<b>financed by GOGC</b> ( to be adjusted every year)
<b>year 2022</b>				
Khashuri - Zestaponi (II phase)		700	40 618	In 2022 it is planned to carry out construction works on a section of approximately 23.3 km and purchase the remaining (50%) materials.
Aspindza - kotelia	23	300	3 668	Rehabilitation of the section with existing, non-compliant technical parameters is envisaged
Iekhura - Sveneti	20,6	700	6600	
SCADA			3 500	<b>The project is scheduled to be completed in 2022.</b>
Local restoration (capital) works			2 254	
GOGC costs - total			<b>56 640</b>	<b>financed by GOGC</b>



Local restoration (maintenance) works		<b>9000</b>	<b>financed by GGTC</b>	
<b>year 2023</b>				
Khashuri - Zestaponi (III phase)	23,3	700	17 850	In the 3rd stage, construction works will be carried out on an approximately 23 km lon section.
Akhaltsikhe -Ude	16	300	6 002	It is planned to replace the existing 200 mm pipeline by a 300 mm, increased throughput main pipeline
Local restoration (capital) works			2 254	17 850 In the 3rd phase, construction works will be carried out on a section of approximately 23.3 km.
GOGC costs, total			<b>26 106</b>	<b>financed by GOGC</b>
<b>total cost from GOGC budget, 2021-2023 years;</b>			<b>124 423</b>	<b>financed by GOGC</b>
Local restoration (maintenance) works			<b>9 000</b>	<b>financed by GGTC</b>
<b>GGTC costs, total 2021-2023</b>			<b>27 000</b>	<b>financed by GGTC</b>

### Specific parameters required in the main gas pipeline system of Georgia for its smooth operation

The Georgian gas transportation system operates at the pressure range of 9-25 bar, where specific sections require the maintenance of appropriate technical parameters for the smooth and reliable operation of the system. Important sections in this regard are:

1. Air turbine thermal power plants in the Gardabani region, for the proper operation of which the pressure in the pipeline system must be at least 14 bar.
2. In order to maintain the working pressure towards the west (Adjara), the natural gas pressure in the pipeline system should be at least 17 bar.

3. In order to supply gas to Adjara region with proper parameters, a pressure of at least 8.5-9 bar is required in the pipeline system locally.

Accordingly, in the case of deterioration of the mentioned parameters balancing actions are taken in order to maintain the smooth operation of the gas supply system of the mentioned sections and the technical characteristics<sup>18</sup>.

### ***Protected Customers in Georgia***

According to Article 4. 4 of the Natural Gas Market Rules (to be replaced in 2021 by the new market rules) in force in Georgia, in the event of a crisis, supply should be maintained primarily to thermal power plants that generate electricity through natural gas. In practice, reportedly the state also takes care of the household customers and tries to prioritize them over other groups during supply shortages.

However, under the Law of Georgia on Energy and Water Supply adopted in December 2019, 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”.

This definition is close but not identical to the definition in Regulation (EU) 2017/1938. Notably, Regulation (EU) 2017/1938 establishes a limit – small or medium-sized enterprises and essential social services which are protected customers, should not represent more than 20% of the total annual final gas consumption – which is missing from the Georgian legislation. Also, for Georgia only small enterprises enjoy the protection from the Government during crises where the medium sized enterprises are beyond such protection zone;

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 transposing 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.

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<sup>18</sup> Source: GGTC, Dispatch Center

It should be noted that the provisions on security of supply in the field of natural gas will enter into force from September 30, 2021 according to the deadline specified in the Law on Energy and Water Supply. Accordingly, a detailed definition of this subcategories have not been made yet, although some preconditions and presumptions may already be emphasized.

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.

According to GNERC data of 2019, household consumption accounted for 39% in the total consumption, which is 1.014 bcm. As underlined above, pursuant to the EU Regulation 2017/1938, small and essential social services should not be more than 20% of the total consumption at the same time. Based on 2019 data, Georgia's total consumption amounted to around 2.6 billion cubic meters of gas. However, according to the EU standard, total consumption means only primary consumption of gas and does not imply its transformation. Accordingly, if we subtract the total consumption of thermal generation, then the 20% limit is about 380 mcm based on data from the same year.

Based on the information obtained by the Georgian Gas Transportation Company via questionnaires (sepcifically developed for the purposes of this SoS statement) from distribution licensees, which assumed that small enterprises consumed less than 100,000 mcm annually<sup>19</sup> and essential social services represented the ones already reflected in stress test of 2014<sup>20</sup>, the total consumption of these additional protected customers in 2019 accounted for about 204 million (8%). This shows that by using the current definition in the Law on Energy and Water Supply and by using the assumed quantities, the 20% requirement of Regulation (EU) 2017/1938 is fulfilled.

Thus, the consumption of protected consumers where households reached 1,014 bln (39%) in 2019 and plus small enterprises and essential social services – 204 mln is about 1.218 billion and equals to 46-47% of the total consumption (including thermal generation). By this logic, we can assume that almost half of the consumers may fall into the category of Protected Customers.

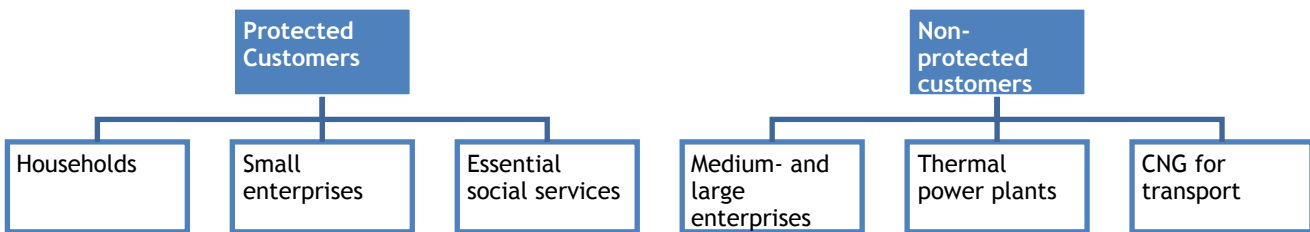
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<sup>19</sup> Serbia has such a definition of small enterprises, where the size of the gas segment is about the same as in Georgia

<sup>20</sup> In this regard, it should be highlighted that some assumptions have already been made by the Ministry of Energy of Georgia in the stress test related to the disruption of natural gas supply from Russia in 2014, and it can be used as a basis. The potential essential social services provided there are: **Governmental authorities; Utilities of the Ministry of Defense; Utilities of the Ministry of Internal affairs; penitential system; Healthcare system; Kindergartens and schools; Bread factories; Railway; Airports; Ports; Water pumps, Telecommunication facilities;**

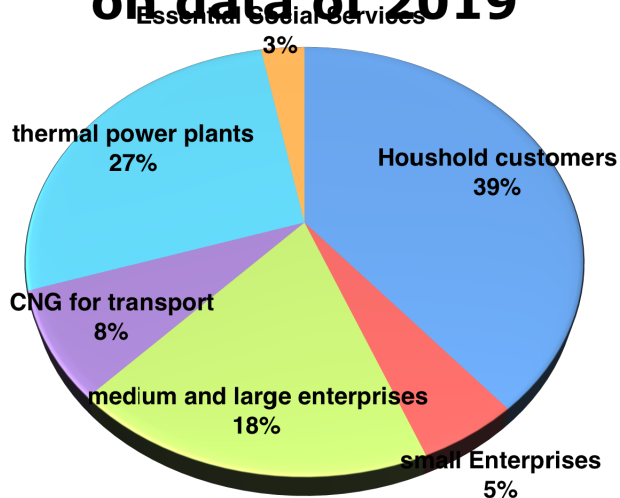
However, there is some potential (but it will not change the picture significantly) for a reduction in small enterprises and essential social services which depends on how the state determines the parameters of small enterprises and also, what institutions/services it attributes to the category of essential social services. In this regard, despite having some basis already formulated in the stress test of 2014, there are new circumstances worth taking into account. Some services may no longer be relevant, for example, educational system where distance learning systems have already been introduced widely amid the spread of the pandemic, also restrictions in airport and railway areas have already been established as a common practice worldwide.

Due to the fact that a special questionnaire sent by the GGTC to the gas distribution companies revealed the possibility of disconnecting the protected customers selectevely from other customers which was not the case in 2014 when enquired by the Ministry of Energy for the same purposes, therefore, at this stage, gas consumption in Georgia for security of supply analysis can be broken down into the following categories:



The picture below shows the annual consumption shares of different consumer categories as a result of the GGTC’s survey based on 2019 data.

## Protected and Non Protected Customers' yearly consumption based on data of 2019



- Household customers    ● small Enterprises    ● medium and large enterprises
- CNG for transport    ● thermal power plants    ● Essential Social Services

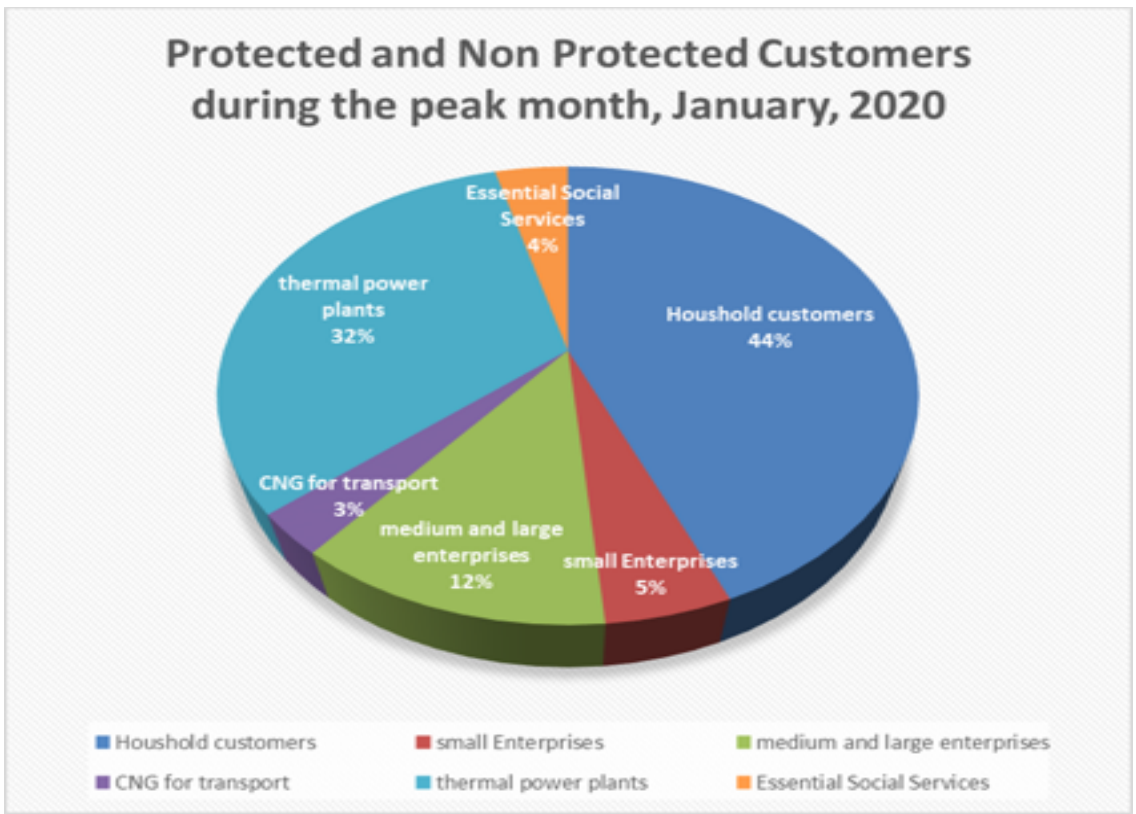
The table below also shows the shares in consumption between the same categories for the peak month, January 2020:

**Total amount of consumption – 427.8mcm<sup>21</sup>**

Categories	Distribution area mcm	Transmission Area mcm	Total mcm
<b>Thermal power plants</b>		137.9 (32.2%)	137.9 (32.2%)
<b>Household customers</b>	187 - (43.7%)		187 (43.7%)
<b>Autogas stations</b>	0.6 - (0.14%)	11.9 (2.8%)	12.5 (2.94%)

<sup>21</sup> Source: GGTC, Commercial Department as well as main Gas distribution companies

<b>Medium and large enterprises</b>	14.3 (3.3%)	37.9 (8.8%)	52.2 (12.2%)
<b>Small enterprises</b>	20.7 (4.74%)	0.2 (0,16%)	20.9 (4.9%)
<b>Essential Social Services</b>	17.3 (4.06%)		17.3 (4.06%)
<b>Total:</b>	<b>239,9</b>	<b>187.9</b>	<b>427.8</b>



**Supply standards**

In general, with regard to 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 30 September 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 few years and some gasification work is 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. In this regard, it should be noted that global warming trends should be taken into account. Studies on climate change in Georgia have shown that temperatures have risen in Georgia over the last 20-25 years<sup>22</sup>.

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 2008<sup>23</sup> 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 °C .<sup>24</sup>

It should also be noted that there is a degree day<sup>25</sup> definition, which is a measure of the severity and duration of cold weather, 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

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<sup>22</sup> <https://www.kvirispalitra.ge/public/30250-qklimatis-cvlilebis-scenari-arasakharbieloaq.html>

<sup>23</sup> <https://www.allnews.ge/%E1%83%A1%E1%83%90%E1%83%98%E1%83%9C%E1%83%A2%E1%83%94%E1%83%A0%E1%83%94%E1%83%A1%E1%83%9D/150897-%E1%83%A1%E1%83%90%E1%83%A5%E1%83%90%E1%83%A0%E1%83%97%E1%83%95%E1%83%94%E1%83%9A%E1%83%9D%E1%83%A8%E1%83%98-%E1%83%A1%E1%83%AE%E1%83%95%E1%83%90-%E1%83%9E%E1%83%94%E1%83%A0%E1%83%98%E1%83%9D%E1%83%93%E1%83%A8%E1%83%98-%E1%83%93%E1%83%90%E1%83%A4%E1%83%98%E1%83%A5%E1%83%A1%E1%83%98%E1%83%A0%E1%83%94%E1%83%91%E1%83%A3%E1%83%9A%E1%83%98-%E1%83%90%E1%83%9C%E1%83%9D%E1%83%9B%E1%83%90%E1%83%9A%E1%83%98%E1%83%A3%E1%83%A0%E1%83%98-%E1%83%A2%E1%83%94%E1%83%9B%E1%83%9E%E1%83%94%E1%83%A0%E1%83%90%E1%83%A2%E1%83%A3%E1%83%A0%E1%83%90.html>

<sup>24</sup> <https://radiomosaic.ge/index.php/2018-07-05-18-48-33/3529-2018-12-25-08-31-21>

<sup>25</sup> It shows the difference between the outside temperature and the baseline temperature. The base temperature is the equilibrium temperature, the minimum ambient temperature under which there is no need to heat the building. If the daytime temperature is below baseline, heating is needed on such a day and the difference between the temperatures is exactly a degree day of that day.



°C below which consumption increases intensively in proportion to the decrease in temperature<sup>26</sup>.

At this stage, for the purposes of security of supply analysis, the highest rate of gas consumption is relevant, which was recorded on January 20, 2020, namely, consumption on this day reached 15.4 mcm, where the share of the residential sector was quite large and amounted to 7 mcm. As for the peak week, according to the GGTC data, the peak consumption days were in a week of January 20-27, when Georgia consumed a total of 104 mcm. Also, the peak month is January 2020 and the total consumption during this period was 427 mcm which is significantly higher than in previous years.

The last four winter seasons<sup>27</sup>

	<b>2016 -2017</b> mcm	<b>2017-2018</b> mcm	<b>2018 – 2019</b> mcm	<b>2019-2020</b> mcm
<b>Peak day demand</b>	13,8 December	13,4 February	13 December	15, 4 January
<b>Peak week demand</b>	95 December, IV week	80 January, IV week	86,4 February, III week	104 20-27 Jan- uary
<b>Peak month demand</b>	395, 8 December	336,3 December	361,4 January	427 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

<sup>26</sup> Source: GGTC

<sup>27</sup> (winter season includes three months - December-January-February)

consumers in Georgia. However, given the economic recovery envisaged and increase in consumption in the future, without taking additional 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;

The general picture of gas supply curtailments can be possibly 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 m<sup>3</sup>/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.
- Also according to Mina Ltd., 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 Rustavi Foladi, their equipment can be switched off 10 hours in advance without any technical damage, and the minimum gas supply level is 1500 m<sup>3</sup>/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.

### **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;
- e) 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.

### ***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;
- 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.

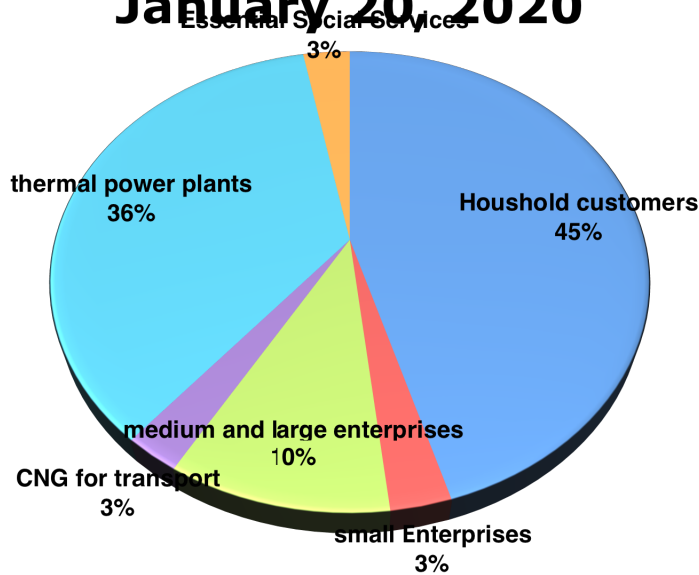
Before considering specific scenarios, we should first focus on the example of peak demand day observed on January 20, 2020 in the gas consumption scheme:

### **Consumption on a peak day – 20 January (2020)**

#### **Peak day Consumption per categories**

<b>Categories</b>	<b>Distribution area mcm</b>	<b>Transmission area mcm</b>	<b>Total mcm</b>
<b>Thermal power plants</b>		5.6 (36%)	5.6 (36%)
<b>Household customers</b>	7 (45.4%)		7 (45.4%)
<b>Autogas stations</b>	0.015 (0.1% )	0.3 (2.5%)	0.4 (2.6%)
<b>Medium and large</b>	0.4 (2.4%)	1.1 (7.7%)	1.5 (10%)
<b>Small enterprises</b>	0.4 (2.77%)	0.004 (0.03%)	0.4 (2.8%)
<b>Essential social services</b>	0.5 (3%)		0.5 (3 %)
<b>Total</b>	8.3	7.1	15.4

## Protected and Non Protected Customers during the peak day, January 20, 2020



- Household customers
- small Enterprises
- medium and large enterprises
- CNG for transport
- thermal power plants
- Essential Social Services

The table and chart above shows that on this particular day, the households, small enterprises and essential social services consumed **7.9 mcm (51.2%)**, while the consumption of thermal generation, gas transport stations and medium and large enterprises consumed about **7.57 mcm (48.8%)**. Based on these data, we can assume that the share of protected customers in the total peak day consumption is quite high, however, in order to determine their accuracy, it will be necessary for the government to define parameters of small enterprises as well as the list of essential social services in near future, as mentioned above, and then to observe their consumption patterns during the peak periods.

### 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<sup>28</sup>:

<sup>28</sup> Source: GNERC report of 2019



As outlined above, natural gas to Georgia is supplied by Azerbaijan State Oil Company SOCAR, the South Caucasus Pipeline Consortium and Gazprom Export. Taking into account the technical aspects and within the framework of the concluded agreements<sup>29</sup>, the maximum contractual volume of gas available to Georgia, taking into account the above-mentioned sources, is 16.3 mcm per day, which is hardly above the peak day demand. In extreme situation, if Armenia allocates to Georgia some of their portion from transit gas and if in addition Russia increases pressure on the cross border infrastructure, Georgia may receive more than this amount.

### Technical and contractual parameters of cross-border gas infrastructure

Entry points	Throughput capacity, mcm/d	Contractual volumes mcm/d
<b>North South Pipeline (Russian border)</b>	4.2; (≈8)	200 per year. There is no daily limit. (4.2)

<sup>29</sup> The supplemental gas contract ensuring annually 500mcm from Shah-deniz field at preferential price expires in 2026, thus Georgia will have to seek gas volumes to replace this share and also additional volumes to meet the increasing demand after the recovery of the economy.

<b>Kazakhi-Saguramo (Azerbaijani border)</b>	8	8.0 (from this volume Georgia gets 1.1 from the South Caucasus Pipeline)
<b>South Caucasus Pipeline (Gardabani, entry point for receiving Shah Deniz gas)</b>	5.4	4.1 (supplemental gas-2, optional gas-2.1)
<b>Reverse flow from Armenia</b>	3.1 ( $\approx 2$ )	
<b>Total</b>	17.6; ( $\approx 23.4$ )	(16.3)

## Scenarios regarding the disconnections of Entry points

### Kazakhi-Saguramo pipeline disconnection

In this case, the daily gas deficit will be 8 mcm. If certain conditions are met, such as Armenia's consent to allocate its share of gas to Georgia at the expense of their underground gas storage and increase pressure on the Georgian-Russian interconnection, there could be no limitation and no need to activate emergency level. However, the duration of the crisis and availability of these conditions should be taken into account. Otherwise Georgia may encounter supply problems and may need some supply restrictions to non protected customers.

### South Caucasus Pipeline Disconnection

In this case, the gas deficit during the peak day will be 5.4 mcm. It will be technically possible to mobilize enough gas just as discussed above involving Armenia. If sufficient gas cannot be mobilized, it will be necessary to limit gas supply to generation facilities and import electricity and/or cutting off supply to gas stations and other non protected customers which should be done via declaring a state of emergency.

### North-South pipeline outage

In this case, the gas deficit will be at least 4.2 mcm. In this scenario, it will be technically possible to mobilize 13.4 mcm natural gas through other two interconnectors, which could be sufficient for consumers it is does not happen during the peak demand week. If consumption will be extremely high, the supply may be restricted partly to thermal power plants in the hope to import the lacking amounts from neighbouring countries. Thus, the import of electricity will probably be necessary as well as the shutdown of CNG stations depending on the situation.



### **Disconnection of Kazakh-Saguramo and South Caucasus pipelines**

In this case, it will be necessary to maximize the gas flows from Russia. If the consumption in Armenia is not high or it grants its share of transit gas to Georgia, it will be possible to mobilize around 8 mcm/d from the Saguramo node. Technically Georgia can receive additionally around 2 mcm via a reverse flow from Armenia, however politically this is rather unlikely. In any case, Russian gas will probably be enough to supply protected consumers if the endowment of gas volumes is agreed with Armenia<sup>30</sup> or there is low level of consumption (app.8 mcm/d as was for example, in February, 2017).

### **Disconnection of the North-South and South-Caucasus pipelines**

In this case, only 8 mcm could be received from the Kazakh-Saguramo pipeline which would be enough to supply Protected Customers. Thus, gas supply to medium and large enterprises, as well as to generation facilities and transport would need to be cut off.

### **Disconnection of North-South and Kazakh-Saguramo pipelines**

In such a scenario, the country would be able to receive only 5.4 mcm gas daily. The linepack can provide some relief to the country in the short term, but prolonging this situation is likely to further limit gas supplies to the population in regions where there are more opportunities to switch to firewood. In this case, the demand for electricity is expected to increase significantly triggering maximum electricity imports. Gas supplies may also be limited to small businesses, consequently not all protected customers could be served.

### **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 pres-

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<sup>30</sup> Armenia can receive a maximum of 6 mcm natural gas per day from the Abovyan gas storage, while the country's peak consumption exceeds 13 mcm/d. The total volume of the gas storage is 135 mcm. If an agreement is reached, Armenia can temporarily withdraw a maximum of 6 mcm/d which could last for 22.5 days. As for the alternative source from Iran to Armenia, it is notable that during peak winter consumption, Iran is known to be failing to meet its export obligations to Turkey. Moreover, at this time Iran is importing gas from Turkmenistan to meet its own demand. So the option of getting extra gas from Iran during the winter is practically unrealistic leaving Armenia dependent on transit volumes from Georgia and its gas storage.

sure 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.

Year -2020;

where:

The calculated area is the territory controlled by Georgia;

The sum of maximum technical capacities is 17.6 mcm/d;

The average daily production is -0.025 mcm;

Kazakh Saguramo (8 mcm/d) is considered to be a large infrastructure;

Peak consumption day 15.4 mcm/d, recorded on January 20, 2020.

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:

Year -2020;

where:

The calculated area is the territory controlled by Georgia; The sum of maximum technical entry capacity of pipelines is 21.4 mcm/d;

The average daily production is -0.025 mcm/d;

Kazakh Saguramo (8 mcm/d) is considered to be the single largest infrastructure;

Peak daily consumption is 15.4 mcm recorded on 20 January 2020.

Since the result in the formula should be equal to or greater than 100, it can be concluded that Georgia does not meet the infrastructure standard in this case. In addition, this case largely depends on the political will of Armenia to allocate its volumes for which there is no agreement in place until now. Consequently, as this situation is politically challenged the necessity of the underground Gas Storage within the country is critically important.

## Case of a gas storage

For visibility purposes, the cases of the construction of the gas storage are considered below while calculating Infrastructure standard. In this particular situation, transit gas flows to Armenia is not hampered:

Year – 2024;

where:

The calculated area is the controlled area of Georgia;

The sum of maximum technical capacities is 17.6 mcm/d ;

The average daily production is -0.025 mcm (unchanged).

Daily maximum of the gas storage - 6 mcm/d;

Kazakh Saguramo (8 mcm/d) is considered to be the largest infrastructure and

The peak consumption day means 15.06 mcm/d<sup>31</sup> (*which is provided from the recent TYNDP envisaging the economic outcomes of COVID infection*).

It should be noted that the infrastructure standard in this case is 103%, however, if large infrastructure is disconnected for more than 1 day, this percentage will further deteriorate, since this amount of gas withdrawal (6mln) from the gas storage is possible only during one day in emergency mode. 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 will result in supply shortage anyway if Armenia will not allocate some part of its own portion of transit gas.

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.

Thus, we can conclude that the parameter of the infrastructure standard may change depending on the specific circumstances and the construction of the Undergournd Gas Storage and the prior agreement with Armenia are critical.

## Crisis management in terms of legal aspects

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<sup>31</sup> TYNDP of Georgia, 2021-2030, GOGC, November, 2020

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 also 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;
- For each crisis level, the tasks and responsibilities of the Ministry 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 enters 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 Ministry plans to apply it in drawing up the emergency management plan in accordance with the new commitments.

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)<sup>32</sup> 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 (MoESD). It should be noted that after being notified of an emergency, the Ministry ensures the official visit of an authorized person to the Inter-agency Operational Center<sup>33</sup>. Based on the decision of this center, the Ministry starts implementing 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 Ministry<sup>34</sup>;
- ✓ 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;

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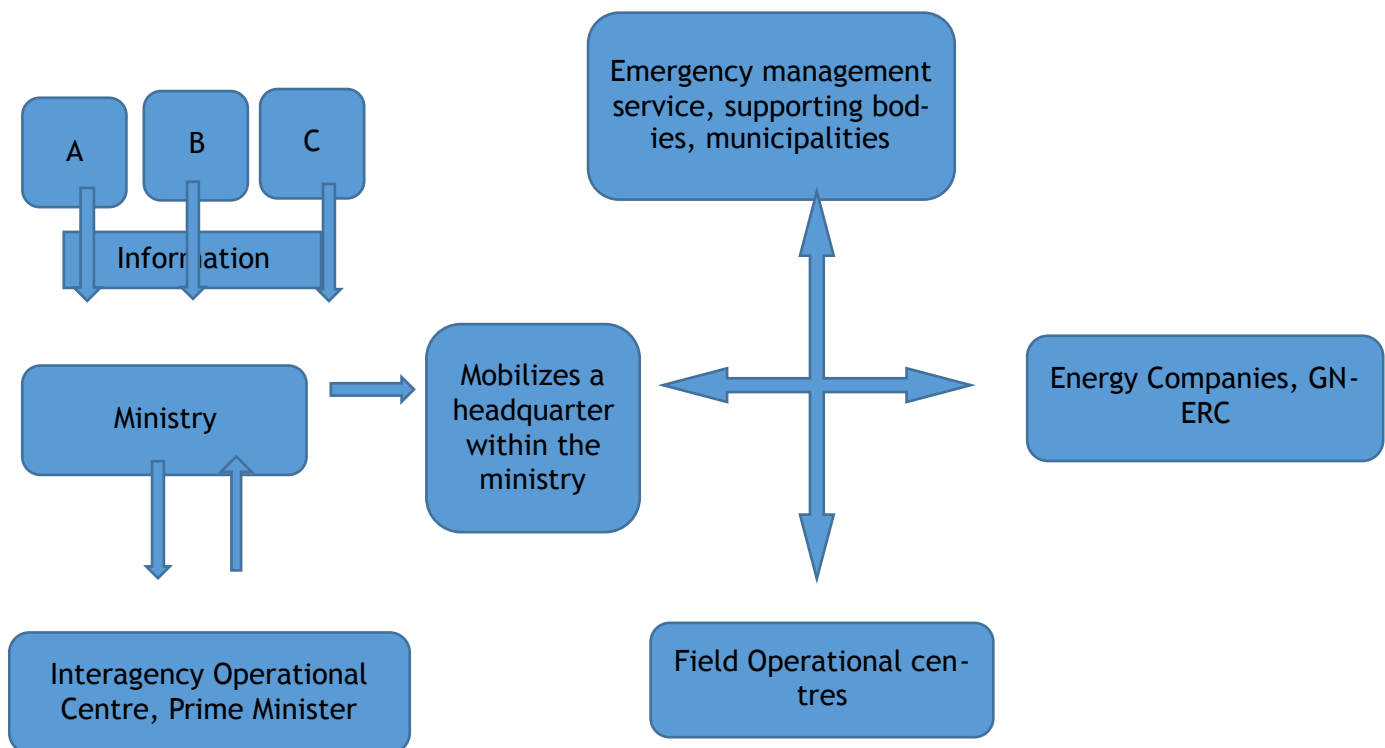
<sup>32</sup> Based on the law of Georgia on Civil Security, the National Civil Security Plan was approved under the Resolution of the Government N508 in 2015 in order to ensure the coordination of the unified emergency management system in the country, all branches of the executive power and municipal bodies. The National Civil Security Plan is the main guiding document in the national system, which regulates administrative and sectoral activities in the field of civil security. The national plan defines: the rules for emergency prevention, preparedness, response and restoration works which is provided by the implementation of 17 emergency assistance functions. Each emergency assistance function is coordinated by the relevant ministry, its structural unit or a legal entity of public law within the system of that ministry with the participation of supporting agencies and organizations as well as municipalities and administrations of the State Representative-Governor in the respective municipalities.

<sup>33</sup> A body created and governed by the Prime Minister and consisting of authorized persons from governmental institutions of unified system to organize and coordinate response to expected or actual emergencies at the operational level (law of Georgia on Civil Security);

<sup>34</sup> This plan has to be developed by the competent ministry in accordance with Government Resolution 452 of October 6, 2017 (Rules for Preparing an Emergency Management Plan), which is required to be agreed with the Emergency Management Service.

- 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;
- 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:**



It should also be noted that the relations between the Ministry and the energy companies will be regulated in detail in the Security of Supply Rules for Natural Gas, which will enter into force in September 2021. Based on the latter, the roles and competencies of energy enterprises will be defined and in future their individual response plans will be accordingly adapted, which will also be in line with the Natural Gas Emergency Management Plan to be prepared by the MoESD taking into consideration new commitments.

Importantly, there are other types of important documents related to the security of the country in general which also cover energy security from different angles. For example, on the basis of the Law of Georgia on National Security Planning and Coordination a threat assessment document was developed under the governance of the National Security Council apparatus in cooperation with various agencies which among other areas of national security identifies energy threats, risks and challenges, identifies them and includes risk forecasting and appropriate 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 levels.

As for regional cooperation, certain practices and cooperation have been established with neighboring states. Georgia has a long-term strategic partnership with Azerbaijan. For example, during the crisis caused by the disruption of Russian gas supply in 2006, Azerbaijan helped supply gas to Georgia and, as a sign of solidarity, even restricted certain types of customers domestically in favor of Georgian consumers.

However, the mechanisms of cooperation which the legislation of the European Union and the Energy Community envisage, can not be applied to neighboring countries in a binding manner. Nevertheless, in both electricity and gas, Georgia will endeavour 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 also be noted 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 energy security it 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, exploring 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.*

**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) No 994/2010*

*Law of Georgia on National Security Planning and Coordination*

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*Law of Georgia on Civil Security*

*National Civil Security Plan*

*GNERC 2019 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*

*Information received from distribution companies via questionnaire*