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**HYDRO POWER AND ENERGY  
PLANNING PROJECT (HPEP)**

# **ANALYSIS OF NATURAL GAS SECTOR AND ITS IMPACT ON THE ELECTRICITY MARKET OF GEORGIA**

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DELOITTE CONSULTING LLP

USAID/CAUCASUS OFFICE OF ENERGY AND  
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**This document was prepared by:**

<b>Author</b>	<b>Organization</b>	<b>Contact Details</b>
Sopio Khujadze	Deloitte Consulting	<a href="mailto:skhujadze@dcop-hpep.ge">skhujadze@dcop-hpep.ge</a>
Ruben Abrahamyan	Deloitte Consulting	<a href="mailto:abrrub@gmail.com">abrrub@gmail.com</a>
<b>Reviewer</b>	<b>Organization</b>	<b>Contact Details</b>
Jake Delphia	Deloitte Consulting	<a href="mailto:jdelphia@deloitte.com">jdelphia@deloitte.com</a>
Zviadi Gachechiladze	Deloitte Consulting	<a href="mailto:zgachechiladze@dcop-hpep.ge">zgachechiladze@dcop-hpep.ge</a>

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## 1.0 ACRONYMS USED IN THIS REPORT

AGSC	Azerbaijan Gas Supply Company
BBL	Barrel of Oil
BTC	Baku-Tbilisi-Ceyhan Pipeline
CCGT	Combined Cycle Gas Turbine
ESCO	Electricity System Commercial Operator
EWGP	East-West Gas Pipeline
GDP	Gross Domestic Product
GGTC	Georgia Gas Transportation Company
GIOC	Georgian International Oil Corporation
GNERC	Georgia National Energy and Water Supply Regulatory Commission
GOGC	Georgia Oil and Gas Corporation
HPEP	Hydro Power and Energy Planning
HPP	Hydropower Plant
JSC	Joint Stock Company
MGPS	Main Gas Pipeline System, from Russia to Armenia
MMCF	Million Cubic Feet
MMCM	Million Cubic meters
NGFEVP	Natural Gas For Every Village Project
NOC	National Oil Company
NSGP	North-South Gas Pipeline, a branch of the MGPS
NSMP	North-South Main Gas Pipeline
O&M	Operations and Maintenance
PSA	Production Sharing Agreement
SCP	South Caucasus Pipeline
SOCAR	State Oil Company of Azerbaijan Republic
TPA	Third Party Access
TPP	Thermal Power Plant
USAID	United States Agency for International Development
WREP	Western Route Export Pipeline

## 2.0 INTRODUCTION

USAID Hydro Power Energy Planning Project (HPEP) is tasked with supporting the Georgia Ministry of Energy in developing the country's national energy policy and strategy. USAID HIPP, the predecessor to USAID HPEP, analyzed the electricity sector of Georgia and sectors in the regional markets. It is evident from that analysis that there is a strong relationship between the activities and prices in the natural gas sector of Georgia and the region and the electricity sector of Georgia. This report analyzes those relationships and their implications on investment into new hydropower plants (HPPs.)

### 3.0 BACKGROUND

The specific reasons for the review and analysis of the natural gas sector in the HPEP project is for the following circumstances:

- Analysis of the impact of new Georgian natural gas-fired power plants on the interest of investors in hydropower in Georgia, taking into account the growth of the domestic consumption, especially in winter, and export energy potential to Turkey;
- Plans for construction of Thermal Power Plants (TPPs) in Georgia to ensure the proper flexibility of the Georgian power system, considering that most of the new HPPs are run-of-river, not dispatchable and output can vary from hour to hour according to river flows.
- The electricity market price in Georgia (normally the cost of the highest priced generating unit operating) is driven by natural gas-fired generation in the non-summer months. The price offered by electricity off-takers including ESCO is therefore directly related to the price of natural gas-fired electricity production.

This report includes:

- Organizational structure of the Georgian natural gas sector;
- Legal framework of natural gas sector;
- Physical structure of the natural gas sector;
- Local natural gas production; and,
- New natural gas-fired generating units and their impact on investments in hydropower sector of Georgia.

Georgia does not have significant oil and gas reserves<sup>1</sup>. Georgia imports 99.7% of its domestic requirements of natural gas according to the 2012 balance (see Annex 1), from which Georgia covers 60-70% of domestic natural gas demand through the gas provided by transit agreements while the rest is also imported. As a result, about 65% of country's primary energy supply is from external sources. Imported natural gas constitutes about 45% of total energy supply while imported oil products constitute about 25% of energy mix. Georgia's hydropower electricity production constitutes 20-25% of total energy supply and, for the most part, the rest of the energy requirements come from fuel wood<sup>2</sup>. Because of the import dependence and the relatively high energy intensity of its GDP, the competitiveness of Georgia's economy can be significantly impacted by increases of imported energy prices.

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<sup>1</sup> As of January 01, 2013 Ninotsminda gas reserves are 122.6 mln m<sup>3</sup>

<sup>2</sup> [http://weg.ge/wp-content/uploads/2012/12/energy\\_security\\_georgia\\_perspective.pdf](http://weg.ge/wp-content/uploads/2012/12/energy_security_georgia_perspective.pdf)

Although Georgia has no proven large-scale oil and natural gas resources or production, it can generate revenues from oil and natural gas transit due to its geo-strategic location. Despite its lucrative location, Georgia continues to struggle to obtain a satisfactory level of energy security.

## **4.0 NATURAL GAS SECTOR**

### **4.1 GAS MARKET STRUCTURE**

Within the Georgian **natural gas transmission sector**, the main entity is the state-owned Georgian Oil and Gas Corporation (GOGC), established as a limited liability company in 2006. It was named as an exclusive operator, owner, user, disposer, and manager for natural and liquid gas imports to Georgia. In year 2012, GOGC became a joint stock company (JSC) under ownership of Georgian Partnership Fund.

GOGC is responsible with Georgian Gas Transportation Company (GGTC) for the transit of natural and liquid gas within and throughout the territory of the country, and as the providers of the necessary measures for the development of the systems of natural and liquid gas supply to the State.

Georgia's natural gas supply is provided by GOGC and SOCAR through the East-West Gas Pipeline (EWGP.) There are various market participants in the supply and distribution of natural gas to competitive end-consumers in Georgia.

In the natural gas distribution sector, there are 64 distribution companies, (the privatized distribution company, KazTransGaz Tbilisi, owned by the Kazakhstani Company and regional gas companies mostly owned by ITERA<sup>3</sup> and Socar Gas Georgia) and the management of these distribution companies is carried out mostly by municipal authorities. No license is necessary in Georgia for retail suppliers, and they are not subject to registration. Third party access (TPA) to the gas network is allowed and access is negotiated.

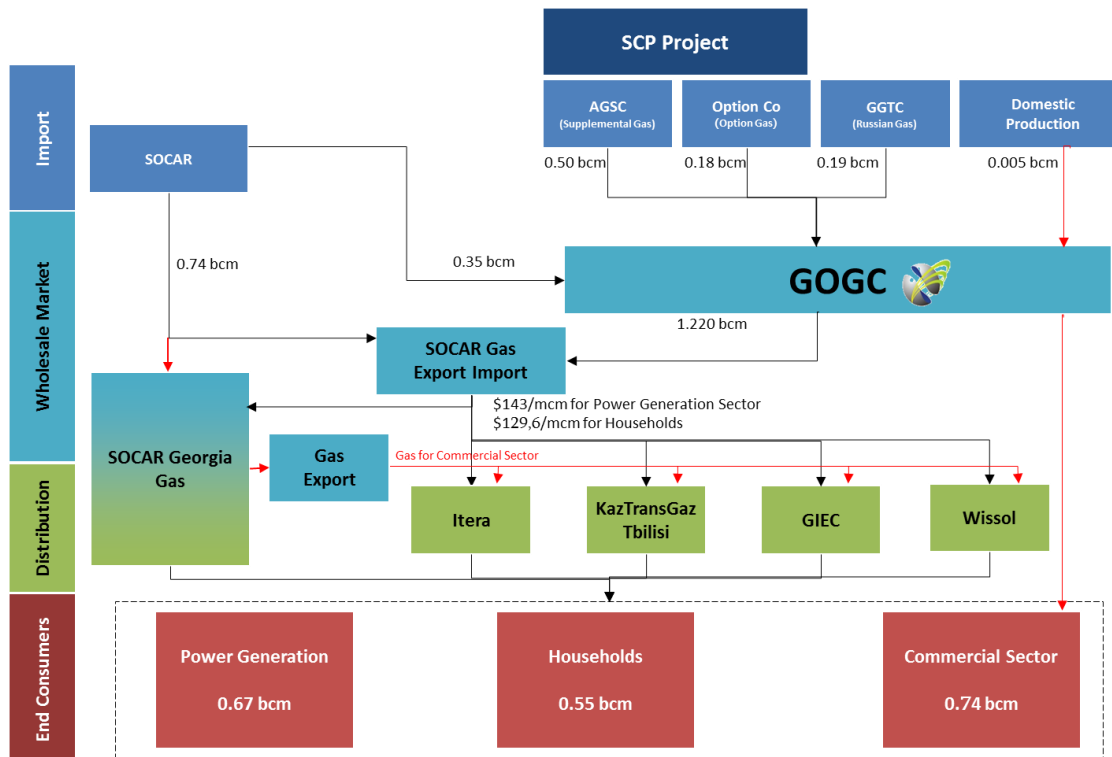
The following diagram sets forth the participants in, and the structure of, the Georgian gas distribution and supply market:

### **Figure 3.1 Structure of Georgian Gas Market**

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<sup>3</sup> In November 2012 SOCAR acquired the company "Itera-Georgia", 100% the "daughter" of Russian ITERA International Energy LLC. However, after that, the company did not change the name. Natural Gas Balance 2013 of Georgia, approved by an Order N3 of Ministry of Energy of Georgia, approves the fact that Itera still participates in the market.





The downstream natural gas market in Georgia is divided into three sectors, the power generation sector, the household sector and the commercial sector.

Power generation sector is characterized by significant fluctuations in gas consumption depending on climatic conditions, as well as periodic shut downs of Enguri HPP, the largest HPP in Georgia, for rehabilitation works and drought conditions. According to data provided by GGTC, in 2011, the power generation sector accounted for approximately 629 mmcm of natural gas sales in Georgia, or 35.3% of the Georgian natural gas market.

The household sector currently comprises approximately 550,000 households. In 2009, GOGC commenced its regional gasification project, the Natural Gas for Every Village Project (the “NGFEVP”). The project involves the construction of new pipelines to regions, which previously did not have access to the natural gas supply network.

According to data provided by GGTC, household sector natural gas consumption grew by 7.2% and 17.3% in 2010 and 2011, respectively. In 2011, the household sector accounted for approximately 522 mmcm (29.3 %) of natural gas sales in Georgia. In 2011, the commercial sector accounted for approximately 631 mmcm of natural gas, or 35.4% of the natural gas market in Georgia.

Relations among natural gas suppliers, transportation and distribution licensees and direct customers are controlled by natural gas market regulations. Parties involved in natural gas sale and purchase or transportation services conclude bilateral or multilateral agreements.

In September 2007, the gas sector was partly reformed through revision to the Law on Electricity and Natural Gas. The Law authorized the Ministry of Energy to take a decision on deregulation or partial deregulation of the natural gas market, which it did by Order No. 69 (25/29/2007). Specifically, natural gas supply activities were deregulated; in addition, delivery activities for end consumers (households) that consume natural gas for noncommercial activities were partially deregulated.

Tariffs for natural gas transportation are shown in Annex 4 and the tariff methodology for the entire gas sector is included in Annex 5.

## **4.2 OPERATIONAL ENVIRONMENT**

In the gas and oil sector, Georgia already benefits from its important transit role.

Four pipelines exist, namely: 1) the Baku-Tbilisi-Ceyhan Pipeline (BTC) and 2) the South Caucasus Pipeline (SCP) within one right-of-way transporting petroleum and natural gas from the Caspian fields of Azerbaijan through Georgia to Turkey, commenced operations in 2005 and 2006, 3) the Western Route Export Pipeline (WREP), the Baku-Supsa pipeline transporting oil to Black Sea in operation since 1997 and 4) the North-South gas pipeline serving transit to Armenia (NSGP). Georgia receives a portion of the transported fuel as a transit fee. Georgia has a strong strategic role to play as a transit country, though geopolitics continues to threaten its transit potential.

The Ministry, rather than GNERC, has monitoring authority over technical rules and national natural gas balance.

## **4.3 NATURAL GAS SUPPLY**

- Insignificant local production<sup>4</sup>.
- Shakh Deniz Consortium (40% of the market) with a long-term contract for the project lifetime.
- SOCAR (60% of the market) with a long term supply contract through 2028 holds Khuloevi terminal and projects to build a chemicals plant-investment - \$700 mln.
- Transit fee for gas shipped from Russia to Armenia.

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<sup>4</sup> Current daily production of Ninotsminda field is 0.55 MMcf.

#### 4.4 NATURAL GAS PURCHASING

Pursuant to Decree No. 737, GOGC was designated as the exclusive buyer of natural gas obtained in respect of the Georgian section of the South Caucasus Pipeline (SCP) and currently holds such status by virtue of Decree No. 60. The Company also purchases natural gas from GGTC, which GGTC has received as a transit fee for Russian natural gas transported to Armenia through the NSGP section of the MGPS. In addition, the Company, as the NOC, receives natural gas pursuant to certain PSAs.

The following table sets the quantities and weighted average prices of natural gas purchased by GOGC, by supplier, for the years indicated:

**Table 3.1 Quantities and weighted average prices of natural gas purchased by GOGC<sup>5</sup>**

	Average Price (U.S.\$) per mcm and Traded Volume (mmcm)					
	2011		2010		2009	
	Price	Volume	Price	Volume	Price	Volume
SCP	61.22	737.8	58.74	525.9	60.11	406.7
SCP Supplemental Gas Agreement	65.67	501.3	64.56	300.4	63.54	305.4
SCP Option Gas Agreement	52.02	236.5	51.27	225.5	50.56	101.2
MGPS	110.00	178	110.00	169.6	140.30	218.9
NSGP	110.00	178	110.00	169.6	110.00	145.1
EWGP	0	-	0	-	200.00	73.8
PSAs	75.06	4.3	0	2.8	0	4.3
<b>Total</b>	<b>70.78</b>	<b>920</b>	<b>71.05</b>	<b>698.3</b>	<b>87.72</b>	<b>629.8</b>

#### 4.5 SCP

In accordance with Decree No. 737 and the SCP Host Government Agreement, the GOGC has entered into two long-term agreements for the purchase of natural gas in respect of the SCP: the SCP Option Gas Agreement and the SCP Supplemental Gas Agreement.

##### SCP Option Gas Agreement

The Company is party to the SCP Option Gas Agreement, an option agreement originally concluded between the Company's predecessor, GIOC, and SCP Option Co. dated 30 October 2003. SCP Option Co. is a subsidiary of South Caucasus

<sup>5</sup> The Prospectus of GOGC, issued in May, 2012

Pipeline Company Limited, which was established by the SCP project participants. South Caucasus Pipeline Company Limited guarantees the performance by SCP Option Co. of its obligations under the SCP Option Gas Agreement.

Under the SCP Option Gas Agreement, the Company has the right (but not the obligation) to purchase, and SCP Option Co. has the corresponding obligation to deliver, in each year, Option Gas, comprising a volume of natural gas up to 5 % of the natural gas transported through Georgia via the SCP.

The SCP Option Gas Agreement has a term of 60 years from 3 July 2007. The SCP Option Gas Agreement provides that SCP Option Co. has the right to terminate the SCP Option Gas Agreement early, on the expiry or cessation of the SCP Host Government Agreement or the permanent cessation of the delivery of natural gas through the SCP. SCP Option Co. may also suspend or cease delivery of Option Gas if the Company fails to pay any sum due to SCP Option Co. within three days of written request.

The delivery of natural gas to the Company under the SCP Option Gas Agreement began in October 2008. The Company purchased 236.5 mmcm of Option Gas in the year ended 31 December 2011, as compared to 225.5 mmcm and 101.2 mmcm of Option Gas in the years ended 31 December 2010 and 2009, respectively.

The purchase price for Option Gas under the SCP Option Gas Agreement was initially fixed at U.S \$50.0 per mcm, subject to an annual increase of 2.0%. As at 31 December 2011, the purchase price paid by the Company was U.S \$52 per mcm.

#### SCP Supplemental Gas Agreement

GOGC is also a party to the SCP Supplemental Gas Agreement, entered into between the Company (originally GIOC) and AGSC on 30 October 2003. AGSC was established by the international oil companies participating in upstream activities at the Shah-Deniz Field in Azerbaijan.

Delivery of natural gas to the Company pursuant to the SCP Supplemental Gas Agreement began in January 2007. Pursuant to the SCP Supplemental Gas Agreement, AGSC is obliged to sell, and the Company is obliged to purchase, regardless of the volumes transported through the MGPS (subject only to technical impossibility), Supplemental Gas.

#### **4.6 NATURAL GAS PRICES**

GOGC sells all of the natural gas it purchases to SOCAR Gas Export-Import pursuant to the SOCAR Gas Sales Agreement. The natural gas the Company acquires pursuant to PSAs is sold directly to the commercial sector at market rates. The following table sets forth the fixed prices of natural gas, by sector, pursuant to the SOCAR Gas Sales Agreement for the years indicated:

**Table 3.2 Natural gas sale price GOGC charges SOCAR Gas Supply (US\$ million per mcm) <sup>6</sup>**

	Social Gas: Household and Power Generation	Sectors Commercial Gas: Commercial sector
2012	116.3	Base market price(1)/1.23
2013	116.8	Base market price/1.225
2014	122.3	Base market price/1.17
2015	122.3	Base market price/1.17
2016	122.8	Base market price/1.165
2017	128.3	Base market price/1.115
2018	128.3	Base market price/1.115
2019	130.0	Base market price/1.10
2020	130.0	Base market price/1.10
2021	131.8	Base market price/1.085
2022	131.8	Base market price/1.085
2023	131.8	Base market price/1.085
2024	131.8	Base market price/1.085
2025	131.8	Base market price/1.085

The SOCAR Gas Sales Agreement expires on 31 December 2030, subject to renegotiation of its terms in 2020.

## **5.0 LEGAL FRAMEWORK**

### **5.1 REGULATION OF UPSTREAM AND DOWNSTREAM ACTIVITIES**

Upstream and downstream activities in Georgia are regulated by different regulators. Upstream activity is handled by the State Agency of Oil and Gas, while downstream regulation falls within the competence of Georgian National Energy and Water Supply Regulatory Commission. In two sections below the functions of the two regulators in the gas sector are explained.

### **5.2 STATE AGENCY OF OIL AND GAS**

State Agency of Oil and Gas (hereinafter “the Agency”) is the legal entity of public law functioning within the system of the Ministry of Energy of Georgia. The Agency carries out its functions in accordance with the Law of Georgia on Oil and Gas. The state management and regulation of oil and gas operations, oil refining, gas treatment and/and transportation activity is carried out by Agency.

The main functions of the Agency are:

<sup>6</sup> The Prospectus of GOGC, issued in May, 2012

- after consultations with the respective governmental institutions to select the area to be offered to the investor for conducting oil and gas operations; to make decision on the form (tender or auction) in which to offer the area, and on the form of contract;
- to formulate tender conditions and auction rules to identify the winner for the area offered to investors for conducting oil and gas operations;
- to arrange and hold tenders and auctions, to identify the winner for the area offered to investors for conducting oil and gas operations;
- to prepare all contracts, to hold negotiations and sign contracts on behalf of the state; when preparing contracts and holding negotiations the Agency is entitled to request and receive assistance from any governmental institution and state enterprise and organization;
- to issue licenses on conducting oil and gas operations to investors on behalf of the state; to approve and grant, or giving the guarantee of granting all required powers, leases and allotments, permits, certificates. Upon receipt of the Agency 's application, all the governmental institutions of Georgia shall prepare and furnish the requested documents to the Agency;
- to supervise and control the compliance with the terms and conditions set forth in the contract made in accordance with this Law and in the General License to Use Oil and Gas Resources; to provide all necessary conditions in order for the investor to fulfill the obligations arising out of the contract and license;
- to create and manage (gathering, systematization, analysis and storage of information and data) the central database of all data and information related to the oil and gas resources and operations in Georgia;
- to issue normative acts for creation of a nondiscriminatory legal environment and for promoting effective performance of oil and gas operations, in consideration of market principles and national interests;
- to transfer all operational and commercial duties provided by contracts (other than the regulatory functions) to the National Oil Company as long as the state or state company holds more than 50% of its stocks, to exercise control over the fulfillment of all the operational and commercial duties which are provided by contracts and transferred to the National Oil Company;
- to issue oil refining, gas treatment, oil transportation or gas transportation licenses (License of Activity) on behalf of the state; to issue all the necessary permits and approve funds;
- to supervise and control the fulfillment of the terms and conditions of the License of Activity and oil refining, gas treatment and transportation activity; to provide the necessary conditions for the holder of the License of Activity to fulfill his obligations under the license;

- to supervise oil refining and gas treatment in order to ensure environmental safety and assure the quality of oil and gas products;
- in case of necessity, to set up and manage a laboratory in accordance with the laws of Georgia;
- to create and manage (to collect, systematize, analyze and store data and information) the central databank of all the data and information related to oil refining, gas treatment and transport activity;
- to issue normative acts aimed at promoting the effectiveness of oil refining, gas treatment and transportation activity, in consideration of on the national interests, policy and market principles;
- to take part in development, modification and approval of standards of raw material and oil and gas product standards; and,
- To establish the transportation tariffs for raw material and oil and gas products.

In discharging these functions the Agency shall abide by the principle of publicity; in the course of formulating the tender and auction conditions, the Agency shall hold their public discussions and approve these conditions after such discussions.

The contract under which the investor is granted the rights to exploit oil and gas resources and to use oil and gas-bearing entrails on the area is made between the state and the investor only who has been identified as the winner in the tender or auction held by the Agency. The conditions for holding a tender and an auction shall be identically reflected in the contract and in the General License to Use Oil and Gas Resources issued in accordance with the Law of Georgia on Oil and Gas. The Agency determines the rules and procedure for holding a tender or an auction and registers the applicants with the Ministry of Justice of Georgia one month prior to the announcement of the tender or auction.

### **5.3 GEORGIAN NATIONAL ENERGY AND WATER SUPPLY REGULATORY COMMISSION (GNERC)**

GNERC is independent of State bodies, agencies and organizations. It was established in 1996. Its main functions in gas sector are:

- Determining the rules and conditions of natural gas supply, transportation and distribution licensing, including issuing, modifying, seizing and/or cancelling the licenses based on the rule of law and regulations vested therein;
- Defining and regulating the tariffs for supply and consumption in the electricity and natural gas sectors of Georgia;
- Within its competence, resolving disputes between licensees and those consumers within its competence; and,

- Monitoring observance of the license conditions in natural gas sector and discouraging violations through set procedures as provided by law.

Natural gas tariffs and tariff methodologies are approved by GNERC. The Commission collects information on financial results, annual reports and gas balances. Information is audited and verified.

Key issues remaining include; increasing collection rates, improving metering systems for natural gas and reducing natural gas commercial losses. Gas meters are installed for each individual consumer and are usually installed outside the apartment.

GNERC collects feedback from licensees on regular basis studying their activities. By virtue of the Law of Georgia on Electricity and Natural Gas, regulation of licensees includes their regular monitoring:

- Licensees present the Commission with annual reports (both technical and financial). Based on these the Commission elaborates certain recommendations.
- In controversial or suspicious cases, monitoring is conducted immediately.
- Commission settles disputes between licensees or between consumers and licensees, assuming the role of a mediator.

The procedure of settlement of disputes is as follows:

1. Information about received complaint is sent to the other party;
2. Upon reception of the other party's answer, the issue is discussed on a working meeting with participation of both parties;
3. If needed – on the spot investigation is conducted;
4. In case consensus has been reached – the dispute is settled;
5. In case no consensus has been reached, the issue is to be discussed on the meeting of the Commission, whereupon the Commission passes resolution mandatory for both parties; and,
6. Both parties have the right to file a complaint against Commission's Resolution.

#### **5.4 NETWORK ACCESS AND TARIFFS**

A similar tariff framework, as identified for electricity, applies for natural gas. Over the last decade new supply routes and suppliers were introduced, security of supply has increased significantly, and gas supply has been deregulated. In the natural gas market, licenses are mandatory for the gas transportation and distribution.

Natural gas supply and transportation system connection procedures are overseen by Natural Gas Market Rules, issued by the Ministry. The 2005 amendments to the Law on Electricity and Natural Gas removed some rulemaking powers from the regulatory commission and transferred these to the Ministry of Energy in the gas sector as well as the electricity sector. The amended Law gives the Ministry of



Energy the authority to approve the natural gas balance and the natural gas market rules.

The Market Rules require that a third party seeking access to the transportation system submit to the transportation licensee a special request for connection to the transportation system. The transportation licensee may decline the request only in case if the connection to a licensee's or direct consumers' natural gas transportation system may have a negative impact on the whole transportation system. Connected facilities become operational upon the applicant compensating the transportation company for all the costs related to the new connection to the network.

## **5.5 KEY LEGAL DOCUMENTS**

A short summary of each existing key legal document relating to the natural gas sector are shown in Annex 3. The documents include:

- Law of Georgia on Electricity and Natural Gas;
- Law of Georgia on Oil and Gas;
- Order of the Minister of Energy on Gas Market Rules;
- Order of the Ministry of Energy on Deregulation and Partial Deregulation of Natural Gas Supply; and,
- GNERC resolutions on licensing and tariffs.

## **6.0 PHYSICAL STRUCTURE**

The main gas pipelines in Georgia are shown on Figure 5.1.

### **Figure 5.1 Maps of Gas Pipelines**



The South Caucasus gas pipeline (SCP) which carries gas from the Shah Deniz field in the Caspian to markets in Azerbaijan, Georgia and Turkey is operated by British Petroleum.

## 7.0 LOCAL GAS PRODUCTION

Currently, a small gas producer operates in Ninotsminda region of Georgia. The Ninotsminda field contains both oil and gas. Industrial oil extraction started in Ninotsminda in 1979. Gas extraction began in 1983. Through 2002, the total extracted oil amounted to 15 million tons. In 1997-2002, 150 million m<sup>3</sup> of gas was produced.

During the last five years annual gas production has averaged 16.5 million cubic meters. In all, Georgia has extracted about 2.8 bcm of gas and 552.8 mcm of free gas.

Currently, daily production of the field is 270 Barrels of oil (BBL) and 0.55 MMcf of natural gas. The total gas reserves are approximately 122 mln m<sup>3</sup><sup>7</sup>.

All gas produced from the Ninotsminda Field, with the exception of that required by the field operator for its own use, is made available under the Gas Sales Agreement. The parties to the agreement include GOGC, the state oil company, as the seller parties and Georgian Gas Transportation Company, the state-owned gas transmission company, as the buyer. The buyer in turn delivers the gas to the Gardabani gas-fired thermal power station. The delivery point under the agreement is the gas gathering facility located on the Ninotsminda Field and the buyer, at its

<sup>7</sup> Source: Blake oil and gas limited

cost, has agreed to undertake to repair and maintain 41-km gas pipeline that delivers the gas from Ninotsminda to Gardabani TPP station.

## 8.0 NEW GAS-FIRED UNITS AND IMPACT ON INVESTMENTS IN HYDROPOWER IN GEORGIA

### 8.1 DOMESTIC ELECTRICITY DEMAND AND GROWTH OF HIGH COST (THERMAL AND IMPORTS) ELECTRICITY SOURCES

For the first time since 2007, Georgia in 2012 became a net electricity importer (Table 7.1). At the same time Georgia was forced to use for 9 months of the year its mostly old generating units at Gardabani, as well as electricity imports. Both of these energy sources are relatively expensive.

**Table 7.1 Historical data (MWh)**

				<i>Consumption</i>	
	<i>Import</i>	<i>TPPs</i>	<i>HPPs</i>	<i>with losses</i>	<i>Export</i>
<b>2007</b>	433	1445	6725	7977	626
<b>2008</b>	649	1226	7054	8249	680
<b>2009</b>	255	964	7315	7785	749
<b>2010</b>	222	656	9264	8618	1524
<b>2011</b>	470	2123	7789	9452	930
<b>2012</b>	615	2350	7122	9559	528

Source: ESCO

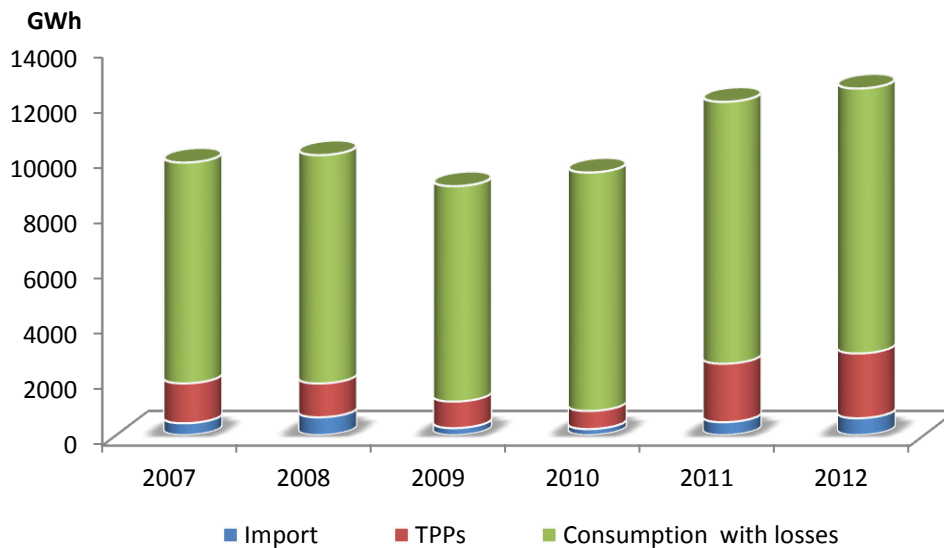
The price of import from Russia is estimated at \$60-65/MWh according to ESCO and the price of generation on existing TPPs are \$55-58/MWh in accordance with the tariffs approved by GNERC taking into account fees for guaranteed capacity and the use of preferential gas supplied by Azerbaijan (see above). In the structure of domestic consumption, this volume of expensive electricity has increased significantly in recent years (see Figures 8.1 and 8.2).

In 2009, Georgia and Azerbaijan signed a contract for the supply of social gas for a period of 5 years (the price for residential sector - \$ 167/mcm, for TPPs - \$143/mcm) with the possibility of extension for another 5 years. The volume of this agreement was 1.05 bcm per year (0.35 for residential and 0.7 for TPPs).

The term of this agreement is coming to an end; however, the question of the extension has not been resolved yet. In any case, one can assume that these volumes are unlikely to be increased.

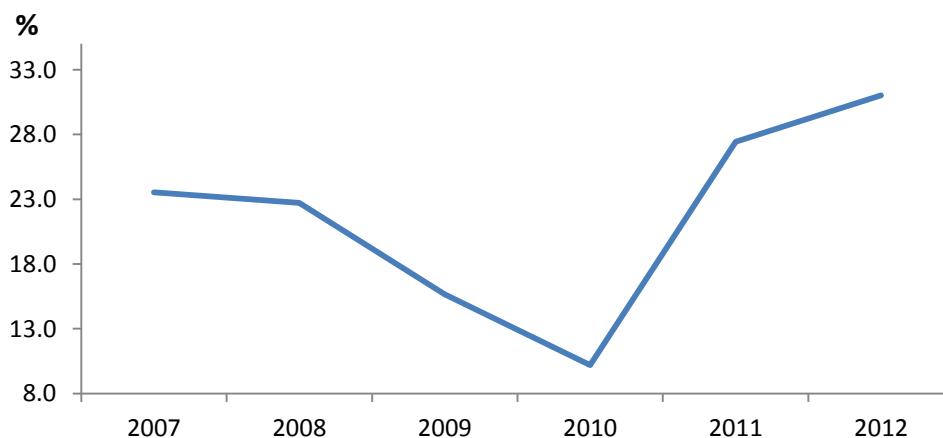
As can be seen from Table 7.1 below, in 2012 thermal generation totaled 2350 GWh. This shows that the estimated preferential gas is fully used considering that the average efficiency of these stations is very low.

**Figure 7.1 Gas-fired generation in MWh by years**



Source: ESCO

**Figure 7.2 Share of Gas-fired generation in domestic consumption**



Source: ESCO

In addition, it is necessary to take into account the growing level of gasification for Georgian population, which may lead to a redistribution of volumes of preferential gas between the population and the TPPs in favor of the former.

Georgia also receives "free of charge" gas as payment for transit of Russian gas to Armenia (10% of the total supply to Armenia). However, it should be noted that this volume will also be reduced due to possible demand decrease in Armenia taking into account gas price increase for consumers in Armenia of 18% from July 2013 (under the previous tariff increase in 2010 of 37% for gas consumers, who consume up to 10 mcm of gas per month, the consumption dropped by over 30%

compared with 2008). Thus, the average price of gas supplies to Georgia will increase due to the growth of the volume of gas offered at commercial prices.

It's important to Georgia to increase the efficiency of gas consumption in Georgia, particularly for electricity generation, which involves the old TPPs replacement by new effective units. Thus, it is necessary to build new thermal units not to be in conflict with the priority of Georgia – construction of new HPPs.

## **8.2 NEW GENERATION SOURCES DEVELOPMENT**

Analysis of the growth of domestic electricity consumption in Georgia (please see USAID/HIPP, Regional Electricity Trade Report, August 2013), shows consumer demand growth is higher in summer in Georgia compared with winter.

Even if one assumes the most minimal percentage of load growth (2%) for the months when TPPs are operated (in 2012 for 9 months consumption was 7250 GWh except May-July), it can be seen that additional electricity demand in 2020 will be 1250 GWh without losses (domestic consumption for 9 months is 8500GWh).

To replace expensive electricity production and imports required to meet the growth of domestic consumption other than with the priority development of hydropower in Georgia, the possibility of building modern power plants running on natural gas is also considered. New TPPs can be beneficial because:

- 1) It is necessary to generate in the winter, when there is reduced water flow for electricity production; and,
- 2) most of the new HPPs are "run of river" projects, that taking into account the high ratio of daily maximum to minimum (often 1.9 or more) will impose certain requirements for the power system flexibility that TPPs can provide.

It should be noted that the construction of a new HPPs and modern TPPs can go in parallel and do not contradict each other, given a large potential of electricity to cover both domestic consumption and export to Turkey. Electricity production prices for new TPPs are also not a barrier for investors in hydropower.

New TPPs can be either a combined cycle (CCGT) or gas turbines. The first type has a higher efficiency, but allows unloading only down to 40% while gas turbines are significantly less efficient, however, with virtually unlimited regulation.

Taking into account the need to curb prices rising, one can estimate potential for the generation of combined cycle plants with an efficiency of 53-55% in Georgia. The specifics of Georgian Power System determine a slightly smaller capacity factor (part of the year TPPs do not operate). Let's assume capacity factor is 70%.

To estimate the remaining costs we use the data prepared by US Energy Information Administration and shown in Table 7.2.

**Table 7.2 Estimated Levelized Cost of New Generation Resources, 2016**

Plant Type	Capacity Factor (%)	U.S. Average Levelized Costs (2009 \$/megawatthour) for Plants Entering Service in 2016				
		Levelized Capital Cost	Fixed O&M	Variable O&M (including fuel)	Transmission Investment	Total System Levelized Cost
Conventional Coal	85	65.3	3.9	24.3	1.2	94.8
Advanced Coal	85	74.6	7.9	25.7	1.2	109.4
Advanced Coal with CCS	85	92.7	9.2	33.1	1.2	136.2
Natural Gas-fired						
Conventional Combined Cycle	87	17.5	1.9	45.6	1.2	66.1
Advanced Combined Cycle	87	17.9	1.9	42.1	1.2	63.1
Advanced CC with CCS	87	34.6	3.9	49.6	1.2	89.3
Conventional Combustion Turbine	30	45.8	3.7	71.5	3.5	124.5
Advanced Combustion Turbine	30	31.6	5.5	62.9	3.5	103.5
Advanced Nuclear	90	90.1	11.1	11.7	1.0	113.9
Wind	34	83.9	9.6	0.0	3.5	97.0
Wind – Offshore	34	209.3	28.1	0.0	5.9	243.2
Solar PV <sup>1</sup>	25	194.6	12.1	0.0	4.0	210.7
Solar Thermal	18	259.4	46.6	0.0	5.8	311.8
Geothermal	92	79.3	11.9	9.5	1.0	101.7
Biomass	83	55.3	13.7	42.3	1.3	112.5
Hydro	52	74.5	3.8	6.3	1.9	86.4

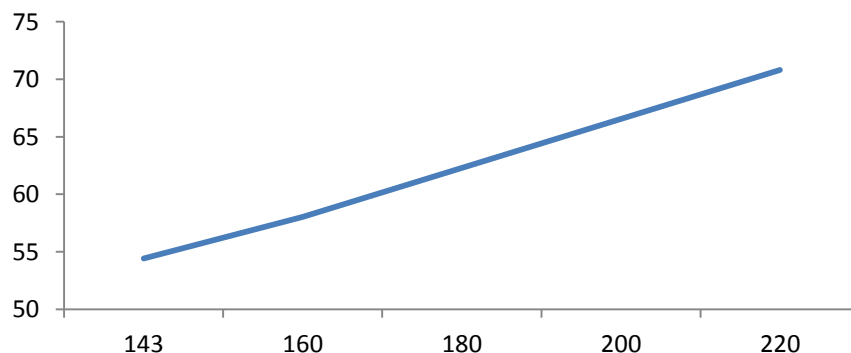
Source: EIA report, 2011

With 70% capacity factor, the levelized capital and fixed O&M costs for a CCGT will be \$24/MWh.

The analysis below will assume the fuel costs will include a combination of the preferential (\$143/mcm), and commercial (\$220/mcm). Also the analysis will assume that a new CCGT with 53-55% efficiency will produce net generation of 4.7 MWh/1000cm gas.

Fig. 8.4 shows possible prices for combined cycle plant in dependence on the gas prices with a capacity factor of 70%.

**Figure 8.4 Net generation price in \$/MWh in dependence of gas price in \$/mcm**



The Government of Georgia is contemplating the introduction of a wind farm in the power sector. For operating wind turbines on the power network with frequent swings in energy production, it is necessary to ensure sufficient operating reserves, especially with TPPs. Given the age and operating characteristic of the existing Gardabani TPPs, the potential increased operating reserves points to the need to construct new gas-fired TPPs. Gas turbines typically produce more expensive electricity than HPPs but should be considered if more flexibility is required.

### **8.3 NEW TPPS IMPACT ON INVESTMENT IN HYDROPOWER SECTOR OF GEORGIA**

In summary, new HPPs in Georgia should not suffer from construction of new TPPs because:

- New HPPs will be competitively priced compared to new TPPs;
- New TPPs will enable HPPs to fully utilize water flow (balancing will be provided by TPPs); and,
- New TPPs will enable HPPs to increase the export potential to Turkey (part of domestic consumption will be covered by TPPs).

## 9.0 ANNEX 1 NATURAL GAS BALANCES (2009-2012)

Gas Monthly Balance (million m3) 2009																										
	January		February		March		April		May		June		July		August		September		October		November		December		2009	
Name	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual
mtkvvari-energetika	49.60	47.70	44.80	16.00	23.70	15.23	0.00	0.00	0.00		0.00		0.00		0.00		22.80		46.20	37.58	50.40	37.82	52.11	48.89	289.61	203.22
Tbilisrest	48.25	19.03	28.00	0.13	11.25	8.01	0.00	14.38	0.00		0.00		0.00		0.00		0.00	26.51	3.75	1.08	30.00	0.14	41.00	3.45	162.25	72.73
air-turbina	0.00	0.26	0.00	1.10	0.00	0.35	0.00	6.38	0.00	0.05	0.00	0.07	0.00	0.06	0.00	0.48	0.00	0.07	0.00	0.21	0.00	0.05	0.00	5.77	0.00	14.84
<b>Thermal</b>	<b>97.85</b>	<b>66.98</b>	<b>72.80</b>	<b>17.23</b>	<b>34.95</b>	<b>23.60</b>	<b>0.00</b>	<b>20.76</b>	<b>0.00</b>	<b>0.05</b>	<b>0.00</b>	<b>0.07</b>	<b>0.00</b>	<b>0.06</b>	<b>0.00</b>	<b>0.48</b>	<b>22.80</b>	<b>26.58</b>	<b>49.95</b>	<b>38.87</b>	<b>80.40</b>	<b>38.01</b>	<b>93.11</b>	<b>58.11</b>	<b>451.86</b>	<b>290.79</b>
Kaztransgaz-Tbilisi	52.00	33.02	45.00	36.06	43.00	37.68	21.00	27.71	14.00	12.36	8.00	9.06	7.50	7.40	7.00	8.15	8.00	9.53	13.00	11.74	34.00	28.70	52.00	47.20	304.50	268.62
Itera Georgia	12.00	18.41	11.50	13.88	10.00	10.66	7.50	7.55	7.00	4.03	6.00	3.12	5.50	3.14	4.50	3.50	5.00	3.60	7.00	4.26	11.50	6.90	12.00	10.85	99.50	89.90
Georgian International Energy Corporation	1.08	1.27	1.08	0.75	1.08	0.50	0.68	0.33	0.68	0.23	0.68	0.17	0.68	0.17	0.68	0.21	0.68	0.21	0.80	0.24	0.80	0.40	1.10	0.65	10.02	5.12
Sokar Georgia gaz	2.50	2.04	2.05	1.66	2.00	6.46	1.50	5.16	1.30	3.28	1.00	1.94	1.00	2.12	1.00	2.37	1.00	2.31	2.00	3.59	2.20	5.89	2.50	7.76	20.05	44.60
Visol petroleum Georgia	1.20	1.25	1.00	0.94	0.90	1.01	0.80	0.36	0.70	0.21	0.60	0.16	0.50	0.17	0.45	0.20	0.50	0.20	0.60	0.23	0.80	0.36	1.00	0.56	9.05	5.63
Sagarejo gas	1.00	1.69	1.00	0.96	1.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		1.00		1.00		5.00	2.65
<b>Households</b>	<b>69.78</b>	<b>57.68</b>	<b>61.63</b>	<b>54.25</b>	<b>57.98</b>	<b>56.31</b>	<b>31.48</b>	<b>41.11</b>	<b>23.68</b>	<b>20.11</b>	<b>16.28</b>	<b>14.45</b>	<b>15.18</b>	<b>13.00</b>	<b>13.63</b>	<b>14.43</b>	<b>15.18</b>	<b>15.85</b>	<b>23.40</b>	<b>20.06</b>	<b>50.30</b>	<b>42.25</b>	<b>69.60</b>	<b>67.02</b>	<b>448.12</b>	<b>416.52</b>
<b>Social</b>	<b>167.63</b>	<b>124.66</b>	<b>134.43</b>	<b>71.49</b>	<b>92.93</b>	<b>79.90</b>	<b>31.48</b>	<b>61.87</b>	<b>23.68</b>	<b>20.16</b>	<b>16.28</b>	<b>14.53</b>	<b>15.18</b>	<b>13.05</b>	<b>13.63</b>	<b>14.91</b>	<b>37.98</b>	<b>42.43</b>	<b>73.35</b>	<b>58.93</b>	<b>130.70</b>	<b>80.26</b>	<b>162.71</b>	<b>125.13</b>	<b>899.98</b>	<b>707.32</b>
Kaztransgaz-Tbilisi	23.00	37.04	20.00	14.74	12.00	13.86	9.00	6.65	7.00	3.81	6.00	3.39	5.00	3.65	4.00	2.45	5.50	2.84	7.00	3.80	11.00	7.04	16.00	11.23	125.50	110.50
Visol petroleum Georgia	1.40	0.55	1.30	0.49	1.10	0.56	1.00	0.49	1.05	0.47	1.00	0.45	1.00	0.55	1.15	0.62	1.15	0.60	1.20	0.62	1.60	0.60	1.60	0.57	14.55	6.56
Itera Georgia	20.00	7.40	16.50	7.60	8.00	7.51	6.50	6.97	8.00	6.50	8.50	6.85	9.00	6.79	7.50	7.05	8.00	7.22	8.00	7.14	10.50	8.71	20.00	10.62	130.50	90.35
sseki + gazenerji	19.00	5.37	19.00	4.38	19.00	3.82	15.00	5.99	15.00	3.67	15.00	1.68	15.00	2.11	15.00	2.38	15.00	2.36	15.00	2.26	19.00	1.93	19.00	1.83	200.00	37.77
Sokar gazexport	2.00	0.00	2.00	0.00	2.00	1.18	2.00	1.35	2.00	1.03	2.00	0.85	2.00	0.96	2.00	0.99	2.00	0.90	2.00	1.09	2.00	1.47	2.00	1.94	24.00	11.76
energy invest (azot)				0.11		0.74		0.72		0.78		0.87		3.16		3.59		3.80		3.19		3.28		2.08	0.00	22.31
GOGC	23.25	22.35	21.00	17.50	23.25	21.42	22.50	19.76	23.25	0.06	11.25		23.25	18.06	23.25	19.95	22.50	20.16	23.25	21.18	22.50	17.65	23.25	21.37	262.50	199.46
Gas Transportation Company							0.34		0.08		0.31		0.11		0.17		0.02		0.81							
<b>Commercial</b>	<b>88.65</b>	<b>72.70</b>	<b>79.80</b>	<b>44.81</b>	<b>65.35</b>	<b>49.09</b>	<b>56.00</b>	<b>42.26</b>	<b>56.30</b>	<b>16.53</b>	<b>43.75</b>	<b>14.91</b>	<b>55.25</b>	<b>35.43</b>	<b>52.90</b>	<b>37.22</b>	<b>54.15</b>	<b>37.93</b>	<b>56.45</b>	<b>40.09</b>	<b>66.60</b>	<b>40.68</b>	<b>81.85</b>	<b>49.64</b>	<b>757.05</b>	<b>478.70</b>
<b>Total Demand</b>	<b>257.28</b>	<b>197.36</b>	<b>214.23</b>	<b>116.30</b>	<b>158.28</b>	<b>128.99</b>	<b>87.48</b>	<b>104.13</b>	<b>79.98</b>	<b>36.68</b>	<b>60.03</b>	<b>29.43</b>	<b>70.43</b>	<b>48.48</b>	<b>66.53</b>	<b>52.13</b>	<b>92.13</b>	<b>80.36</b>	<b>129.80</b>	<b>99.02</b>	<b>197.30</b>	<b>120.94</b>	<b>244.56</b>	<b>174.77</b>	<b>1669.03</b>	<b>1180.80</b>
<b>Ninotsminda</b>									1.19		0.68		0.88		0.95		0.79		0.90		1.26		1.21		0.00	7.85
Saxdenizi		42.39		37.29		43.04		40.64		19.73		20.29		27.53		25.67		21.50		33.79		37.97		56.81		406.65
Sokari		111.40		50.63		37.20		42.80		7.27		0.14		14.07		21.57		43.86		43.19		51.09		88.65		511.87
<b>Azerbaijan</b>	<b>233.48</b>	<b>153.79</b>	<b>191.43</b>	<b>87.92</b>	<b>138.48</b>	<b>80.24</b>	<b>82.18</b>	<b>83.44</b>	<b>81.18</b>	<b>27.00</b>	<b>61.23</b>	<b>20.43</b>	<b>71.63</b>	<b>41.60</b>	<b>67.73</b>	<b>47.24</b>	<b>83.15</b>	<b>65.37</b>	<b>99.00</b>	<b>76.98</b>	<b>161.18</b>	<b>89.06</b>	<b>200.76</b>	<b>145.46</b>	<b>1471.43</b>	<b>918.52</b>
transit		22.18		1.50		30.92		7.24		0.62				3.01		8.56		19.25		25.20		23.35				141.83
russian generation (sseki)		0.00												2.11		2.38		2.36								6.85
russian generation (itera)		23.00		28.13		16.16		12.95		9.92		9.62		0.74		1.92		0.50		0.50		0.60		0.16		104.19
enerji invest		0.00																								0.00
<b>Russian Total</b>	<b>25.00</b>	<b>45.18</b>	<b>25.00</b>	<b>29.63</b>	<b>22.00</b>	<b>47.08</b>	<b>7.50</b>	<b>20.19</b>	<b>1.00</b>	<b>10.54</b>	<b>1.00</b>	<b>9.62</b>	<b>1.00</b>	<b>5.86</b>	<b>1.00</b>	<b>4.30</b>	<b>11.18</b>	<b>11.42</b>	<b>33.00</b>	<b>19.75</b>	<b>38.32</b>	<b>25.80</b>	<b>46.00</b>	<b>23.51</b>	<b>212.00</b>	<b>252.87</b>
<b>Total Supply</b>	<b>258.48</b>	<b>198.97</b>	<b>216.43</b>	<b>117.55</b>	<b>160.48</b>	<b>127.32</b>	<b>89.68</b>	<b>103.63</b>	<b>82.18</b>	<b>38.73</b>	<b>62.23</b>	<b>30.73</b>	<b>72.63</b>	<b>48.33</b>	<b>68.73</b>	<b>52.49</b>	<b>94.33</b>	<b>77.58</b>	<b>132.00</b>	<b>97.62</b>	<b>199.50</b>	<b>116.12</b>	<b>246.76</b>	<b>170.17</b>	<b>1683.43</b>	<b>1179.24</b>



### Gas Monthly Balance (million m3) 2010

Name	January		February		March		April		May		June		July		August		September		October		November		December		2010	
	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual
<b>Thermal Power Plants</b>	9196	4355	7470	3319	6696	046	000	060	000	009	000	134	000	050	000	137	000	2111	2960	1986	8004	2092	9271	5386	<b>435.97</b>	<b>196.86</b>
mtkvარი-ენერგეტიკა	5171	4113	4670	3312	5171	000	000	000	000	000	000	000	000	000	000	001	000	1939	2585	1913	5004	1615	5171	3193	<b>277.72</b>	<b>160.86</b>
Tბილსესი	4025	237	2800	000	1525	000	000	000	000	000	000	000	000	000	000	000	000	163	375	071	3000	448	4100	2175	<b>158.25</b>	<b>30.93</b>
აირ-ტურბინა	000	005	000	008	000	046	000	060	000	009	000	134	000	050	000	136	000	-010	000	003	000	030	000	018	<b>0.00</b>	<b>5.07</b>
<b>Households</b>	8605	7546	6829	6973	6269	6221	4958	3666	3546	2328	2395	1506	2005	1362	1558	13111	1578	1492	2329	2227	5227	4087	8134	5827	<b>534.33</b>	<b>445.47</b>
Kაზრანგაზ-ტბილსი	5600	527	4500	4898	4300	4338	3500	2391	2700	1463	1800	945	1400	821	900	7595	850	910	1300	1369	3400	2758	5200	4027	<b>354.50</b>	<b>299.53</b>
იტერა ჯორჯია	1900	138	1430	1266	1140	1139	790	715	430	466	330	349	340	328	370	3314	410	356	550	512	1030	796	1900	1117	<b>106.20</b>	<b>87.58</b>
Georgian International Energy Cor	108	05	065	044	065	043	042	037	021	027	021	021	016	025	018	0253	022	025	031	032	081	040	108	048	<b>5.98</b>	<b>4.20</b>
Visol Petroleum Georgia	042	05	038	045	023	039	018	031	017	023	016	017	016	017	018	0184	017	020	021	027	027	037	038	047	<b>2.91</b>	<b>3.66</b>
Sოკარ ჯორჯია გაზ	955	79	796	720	741	662	609	493	378	350	228	174	233	171	252	1765	278	180	427	288	688	456	888	589	<b>64.73</b>	<b>50.50</b>
<b>Commercial</b>	8256	2434	7470	2505	6687	2260	6313	1657	5408	1605	4807	1421	4396	1555	4209	1731	4695	1844	5676	2027	5858	2529	7617	3011	<b>713.92</b>	<b>245.79</b>
აზოტი(ენერჯი-ინვესტი)	2325	2057	2100	1875	2325	1565	2250	2077	2325	2000	2250	1991	2325	2039	2325	2024	2250	2045	1500	1152	2325	2152	2325	1040	<b>266.25</b>	<b>220.18</b>
Kაზრანგაზ-ტბილსი	3000	1100	2800	994	2200	760	1900	480	1300	358	1000	280	700	248	600	247	800	285	1400	429	2100	813	2500	1297	<b>203.00</b>	<b>72.91</b>
Georgian International Energy Cor	700	227	620	233	580	266	428	244	338	259	230	262	180	301	100	298	226	302	333	317	450	346	682	344	<b>48.67</b>	<b>34.00</b>
იტერა ჯორჯია	1430	688	1220	656	1159	735	1090	609	845	668	720	585	600	682	590	677	823	658	988	651	1130	781	1390	872	<b>119.85</b>	<b>82.63</b>
Sოკარ ჯორჯია გაზ	262	231	203	224	171	232	143	148	099	108	089	085	089	102	091	099	088	106	116	122	151	164	192	221	<b>16.94</b>	<b>18.41</b>
გაზექსპორტი	410	107	406	334	140	196	396	115	393	154	410	158	409	158	409	337	414	411	418	438	417	345	408	190	<b>46.30</b>	<b>29.42</b>
Visol Petroleum Georgia	104	063	096	055	087	060	082	056	082	051	082	052	068	060	068	069	068	070	072	068	085	077	095	085	<b>9.89</b>	<b>7.67</b>
Transportation losses	100	-461	100	-378	100	-163	100	047	100	-030	100	-179	100	-207	100	000	100	-121	100	-206	100	-300	100	-567	<b>12.00</b>	<b>-25.65</b>
<b>Total demand</b>	26157	16392	21869	14672	19752	10092	11371	7461	9054	5942	7301	5052	6501	5006	5867	5203	6372	7493	11066	7392	19189	10860	25121	16549	<b>1696.20</b>	<b>1121.14</b>
<b>Azerbaijan (Shahdeniz)</b>	21414	5624	17415	4707	15329	4563	10703	5425	8473	3884	6831	3018	6078	2985	5524	2466	5906	5259	10490	3318	15099	5577	19796	5762	<b>1430.58</b>	<b>525.87</b>
<b>Russia</b>	4650	2702	4370	2855	4330	1736	578	163	488	580	380	370	330	258	250	725	376	281	483	554	4000	2384	5232	6160	<b>254.67</b>	<b>187.68</b>
<b>Local</b>	093	109	084	092	093	092	090	092	093	078	090	047	093	045	093	041	090	045	093	042	090	048	093	050	<b>10.95</b>	<b>7.81</b>
<b>Sokar</b>	000	7379	000	6314	000	3176	000	1452	000	1118	000	1151	000	1312	000	1305	000	1466	000	3088	000	2206	000	3890	<b>0.00</b>	<b>338.57</b>
<b>Total Supply</b>	26157	16022	21869	14238	19752	9896	11371	7322	9054	5892	5890	4827	6501	4844	5867	5020	6372	7467	11066	7146	19189	10530	25121	16203	<b>1682.09</b>	<b>1094.06</b>

**Gas Monthly Balance (million m3) 2011**

Name	January		February		March		April		May		June		July		August		September		October		November		December		2011	
	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual
<b>Thermal Power Plants</b>	107.56	100.11	108.71	102.85	90.99	94.36	15.00	52.68	0.00	0.10	0.00	0.01	0.00	0.72	0.00	1.13	30.36	70.14	65.75	58.34	78.81	49.95	81.35	98.42	<b>578.53</b>	<b>628.79</b>
Mikvari-energetika	51.05	43.59	46.11	37.69	28.99	48.55	0.00	40.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	30.36	47.34	51.05	45.53	49.41	48.52	51.05	50.03	<b>308.02</b>	<b>361.42</b>
Tbilisresi	56.51	56.51	54.60	54.60	62.00	39.00	15.00	6.55	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.02	0.00	22.42	14.70	12.80	29.40	1.21	30.30	48.33	<b>262.51</b>	<b>242.45</b>
Air-turbine	0.00	0.01	8.00	10.56	0.00	6.82	0.00	6.03	0.00	0.09	0.00	0.00	0.00	0.72	0.00	0.02	0.00	0.39	0.00	0.01	0.00	0.22	0.00	0.06	<b>8.00</b>	<b>24.93</b>
<b>Households</b>	72.79	76.90	74.33	79.73	60.98	67.71	39.77	45.64	23.80	22.98	15.66	15.15	15.01	13.64	14.76	12.840	16.17	15.54	23.06	24.37	44.79	68.24	76.14	91.03	<b>477.27</b>	<b>522.72</b>
Kaztransgaz-Tbilisi	49.00	52.8	48.90	54.21	41.00	45.34	26.00	31.17	15.00	14.71	9.50	9.19	9.00	7.87	8.50	6.745	9.50	8.53	14.00	13.50	30.00	43.22	54.00	60.73	<b>314.40</b>	<b>336.29</b>
Itera Georgia	15.50	15.5	16.80	16.79	12.00	14.66	7.50	8.73	5.00	5.06	3.70	3.83	3.50	3.55	3.50	3.690	3.70	4.47	4.60	6.33	8.20	16.35	13.10	20.04	<b>97.10</b>	<b>120.34</b>
Georgian International Energy	0.56	0.6	0.59	0.66	0.59	0.46	0.56	0.32	0.37	0.23	0.29	0.18	0.34	0.17	0.37	0.185	0.47	0.26	0.50	0.32	0.63	0.50	0.98	0.61	<b>6.24</b>	<b>4.67</b>
Visol Petroleum Georgia	0.54	0.6	0.54	0.62	0.39	0.46	0.31	0.35	0.23	0.23	0.17	0.19	0.17	0.19	0.19	0.220	0.20	0.26	0.26	0.35	0.36	0.65	0.46	0.72	<b>3.83</b>	<b>4.96</b>
Sokar Georgia gaz	7.20	7.4	7.50	7.45	7.00	6.79	5.40	5.08	3.20	2.76	2.00	1.76	2.00	1.88	2.20	2.000	2.30	2.02	3.70	3.86	5.60	7.52	7.60	8.93	<b>55.70</b>	<b>56.47</b>
<b>Commercial</b>	<b>55.74</b>	<b>28.30</b>	<b>56.27</b>	<b>29.74</b>	<b>54.48</b>	<b>53.17</b>	<b>46.42</b>	<b>44.49</b>	<b>46.87</b>	<b>44.06</b>	<b>34.60</b>	<b>44.65</b>	<b>45.77</b>	<b>35.29</b>	<b>45.85</b>	<b>47.19</b>	<b>46.01</b>	<b>49.34</b>	<b>48.20</b>	<b>59.91</b>	<b>50.55</b>	<b>72.48</b>	<b>55.29</b>	<b>68.12</b>	<b>586.06</b>	<b>631.20</b>
Karat+	23.25	22.30	21.00	19.90	23.25	21.51	22.50	21.37	23.25	21.89	12.00	20.60	23.25	13.26	23.25	21.79	22.50	22.03	23.50	22.33	22.50	22.85	23.25	23.66	<b>263.50</b>	<b>252.65</b>
Kaztransgaz-Tbilisi	15.60	12.00	17.10	11.98	11.00	11.01	5.00	6.00	4.00	2.99	3.00	3.94	2.50	3.83	2.50	4.66	3.00	4.96	4.00	8.71	7.00	20.00	11.00	16.98	<b>85.70</b>	<b>117.85</b>
Georgian International Energy	3.48	3.28	3.31	3.14	6.30	5.80	6.46	4.47	6.60	6.77	6.60	7.92	6.62	5.92	6.66	6.08	6.84	6.61	6.76	10.51	6.62	8.11	6.36	6.20	<b>72.60</b>	<b>76.51</b>
Itera Georgia	8.10	8.31	8.70	8.97	7.70	9.07	6.70	8.56	6.70	7.51	6.70	7.13	7.10	6.82	7.10	6.92	7.20	7.25	7.60	9.23	7.60	11.68	7.40	12.05	<b>88.60</b>	<b>99.97</b>
sokar Georgia gaz	2.00	1.79	2.00	1.87	2.00	1.75	1.50	1.40	1.20	0.81	1.20	0.76	1.20	0.83	1.20	0.89	1.30	1.30	1.40	1.56	1.50	2.88	1.90	2.97	<b>18.40</b>	<b>21.76</b>
power enerj	2.39	2.16	3.24	3.06	3.43	3.08	3.53	1.64	4.42	3.10	4.42	3.22	4.42	3.44	4.42	5.32	4.42	5.84	4.47	6.17	4.52	5.42	4.52	4.53	<b>48.15</b>	<b>47.83</b>
visol petroleumGeorgia	0.92	0.76	0.92	0.71	0.81	0.96	0.73	1.06	0.71	0.99	0.69	1.09	0.69	1.19	0.73	1.36	0.76	1.33	0.73	1.36	0.81	1.44	0.87	1.67	<b>9.36</b>	<b>13.83</b>
Transportation losses	1.00	-8.55	1.00	-3.85	1.00	-1.47	1.00	-3.64	1.00	-0.02	1.00	1.46	1.00	1.21	1.00	0.54	1.00	-5.98	1.00	-3.76	1.00	-4.11	1.00	-5.23	<b>12.00</b>	<b>-33.40</b>
<b>Total Demand</b>	<b>236.10</b>	<b>205.30</b>	<b>239.31</b>	<b>212.32</b>	<b>206.45</b>	<b>215.24</b>	<b>101.19</b>	<b>142.82</b>	<b>70.67</b>	<b>67.13</b>	<b>50.26</b>	<b>59.80</b>	<b>60.79</b>	<b>49.65</b>	<b>60.60</b>	<b>61.15</b>	<b>92.54</b>	<b>135.02</b>	<b>137.02</b>	<b>142.62</b>	<b>174.15</b>	<b>190.67</b>	<b>212.79</b>	<b>257.57</b>	<b>1641.86</b>	<b>1782.73</b>
<b>Azerbaijan (Saxdenizi)</b>	<b>143.62</b>	<b>58.98</b>	<b>190.00</b>	<b>35.78</b>	<b>194.15</b>	<b>70.82</b>	<b>93.73</b>	<b>68.01</b>	<b>63.07</b>	<b>53.93</b>	<b>42.66</b>	<b>55.31</b>	<b>53.17</b>	<b>44.23</b>	<b>52.95</b>	<b>39.10</b>	<b>84.70</b>	<b>60.17</b>	<b>129.26</b>	<b>82.09</b>	<b>161.53</b>	<b>84.62</b>	<b>190.43</b>	<b>84.79</b>	<b>1399.26</b>	<b>737.81</b>
<b>Russia</b>	<b>92.48</b>	<b>79.02</b>	<b>49.31</b>	<b>41.08</b>	<b>12.30</b>	<b>8.00</b>	<b>7.46</b>	<b>5.11</b>	<b>7.60</b>	<b>0.26</b>	<b>7.60</b>	<b>1.99</b>	<b>7.62</b>	<b>2.37</b>	<b>7.66</b>	<b>18.75</b>	<b>7.84</b>	<b>11.69</b>	<b>7.76</b>	<b>10.62</b>	<b>12.62</b>	<b>5.15</b>	<b>22.36</b>	<b>7.81</b>	<b>242.60</b>	<b>224.71</b>
<b>Local</b>	<b>1.00</b>	<b>0.51</b>	<b>1.00</b>	<b>0.48</b>	<b>1.00</b>	<b>0.47</b>	<b>1.00</b>	<b>0.42</b>	<b>1.00</b>	<b>0.34</b>	<b>1.00</b>	<b>0.31</b>	<b>1.00</b>	<b>0.37</b>	<b>1.00</b>	<b>0.41</b>	<b>1.00</b>	<b>0.43</b>	<b>1.00</b>	<b>0.53</b>	<b>1.00</b>	<b>0.58</b>	<b>1.00</b>	<b>0.58</b>	<b>12.00</b>	<b>5.44</b>
sokar		77.87		147.59		131.15		62.07		6.93		0.00		0.00		0.00		57.20		41.11		94.90		156.36	<b>0.00</b>	<b>775.17</b>
<b>Total Supply</b>	<b>237.10</b>	<b>216.38</b>	<b>240.31</b>	<b>224.93</b>	<b>207.45</b>	<b>210.44</b>	<b>102.19</b>	<b>135.61</b>	<b>71.67</b>	<b>61.45</b>	<b>51.26</b>	<b>57.61</b>	<b>61.79</b>	<b>46.96</b>	<b>61.60</b>	<b>58.26</b>	<b>93.54</b>	<b>129.49</b>	<b>138.02</b>	<b>134.34</b>	<b>175.15</b>	<b>185.24</b>	<b>213.79</b>	<b>249.55</b>	<b>1653.86</b>	<b>1782.73</b>

**Gas Monthly Balance (million m3) 2012**

Name	January		February		March		April		May		June		July		August		September		October		November		December		2012	
	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual	balance	actual
<b>Thermal Power Plants</b>	100.00	103.84	90.00	109.79	85.00	118.19	40.50	28.59	0.00	0.07	0.00	0.84	0.00	2.01	0.00	22.98	20.00	69.97	25.25	84.03	40.50	70.17	62.50	91.10	<b>463.75</b>	<b>701.57</b>
Mikvari-energetika	53.00	47.98	50.00	43.24	50.00	48.04	40.00	17.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	41.39	25.00	43.23	35.00	39.74	50.00	37.61	<b>323.00</b>	<b>318.74</b>
Tbilisresi	41.00	49.78	35.00	55.70	30.00	58.16	0.00	8.39	0.00	0.07	0.00	0.00	0.00	1.59	0.00	22.39	0.00	27.18	0.00	40.79	5.00	30.33	12.00	51.29	<b>123.00</b>	<b>345.66</b>
Air-turbine	6.00	6.08	5.00	10.86	5.00	11.99	0.50	2.68	0.00	0.00	0.00	0.84	0.00	0.42	0.00	0.59	0.00	1.39	0.25	0.00	0.50	0.10	0.50	2.20	<b>17.75</b>	<b>37.16</b>
<b>Households</b>	74.75	87.91	72.05	97.12	68.50	85.07	45.80	30.97	21.55	19.52	14.95	16.42	13.40	15.83	13.00	14.29	14.50	15.95	21.25	19.77	40.50	39.27	72.65	86.51	<b>472.90</b>	<b>528.63</b>
Kaztransgaz-Tbilisi	50.00	57.1	48.00	63.73	46.00	54.51	30.00	19.23	13.00	11.76	9.00	9.89	8.00	8.79	7.00	7.189	8.00	8.64	13.00	10.87	25.00	23.57	50.00	56.12	<b>307.00</b>	<b>331.40</b>
Itera Georgia	16.00	20.6	16.00	22.43	15.00	20.47	10.00	7.05	5.00	4.90	4.00	4.29	3.50	4.58	3.50	4.560	4.00	4.76	4.50	5.67	9.00	8.96	14.00	18.26	<b>104.50</b>	<b>126.54</b>
Georgian International Energy	0.60	0.6	0.50	0.60	0.50	0.61	0.40	0.28	0.30	0.22	0.25	0.22	0.20	0.25	0.25	0.271	0.25	0.24	0.30	0.26	0.60	0.36	0.60	0.57	<b>4.75</b>	<b>4.48</b>
Visol Petroleum Georgia	0.55	0.7	0.55	0.80	0.50	0.71	0.40	0.33	0.25	0.26	0.20	0.24	0.20	0.25	0.25	0.245	0.25	0.27	0.25	0.30	0.30	0.51	0.45	0.78	<b>4.15</b>	<b>5.44</b>
Sokar Georgia gaz	7.60	8.9	7.00	9.55	6.50	8.77	5.00	4.09	3.00	2.38	1.50	1.78	1.50	1.96	2.00	2.021	2.00	2.04	3.20	2.67	5.60	5.88	7.60	10.78	<b>52.50</b>	<b>60.78</b>
<b>Commercial</b>	49.80	69.18	46.30	62.96	46.30	69.00	44.30	48.67	42.80	52.80	45.00	52.49	32.00	56.71	43.50	58.18	44.50	60.28	45.50	61.25	46.50	68.75	51.00	78.02	<b>537.50</b>	<b>738.30</b>
Karat+	21.00	23.91	19.00	15.11	20.00	24.16	20.00	22.87	20.00	21.77	20.00	22.31	10.00	22.34	20.00	22.24	20.00	22.11	21.00	23.27	21.00	21.66	21.00	23.74	<b>233.00</b>	<b>265.49</b>
Kaztransgaz-Tbilisi	13.00	19.67	11.00	20.19	9.00	16.39	7.00	4.12	4.00	6.20	4.00	6.11	4.00	6.26	4.00	6.53	5.00	7.70	6.00	8.02	7.00	16.46	11.00	20.81	<b>85.00</b>	<b>138.47</b>
Georgian International Energy	3.00	6.15	3.00	5.89	4.00	5.86	5.00	4.63	7.00	4.97	9.00	5.93	6.00	5.60	5.00	5.71	5.00	5.71	5.00	5.56	5.00	5.83	5.00	5.82	<b>62.00</b>	<b>67.64</b>
Itera Georgia	7.00	10.45	7.00	11.93	7.00	14.83	7.00	9.79	7.00	10.12	7.00	10.01	7.00	11.53	7.00	12.26	7.00	12.28	7.00	12.64	7.00	12.13	7.00	14.13	<b>84.00</b>	<b>142.09</b>
sokar Georgia gaz	2.50	2.97	2.50	3.21	2.50	3.03	1.50	1.06	1.00	0.99	1.00	1.05	1.00	1.15	1.50	1.13	1.50	1.50	1.50	1.30	1.50	2.64	2.00	5.08	<b>20.00</b>	<b>25.12</b>
power enerji	2.50	4.51	3.00	5.16	3.00	3.07	3.00	4.55	3.00	7.01	3.00	5.12	3.00	7.59	5.00	7.77	5.00	8.39	4.00	8.10	4.00	7.72	4.00	5.89	<b>42.50</b>	<b>74.86</b>
visol petroleum Georgia	0.80	1.53	0.80	1.47	0.80	1.67	0.80	1.64	0.80	1.74	1.00	1.97	1.00	2.23	1.00	2.54	1.00	2.59	1.00	2.36	1.00	2.32	1.00	2.56	<b>11.00</b>	<b>24.63</b>
Transportation losses	1.00	-3.97	1.00	-5.09	1.00	-4.83	1.00	-0.74	1.00	0.18	1.00	-0.27	1.00	-0.52	1.00	-1.63	1.00	-4.01	1.00	-4.55	1.00	-4.85	1.00	-5.52	<b>12.00</b>	<b>-35.81</b>
<b>Total Demand</b>	224.55	260.93	208.35	269.87	199.80	272.27	130.60	108.23	64.35	72.39	59.95	69.76	45.40	74.55	56.50	95.45	79.00	146.20	92.00	165.05	127.50	178.19	186.15	255.63	<b>1474.15</b>	<b>1968.50</b>
<b>Azerbaijan (Saxdenizi)</b>	189.05	81.24	175.85	74.21	164.30	91.38	126.10	72.08	59.85	71.16	55.45	60.88	40.90	68.15	52.00	13.59	74.50	13.94	71.50	39.75	103.00	55.07	150.65	75.98	<b>1263.15</b>	<b>717.41</b>
<b>Russia</b>	35.50	29.97	32.50	91.35	35.50	30.59	4.50	0.10	4.50	0.36	4.50	1.93	4.50	2.30	4.50	3.96	4.50	2.28	20.50	2.67	24.50	10.52	35.50	27.96	<b>211.00</b>	<b>203.97</b>
<b>Local</b>	1.00	0.52	1.00	0.53	1.00	0.56	1.00	0.40	1.00	0.36	1.00	0.36	1.00	0.43	1.00	0.46	1.00	0.50	1.00	0.46	1.00	0.38	1.00	0.23	<b>12.00</b>	<b>5.19</b>
sokar		144.69		99.78		139.77		32.58		0.00		1.21		0.00		75.92		126.12		117.82		108.98		146.12	<b>0.00</b>	<b>992.99</b>
<b>Total Supply</b>	225.55	256.43	209.35	265.88	200.80	262.30	131.60	105.15	65.35	71.87	60.95	64.38	46.40	70.87	57.50	93.93	80.00	142.84	93.00	160.70	128.50	174.94	187.15	250.28	<b>1486.15</b>	<b>1919.56</b>

## 10.0 ANNEX 2 NATURAL GAS CHARACTERISTICS

### 1. Natural Gas from Azerbaijan

Characteristics (gas content and heat content):

From SCP Pipeline:

	Gas component content mol. %									Density kg/cm	Heat content	
	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	CO2	Nitrogen		k.joul/cm	k.kal/cm
2011	94.64 10	3.15 72	1.12 18	0.25 26	0.25 29	0.11 40	0.11 40	0.19 92	0.14 75	0.7171	35384 .4	8451 .4
2012	94.58 66	3.17 85	1.15 80	0.21 31	0.29 22	0.08 36	0.06 56	0.20 77	0.20 24	0.7169	35211 .7	8409 .8

From Azerbaijan Gas Main System:

Annual Average	Gas component content mol. %										Density kg/cm	Heat content	
	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	N-Hexane	CO2	Nitrogen		k.joul/cm	k.kal/cm
2011	90.2 884	4.01 10	2.08 97	0.34 76	0.51 00	0.10 84	0.08 36	0.01 32	2.37 40	0.14 22	0.764 9	3554 3.2	849 6.0
2012	91.7 102	3.81 65	1.83 38	0.31 91	0.47 53	0.10 74	0.08 12	0.01 21	1.46 31	0.18 11	0.748 9	3557 7.8	849 7.2

### 2. Natural Gas from Russia:

Characteristics (gas content and heat content):

	Gas component content mol. %										Density kg/cm	Heat content	
	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	N-Hexane	CO2	Nitrogen		k.joul/cm	k.kal/cm
2011	92.7 172	4.04 06	0.85 72	0.09 76	0.12 74	0.03 43	0.02 89	0.00 86	0.70 26	1.38 55	0.723 3	3441 0.8	821 8.5
2012	92.7 127	4.03 81	0.87 61	0.09 47	0.11 37	0.03 07	0.02 58	0.00 78	0.78 92	1.31 12	0.723 1	3440 3.4	821 6.8

## 11.0 ANNEX 3 LIST OF KEY NATURAL GAS SECTOR LEGAL DOCUMENTS

	Legislation in Gas Sector	Scope
1.	Law of Georgia on Electricity and Natural Gas	This Law regulates activities and relations of individual entrepreneurs, physical and legal persons in the areas of natural gas supply, import, export, transportation, distribution and consumption and maintenance of the functioning and development of the natural gas sectors in Georgia.
2.	Law of Georgia on Oil and Gas	<p>The Law is aimed at:</p> <ul style="list-style-type: none"> <li>a) Creation of the uniform legal basis of development of oil and gas resources and oil refining, gas treatment or transport activity and implementation of the single state policy in the field of development of oil and gas resources and oil refining, gas treatment or transport activity;</li> <li>b) Promotion of investments in the Georgian oil and gas sector and protection of legal interests of entities participating in oil and gas operations;</li> <li>c) Creation of an effective legal base for state regulation, supervision and control of oil and gas operations, oil refining, gas treatment or/and transportation activity in Georgia, establishment of the relevant regulatory authority – a legal entity under public law;</li> <li>d) Determination of general principles of contracts on oil and gas prospecting and production between the state and investor;</li> <li>e) Determination of functions of the National Oil Company of Georgia;</li> <li>F) Unification of the authority of government regulation of oil and gas operations, oil refining, gas treatment</li> </ul>

		or/and transportation activity in Georgia into one regulatory body and formulation of its main functions.
3.	Order of Minister of Energy on Gas Market Rules	The Ministry, under its own administrative-normative act, approves the following documents:  a) Natural Gas Balance;  b) Natural Gas Market Rules;
4.	GNERC Resolution Concerning the Approval of Rules on Supply and Consumption of Natural Gas	The Commission-granted natural gas distribution license shall authorize a legal entity to operate the distribution network, distribute and deliver natural gas within a specific distribution network
5.	GNERC Resolution Concerning the Approval of Rule Calculation of Normative Loss Volume Natural Gas Distribution in Network	The Natural Gas Distribution Network and Establishing Procedures for Calculating the Amount of Normative Losses
6.	GNERC Resolution Concerning the Approval of Rule on Calculation of Regulation Fee in Electricity, Natural Gas and Water Supply Sectors	The Commission shall, by resolution, approve its charter, rules and procedures of proceedings, procedural rules for consideration of disputes, the amount of regulatory fee and calculation methodology of regulatory fee, licensing rules, delivery and consumption rules, tariff methodology, tariff including marginal), amount of normative losses and rules for their calculation.
7.	GNERC Resolution Concerning the Approval of Rules on Control of Activity and Licensing in Electricity, Natural Gas and Water Supply Sector	The Commission shall be authorized to grant licenses and regulate activities of licensees, importers, exporters, suppliers within the natural gas sector of Georgia.
8.	Order of the Ministry of Energy on Deregulation and Partial Deregulation of Natural Gas Supply	1. Natural gas supply activities, except for the cases provided for in paragraph 2 of this Order, as the deregulated. 2. Partially deregulated to the natural gas supply in 2008 before August 1 of the Natural Gas Users of individuals (population - household members) that natural gas will not consume entrepreneurial activities, except those for which the natural gas supply in deregulated in 2008 till August 1.

9.	GNERC Resolution Concerning the Approval of Natural Gas tariffs	<p>Regulatory Commission on August 14, 2003 resolution of the N13, (Article I, Section 3), "Georgian Gas Transportation Companies' proven natural gas transportation tariffs</p> <p>Without value added tax, Gel / 1000 cubic meters. Meters: (16.10.2007 N18)</p> <p>A. For thermal power plants, 9,0</p> <p>B.a. "KartliGasfor": Seal Former JSC "Kazbegigazis" users, 9,0</p> <p>B.b. Former JSC "Dushetigazis" users, 11.67</p> <p>G. The remaining members _ 13.83</p>
10.	Natural Gas Tariff Setting Rules and Methodology	<p>The basis for the development of the natural gas tariff methodology is the existing legislation, Georgian Law on Electricity and Natural Gas, Decisions And Resolutions of the GNERC.</p>

## 12.0 ANNEX 4 TARIFFS THE NATURAL GAS SECTOR

Excerpt from: **Georgian National Energy Regulatory Commission, Resolution #30, dated December 30, 2005, Tbilisi, and On Natural Gas Tariffs.**

“Owing to sharp tariff increase of the natural gas imported from Russian Federation to Georgia since January 1, 2006, officially executed in the last decade of December 2005, called for prompt recalculation of the whole system of natural gas tariffs and required taking additional measures from the Government for increasing social security of the population in January-April 2006. According to the above mentioned and Articles 4,5, 42 and 43 of the Georgian Law “On Electricity and Natural Gas” and “Natural Gas Tariff Setting Rules and Methodology” approved by GNERC Resolution # 6 of September 8, 1999, GNERC resolved:

Article 1 Removed (10.10.2007 #16)

Article 2 Natural gas transportation tariff excluding VAT, GEL/1000cubic meter for “Georgian Gas Transportation Company” LLC approved by GNERC Resolution #13 of August 14, 2003: (16.10.2007 #18) shall remain unchanged:

- a. For thermal power plants - 9.0
- b. For “Kartligazi” LLC:
  - Former JSC “Khazbegigazi” customers - 9.0
  - Former JSC “Dushetigazi” customers- 11.67
- c. For the rest of the customers - 13.83

Article 3 Removed (14.07. 2006 #24)

Article 4 Natural gas delivery, distribution and consumption tariffs excluding VAT, GEL/1000 cubic meter for retail customers shall be approved per gas distribution companies (30.12.2010 #30).”

## **13.0 ANNEX 5 TARIFF METHODOLOGY**

### **Chapter1**

#### **General Provisions**

##### **Clause 1 Objective of the Document**

1. The objective of this document is to determine rules and methodology for setting natural gas supply, transportation and distribution tariffs according to the Georgian Law on Natural Gas and Electricity.
2. The Tariff Methodology (hereinafter Methodology) takes into account the present organizational, technical, economic and financial situation of the Georgian Natural Gas Sector and insures reflection of economically prudent costs of transportation, distribution and supply of natural gas in tariffs.

##### **Clause 2 Applicability of the Methodology**

1. The Methodology applies to the natural gas supply, transportation, distribution and consumption spheres. It ensures functioning and development of the natural gas sector according to the market economy principle.
2. The Methodology does not apply to the exploration, production, refining and storage of natural gas, relations between natural gas producers and supply licensees, as well as transit of natural gas through the territory of Georgia;
3. Licensees’ service territories and applicability of corresponding tariffs are determined by GNERC.



### Clause 3 Definition of Terms

Terms used in present methodology have the following meaning:

- a. "Distribution Network"—Gas supply system of cities and/or residential areas including 1.2 - 0.6 - 0.3 - 0.005 MPa pressure lines;
- b. "Distribution License" shall mean a License granted by the Commission to receive natural gas from one or more sources, to operate a distribution network and to distribute natural gas within a defined geographic or certain distribution area based on the authorization granted by the supply licensee;
- c. "Distribution Tariff"—price of service provided by the distribution licensee to the customers;
- d. "Losses" – difference between received and delivered volumes of gas excluding gas used for own consumption;
- e. "Supply License" - shall mean a License granted by the Commission to acquire and/or sell volumes of natural gas to other Natural Gas Supply Licensees or other customers;
- f. "Supply Tariff" – price of service provided by the supply licensee to the customer;
- g. "Consumer"—legal or natural person, consuming natural gas for its own purposes and is not engaged in reselling of natural gas;
- h. "Transportation License"—License granted by the Commission to operate transportation facilities, receive natural gas from one or more receiving points and to transport natural gas to one or more delivery points;
- i. "Tariffs"—price system applied to the settlement of natural gas costs at each stage of supply, transportation and distribution.
- j. "Transportation Network" shall mean all pipelines, compressor stations, metering stations and other related facilities which are used for transportation of natural gas; operate, or are designed to operate, at or above 1.2 MPa pressure; connect receiving points and delivery points; and are owned or managed, and/or operated by a Transportation Licensee.
- k. "Tax" - obligatory payment to the central and local budgets or special State Funds paid by taxpayer, having an obligatory, non-quid-pro-quo, and gratuitous nature;

- l. "Gas Distribution Station"—complex of gas line facilities designed for reduction of gas pressure, purification, odorizing and accounting of costs prior to delivery to the customers;
- m. "Gas regulatory station"— distribution facility that reduces pressure of gas received from high or medium pressure lines to medium or low pressure and delivers correspondingly to the medium or low pressure lines;
- n. "Low pressure line"— distribution line of up to 0.005MP a pressure
- o. "ValueAddedTax"("VAT")—indirect tax, an obligatory paymenttothebudget of a portion of the value added in the process of the productionandcirculation ofgoods,works,andservicesontheterritory of Georgia, and of a portion of the value of all taxable goods imported onto the territory of Georgia;
- p. "Licensee"-legal or natural person, which holds a license for specific activity during specific period, issued by the Georgian National Energy Regulatory Commission according the Georgian Law on Electricity and Natural Gas;
- q. "Annual Revenue Requirement of the Licensee" - total amount of projected revenue for 12 months, required to cover all service related costs of the licensee and to provide a reasonable profit;
- r. "High Pressure line" – distribution line of 0.3 - 1.2 MPa pressure;
- s. "Profit" - difference between the revenue from the sales of natural gas and the expenses for providing services and sales of the gas.
- t. "Direct Customer"—person receiving natural gas directly from the transportation system and is not a distribution licensee;
- u. "Regulatory Fee" - amount which shall be paid annually by the natural gas supply, transportation and distribution licensees to cover expenses related to the regulatory services provided by the GNERC;
- v. "Metering Station" – point for the metering of gas consumption;
- w. "Compressing Station"— line facilities designed for compression of gas;
- x. "MediumPressureLine"—distribution network line of 0.005 - 0.3MPa pressure;
- y. "GNERC"- Georgian National Energy Regulatory Commission.

## Chapter II

### Methodological Basis and the Main Principles of Tariff Setting

#### Clause 4 Methodological Basis

1. The basis for the development of the natural gas tariff methodology is the existing legislation, Georgian Law on Electricity and Natural Gas, Decisions and Resolutions of the GNERC.
2. Natural gas tariffs shall be determined on the basis of interests of supply, transportation, distribution entities and customers. Competitive tariffs shall encourage efficient use, a favorable combination and rationalization of energy balance.
3. The methodology is based on the principle of recovery of reasonable costs for natural gas supply, transportation and distribution; interests of financial stabilization and in order to improve the investment environment, tariffs shall encourage effective use of operating assets according to the actual load.
4. According to the present methodology, natural gas tariffs are determined separately for each licensee.
5. In order to determine natural gas supply tariffs, methodology involves providing information on volume of gas to be supplied, amount of taxes, purchase price of gas etc.
6. In case of necessity amendments to the methodology or termination of the methodology will be accomplished according to the rules set by the GNERC in accordance with the legislation.

#### Clause 5 Main Principles

1. The main principles of the tariff methodology are to increase efficiency in consumption of natural gas, to encourage its use as an alternative fuel, to rehabilitate the gas industry and attract local and foreign investments for the purpose of its development and encourage competition.
2. Tariffs established according to this methodology shall:
  - a) Protect consumers and/or other licensees from misapplication of monopolistic power by the monopolistic licensee;

- b) Provide Licensees with an opportunity to recover their reasonable costs and provide a reasonable return on investment;
  - c) Encourage financial stabilization of the licensee that is essential for the increase of efficiency of operations and of infrastructure and improve quality of service provided to the customers;
  - d) Be favorable for all categories of customers, encourage consumption of natural gas in production processes as well as for residential purposes;
  - e) Give an opportunity to licensees to recover their economically prudent costs, including costs related to regulatory fees;
  - f) None of the customer categories shall receive a discount tariff subsidized by another customer category or licensee; tariffs shall reflect cost differences between different spheres of consumption.
3. The Methodology considers the value of operating fixed assets that will allow investor to receive a reasonable return on invested equity.
4. For calculation of return on assets, the Methodology takes into account a risk factor related to the investment. Therefore the return on assets shall be higher than the corresponding bank interest rate.
5. All decisions and resolutions of the GNERC, concerning tariff setting are available for public discussion.

## **Chapter III**

### **Cost of Service Components**

#### **Clause 6 Recoverable Costs and Taxes**

- 1) The cost of supply, transportation and distribution services includes expenses related to the gross revenue, taxes and profit. GNERC will allow licensees to recover prudently incurred costs related to their licensed activity.
- 2) Cost of service components are calculated according to the following calculation clauses (excluding price of natural gas):
  - a) Commodity;
  - b) Spare parts and supplies;

- c) Operating and maintenance expenses including services of third parties (repair and other work);
- d) Fuel for compressing stations;
- e) Fuel for heating of the buildings;
- f) Electricity for electrochemical protection of lines;
- g) Electricity, thermal energy and water for operational needs;
- h) Maintenance of machinery;
- j) Depreciation expenses as determined in the Georgian tax code;
- k) Other not specified expenses including operating lease expenses, loan interest expenses, etc. (below 10% of total expenses).

### **Clause 7 Depreciation Expenses**

For tariff setting purposes depreciation amount of the operation cost is determined according to the norms set by the Tax Code of Georgia.

### **Clause 8 Maintenance Expenses**

The Methodology specifies that natural gas tariffs shall separately reflect maintenance expenses that will be calculated according to the Georgian Tax Code.

### **Clause 9 Taxes**

Natural gas tariffs shall reflect all including profit tax and VAT.

During tariff setting, it shall be taken into account that after tax profit calculated using revenues and allowable expenses shall comply with the investor's requirement so return on investment.

Value Added Tax (VAT) is payable on every stage of delivery of goods, work and services and is included in the Tariff. Amount of VAT is determined according to the Georgian Tax Code.

### **Clause 10 Loans (Debts)**

Interest on short term debt shall be considered in the operational expenses, but

such expenses should not exceed norms set by the tax code of Georgia. Interest on long-term debt shall be included in the expenses similarly as interest on short-term debt.

### **Clause 11 Return on Assets**

1. Return on assets, which are the weighted average of return on equity and loan interest rate, shall correspond to the risk related to the investment and be included in the tariff.
2. Return on assets is determined by the GNERC separately for individual licensees.

### **Clause 12 Incentive Regulation**

1. To improve the efficiency of the gas sector, GNERC is eligible to use appropriate forms of incentive regulation. Such as the following: retain saving due to the reduction of losses for the use by the enterprise for certain period.

## **Chapter IV**

### **Calculation of Natural Gas Tariffs**

#### **Clause 13 Unbundled Tariffs**

Different tariffs are set for the different operations within the gas industry of Georgia; tariffs for supply, for transportation and for distribution of natural gas. It is possible to introduce additional unbundled tariffs in the future.

#### **Clause 14 Supply Tariff**

The basis for the calculation of the supply tariff is economically reasonable cost for the purchase of natural gas plus reasonable costs of the licensee including all types of taxes other than VAT. Cost of service calculated this way, profit according to the norms determined by the GNERC and VAT at the rate determined by the Tax Code is summed. Such aggregate is divided by the forecasted volume of natural gas supplied by the licensee. The result is the supply tariff in Lari/1000m<sup>3</sup>.

#### **Clause 15 Transportation Tariff**

Calculation of transportation tariff is based on the prudently incurred costs of the transportation licensee, including all types of taxes other than VAT. This cost, return on assets and VAT are then summed and divided by the forecasted amount

of transported natural gas, including normative losses. The result is the transportation tariff in Lari/1000m<sup>3</sup>.

### **Clause 16 Direct Customer Tariff**

Purchase price of natural gas for the direct customer equals to the sum of the supply and transportation tariffs. Purchase price of the natural gas shall include reasonable level of losses.

### **Clause 17 Distribution Tariff**

The natural gas distribution tariff is calculated similarly to the transportation tariff. The distribution licensee supplies natural gas to the three groups of customers (industrial customers, public utilities and residential customers). Therefore it is essential to allocate distribution costs to different groups of customers. This shall be done in proportion with the value of operating assets necessary to serve particular group of customers. Value of operating assets is divided in proportion with the volume of consumed natural gas.

### **Clause 18 Retail Tariffs by Customer Groups**

Customer tariffs shall reflect the full cost of natural gas consumed by the particular group of customers, that include supply, transportation and distribution tariffs.

### **Clause 19 Tariff Adjustments**

1) Exchange rate adjustments:

Calculation of revenue and expenses are conducted in the national currency – Lari. Settlement with foreign countries for supplied natural gas will be conducted in hard currency as well. Therefore, exchange rate changes would affect natural gas tariffs. For tariff adjustment purposes, settlement level will be defined using the average index set by the National Bank of Georgia for the period. Tariff adjustment to the exchange rate is implemented twice a year (April and October) if the change exceeds 15%. Consistent application shall be submitted by the Licensee to the GNERC. The decision shall be made within one month after submission of the application.

2) Adjustments to Gas Price Variations

In the case when the gas price variations exceed 15%, tariffs shall be subjected to the corresponding adjustment.

## **Clause 20 Transit Fee**

According to the Georgian “Law about Electricity and Natural Gas”, gas transit tariffs are not subject to regulation by the GNERC and are determined through negotiation between interested parties.

## **Clause 21 Data Collection**

1. GNERC will design a uniform data collection form necessary to meet its regulatory obligations. All licensees shall be required to provide GNERC with the requested data in accordance with the set rules and in a timely manner.
2. If requested by the Licensee, the GNERC ensures confidentiality of the provided information.

## **Chapter V**

### **Tariff Setting Rules and Procedures**

## **Clause 22 Tariff Setting Conditions and Principles**

1. Tariff setting rules and procedures define the necessary requirements, according which all the tariff applications for direct consumers and licensees of the gas sector shall be prepared.
2. Tariffs set by the GNERC are obligatory for all licensees and customers.
3. Tariff applications shall include the following information: name of the applicant, type of service, address, form of ownership, bank requisites (name of the bank, address, account number and code), name of the manager of the applying enterprise, telephone number.

Technical-economic justification of the forecasted costs and annual balance sheet accompanied with appropriate attachments shall be presented according to the forms developed by the GNERC.

4. Each tariff application shall be designed by a manager of the enterprise.

Licensee is responsible for timely submission of the information. The signer is responsible for the accuracy of submitted information.

## **Clause 23 Tariff Setting Procedures**



1. GNERC will review submitted tariff applications and, within one month, either accept the application as submitted, or consider it incomplete and return to the licensee for appropriate corrections. In any of these cases licensee will be notified in written form.
2. When GNERC accepts an application as complete, it will give public notice that will give an opportunity to all interested parties to get familiar with submitted information during regular business hours and submit comments to the GNERC as specified in the existing rules.
3. Comments on a tariff application may consist of statements of facts, arguments, or evidence. Comments may support or oppose the tariff request. The party submitting the comments shall deliver a copy of the comments to the licensee that requested the tariff. The licensee may respond to the comments within 15 days and if necessary, request appropriate clarification from the opponent.
4. GNERC shall within 1.5 months, after an application is received, consider it and make one of the following decisions:
  - a. Satisfy a request and set a tariff;
  - b. Postpone the review of application until the information is received.
5. If the tariff satisfies requirements of the GNERC, it shall become effective in the time period determined by the GNERC but no later than 150 days after submission of tariff application.
6. In special cases, GNERC, in agreement with the applicant, may postpone a deadline for consideration of the application.
7. GNERC shall give an advance notice of 5 days to an applicant, concerning the day of request consideration, in order to allow an applicant to attend the meeting.
8. GNERC, in the process of tariff setting, accepts comments that are provided as official information or as a notice made during the hearing.
9. The Licensee, and other interested parties have a right to apply to GNERC for changing of GNERC's decision due to the following concerns:
  - a. Inaccuracy of facts and data included in the decision;
  - b. Inconsistency of the decision with the existing laws and regulations;

10. GNERC will within ten days give public notice of the decision that will enable interested parties to get familiar with the determined tariff.

11. Licensee, customer or other interested parties have a right to appeal the decision of the GNERC according to these procedures.

### Clause 24 Tariff Setting Fee

1. Tariff setting fee shall be determined by the GNERC and shall be paid by the applicant within two weeks after submission of the application.

2. Cost of Tariff setting as determined by the GNERC shall be included in the tariff; Cost of tariff setting services is covered by the applicant.

## 14.0 ANNEX 6 GASIFICATION PLAN FOR 2013-2014

### Gasification Work (Number of Users/Households)

	Plan 2013	Plan 2014	Work completed by 1 November 2013 (including unplanned settlements)	Ongoing work (including those to be completed in 2014)
Autonomous Republic of Ajara	2,450	-	2,450	-
Guria	1,130	3,415	443	1,761
Imereti	20,819	4,609	7,784	19,519
Racha-Lechkhumi and Lower Svaneti	-	-	300	-
Kakheti	8,761	-	4,315	17,515
Mtskheta-Mtianeti	3,671		1,827	2,064
Samegrelo-Upper Svaneti	11,420	5,857	3,940	8,614
Samtskhe-Javakheti	4,976	2,988	3,986	1,528
Lower Kartli	9,868	-	5,138	2,311
Inner Kartli	2,306	4,283	926	1,322
<b>Total</b>	<b>65,401</b>	<b>21,152</b>	<b>31,109</b>	<b>54,634</b>

**Source:** Ministry of Energy, Georgia

## 15.0 REFERENCES

1. The prospectus of GOGC, issued in May, 2012;
2. EIA Report 2011;
3. Law of Georgia on Electricity and Natural Gas;

4. Law of Georgia on Oil and Gas;
5. Order of Minister of Energy on Gas Market Rules;
6. GNERC Resolution Concerning the Approval of Rules on Supply and Consumption of Natural Gas;
7. GNERC Resolution Concerning the Approval of Rule Calculation of Normative Loss Volume Natural Gas Distribution in Network;
8. GNERC Resolution Concerning the Approval of Rule on Calculation of Regulation Fee in Electricity, Natural Gas and Water Supply Sectors;
9. GNERC Resolution Concerning the Approval of Rules on Control of Activity and Licensing in Electricity, Natural Gas and Water Supply Sector;
10. Order of the Ministry of Energy on Deregulation and Partial Deregulation of Natural Gas Supply;
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13. [www.gogc.ge](http://www.gogc.ge) (Georgian Oil and Gas Corporation)
14. [www.blakeoilandgas.com](http://www.blakeoilandgas.com) (Blake Oil and Gas)
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16. [www.minenergy.gov.ge](http://www.minenergy.gov.ge) (Ministry of Energy of Georgia)
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**USAID Hydro Power and Energy Planning Project (USAID-HPEP)**

**Deloitte Consulting Overseas Projects - HPEP**

**Tiflis Business Centre, 13<sup>th</sup> Floor**

**11 Apakidze Street**

**Tbilisi, 0171, Georgia**