

Gasification in Georgian Agriculture Sector

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Abstract

The article provides a brief retrospective analysis of the level and dynamics of Georgia's gasification from the beginning of the process up to today. It is said that the production and consumption of gas per inhabitant throughout the country reached its maximum in 1989. As for these indicators in agriculture, it is far worse. However, it is noteworthy that in the last years of the country's independence the situation has been improved. The research has been provided throughout the country as well as in agriculture. The article provides suggestions for improvement of the situation. Namely to increase the level of gasification.

Keywords: Agriculture; Gasification; Energy Balance; Energy Resources; Electricity Balance

Introduction

Power engineering is the most important basis for the developing of any country whereas the level and dynamics of energy consumption and production per inhabitant is as objective and adequate parameter to characterize economic development as the Gross National Product.

Power engineering plays a leading role in economics because any process of manufacturing in all subfields of industry, agriculture, transport, all areas of population service and so on, is related to using more and more energy. Energy equipment is a fundamental material basis for the growth of productivity of social work. The development level of power engineering greatly influences the progress of dynamics and arrangement of industrial production across the country. It creates essential preconditions for raising living standards and improving labor conditions. Also, it is a ground for developing of all fields, including agriculture as well.

Evolution of Current Condition

Gasification means the unity of maintenance and technical and design solutions implementation,

construction and repair works as well as organizational activities that are aimed at moving the housing and communal facilities to the consumption of gas as the fuel and energy resource all over the country.

Gasification works in Georgia commenced in 1956. At the end of 1959, Tbilisi was supplied with gas from the Republic of Azerbaijan [1]. Annual capacity of the main gas pipeline was 1,8 billion m³ which, as a result of the reconstruction, achieved 4,6 m³. From the very beginning, gasification of the country developed very rapidly due to which the capacity of the existing gas pipeline as well as the gas resources became insufficient [2]. It was necessary to find new sources. Vladikavkaz-Tbilisi gas pipeline was constructed and put into the operation from 1963. Over 1970-1978 Georgia was supplied gas from Iran too [3]. From November 1978, gas supply of Georgia from Iran was seized due to political developments in this country, and it was necessary to reconstruct Vladikavkaz-Tbilisi gas pipeline which commenced in 1985 and terminated in 1991. Annual capacity of the gas pipeline achieved 20 billion m³ due to which South Caucasus countries including Georgia started to receiving the Turkmenistan gas. Within this period, Georgia was one of the leading countries according to the gasification level [4]. 48 cities and 230 villages, up to 600 thousand flats, up

to 800 industrial and agricultural plants, 1500 thermal power supply boilers, 2 thousand housing and communal facilities were gasified [3]. 10 thousand km gas pipeline including 2 thousand km main gas pipeline and 8 thousand km distribution network were constructed [5].

In 1989 gas consumption in Georgia exceeded 6,0 billion m³, and made up 60% of the country's fuel balance. Natural gas was made available to almost every region of

the country (except for the mountainous Svaneti and Achara). In 1990, the consumption of natural gas in Georgia reached its maximum – 6046 million m³ [6]. By this time, there were 576,5 thousand flats gasified in the country and the length of the gas pipelines was 4802,8 km. In 1990, the country's gas consumption gradually reduced and by the year 2000 it dropped down to 1094 million m³, i.e. it reduced 5,5 times compared to the year 1990 (please see Table 1 below).

Year	Amount of gasified flats (thousand)	Gas pipeline length (km)	Consumption of natural gas (mln m ³)	Including agriculture
1990	576,5	4802,8	6046,0	180
1991	579,8	4937,8	4577,1	176
1992	587,2	4962,1	4633,7	49,6
1993	587,2	5158,4	3343,7	-
1994	587,4	5158,4	2595,2	-
1995	587,4	5158,4	910,5	-
1996	587,4	5151,9	947,0	12,4
1997	587,4	5151,9	830,0	13,6
1998	587,4	5151,9	846,0	14,9
1999	587,4	5151,9	1022,0	23,5
2000	587,4	5151,9	1094,0	26

Table 1: Gasification Values of Georgia over 1990-2000 (by the year end) [7-9].

The well-known developments of the past years had very negative impact on the gas plants. The country's gas supply stopped for a long time, gas was not supplied to Tbilisi as well as the entire Georgia (except Rustavi and Kazbegi region) during the entire 1995 and first half of 1996.

Within this period, Georgia's gasification level could not be improved due to the following issues:

Hard financial situation. No industrial enterprises were operating due to which the natural gas farms, in the environment of non-payment and low consumption, had very low revenues. There was not a single gas farm that had no debts (from several thousands to millions of GEL); Due to little volume of sold gas, gas cost was high as only small part of the network was functioning; however, depreciation and other taxes were fully charged;

1. Physical losses of gas were high and its percentage rate was high too. Gas overconsumption by the residents (commercial losses) was added to the losses caused by the technical issues during the non-meter period, especially in winter;
2. Certain part of the residents had no money to install gas meters (approximately 100 USD);

3. Business plans could not be drafted and this made it difficult to attract investors [7].

Georgian gas supply was unstable over the following years too. It would even reduce during several years (see Table 2 below).

Year	Million m ³	Year	Million m ³	Year	Million m ³
2000	1094	2006	1860	2012	1933
2001	880	2007	1684	2013	1907
2002	700	2008	1450	2014	2197
2003	1011	2009	1200	2015	2416
2004	1231	2010	1094	2016	2261
2005	1440	2011	1750	2017	2300

Table 2: Natural Gas Supply in Georgia over 2000-2017 [10].

Until recently, the gasification of the villages in the country was conducted slowly. At present, this process is rather intensive. Major source of natural gas for Georgia now is Azerbaijan. So far the local production is still insignificant – only 0.3% of the total consumption. Both in villages and cities the consumption of the natural gas increases in the household sector. At the end of 2016, the

amount of the consumers of this energy source exceeded a million (1055600) out of which 96.7% comes on the household [11]. Significant share in this number comes on villagers. In 2016, the average amount of natural gas consumed by one household consumer was 773 m³. This value is 4.5% more than the value recorded in 2014. The increase is observed in Tbilisi too, and for the household consumers of the rest of Georgia, constant increase of the volume of the natural gas consumed by an individual subscriber indicates the increase of the role of the natural gas in the household sector. In the environment when it is more and more difficult to obtain wood in the country and its price increases respectively, natural gas is the most accessible (financially and in terms of the access to the energy) energy source in the environment of mass gasification of Georgian villages.

According to the aggregated energy balance of Georgia, natural gas consumption in agriculture, forestry and fishing amounted to 8,8 thousand tons of conventional fuels in 2016 which is 2,5 times higher than the same index in 2015. Now in this field the total cost of natural gas in the country is 0.656% (in 2015 – 0,256%).

Conclusion

Energy development in Georgia is characterized by unsteady successes. Over the last 100 years (1913-2016) the manufacture of electricity has increased 568,3 times and the natural gas consumption has increased 5,0 times since the assimilation of it up to today (1960-2016). It is noteworthy that the maximum for both of them were achieved in 1989. Comparing the level of 2016, it was more than 39,2% in electricity manufacture and 2,7 times more in natural gas consumption. There is approximately the same trend in separate sectors in the use of these energy sources, including agriculture, which is traditionally characterized by low power equipment.

Analysis shows that in order to improve the situation in the future, it is necessary to take into account the characteristic specificity of both fields (energy and agriculture). For energy to work out successfully, the intensive and continuous funding is necessary in order to maintain the functioning capacity and at the same time to achieve progress in accordance with the Macroeconomic Environmental Requirements. It is necessary to attract a significant number of additional investments. This as a result of joint influence of other objective factors (ecological requirements, the need for more

expensive energy resources, etc.), in the first place the capitalization of the sector and overall significance increase.

Also the peculiarities of Georgian agriculture electrification and gasification should be taken into consideration. First of all, here we assumed the country's mountainous relief, climate, seasonality, the existence of small settlements far away from the centre, still high-handed labor, still remaining high share of manual labor and so on.

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