



Annals of Agrarian Science

Journal homepage: <http://journals.org.ge/index.php>



Synthetic analysis of energy tariffs and conceptual bases for its change (on example of Georgia)

D. Chomakhidze*

Georgian Technical University; 77, Kostava Str. Tbilisi, 0160 Georgia

Received: 29 January 2021; accepted: 10 February 2021

ABSTRACT

The article describes the factors affecting energy tariffs that lead to its change. These include globalization, the existence and utilization of natural energy resources in the country, energy balance, energy efficiency, the role of society in energy development, etc. The peculiarities and principles of the field are mentioned in this regard, first of all, the need to utilize increasingly expensive energy resources and the need to take into account environmental requirements. According to the author, in order not to increase tariffs, we must achieve the introduction of scientific-technological and managerial progress in the field at a faster pace than the deterioration of natural conditions and other negative challenges.

Keywords: Georgia, Tariff, Energy, Technical Progress, Management Electrical Balance.

*Corresponding author: Demuri Chomakhidze; E-mail address: demurchomakhidze@yahoo.com

Introduction

Georgia has long linked its destiny to a market economy. The transition to a new way of life has created many problems in the country. Among them were energy challenges and, above all, tariffs. Added to these and other negative developments was the occupation of 20% of the territory. Despite international outcry, the country found itself in dire straits. This can be clearly seen from the data below [1].

General information about Georgia:

1. Georgia is located in the South Caucasus, on the crossroad of eastern Europe and western Asia
2. Total area is 69 700 km². 20% out of total area is occupied by Russia
3. Population: 3 716 900
4. Capital: Tbilisi
5. Currency: Lari (1 US Dollar=3,30 GEL)
6. GDP: 44599,3
7. Fuel and other energy sources are found in slight amount, though not very rich in this aspect.
8. Rivers hold huge amounts of hydropower, largely compensating fuel shortage of the country.

Currently, resources of technical hydropower is utilized at only 12%

9. Georgia is rich with alternative sources of energy (solar, geothermal, wind, etc.).

This article will play a positive role not only for Georgia, but also for countries in a similar situation.

Basic Part

1. Factors affecting the tariff

Among the many problems facing Georgia today is the issue of secure and sustainable energy supply [2]. We all know that energy is the lifeblood of the economy. The socio-economic development and strength of the country, the well-being of the population, etc. depend on it. We can not achieve economic security without achieving energy security; Moreover, the independence and statehood of the country will be threatened. Particularly noteworthy is the fact that the increase or decrease in energy prices by chain reaction is immediately reflected in

the consumer market. It is therefore not at all surprising that every increase in the consumer tariff on electricity has a severe impact on society. This was also the case at the end of 2020, when a significant increase in tariffs was observed, although for some time it was subsidized for a large part of consumers. This is obviously a heavy burden for our economy [3]

Now there is a question if this decision of the National Energy Regulatory Commission (GNERC) was objective or not. However, I will say from the beginning that both companies and consumers are dissatisfied with this decision. This is the main recognized indicator of the objectivity of the regulatory body in the world. Practically neither side of the regulatory body should be satisfied. After all, he is the defender of justice and universal balance in the field [4].

First of all, about the methodological correctness of the tariff determination. This process is fully based on a methodology recognized by international standards, adapted to local conditions; And statistics on operating and investment costs are audited by relevant experts. Here falsity or human error is virtually ruled out. The calculation is done using modern means. The process will go from a regular employee of the regulatory body to an employee of all levels including senior management. They have a high responsibility before the law and the country. The final decision will be made publicly with the participation of all stakeholders. The tariff is published in the press, and in case of dissatisfaction the party is entitled to apply to the court at all levels, including the Constitutional Court. GNERC had such a precedent in the past [5].

What is the objective environment and operating factors related to energy tariffs in Georgia, which undoubtedly have an impact on determining the level of tariffs.

Globalization. Our country has long been connected to its future market economy and has become a full member of the international community. Here, too, the principle of value is the basis for setting tariffs. It does not take into account whether the country is rich or what the incomes of the population are. Georgia has so far maintained relatively low tariffs. Only in energy-rich countries is it lower than us. In most states, however, it is much higher. According to the results of 2019, our The electricity tariff in the neighborhood was as follows: in Georgia (at white kWh) 18.89; In Azerbaijan - 13.88; In Armenia - 24.69; In Turkey - 27.09; In Russia - 16.34.

Leading European countries: France - 56.44; In Germany - 98.75; In Belgium - 90.79; In Denmark - 95.43. In post-socialist countries: Lithuania - 40.13; In Latvia - 52.09; In Moldova - 29.23; In Estonia - 43.40.

Table. Household electricity tariffs operating in different countries, 2019 [6].

Country	Household tariff (white / kWh)
Azerbaijan	13.88
Ukraine	14.13
Russia	16.34
Georgia	18.89
Serbia	22.58
Armenia	24.69
North Macedonia	25.04
Turkey	27.09
Bosnia and herzegovina	27.92
Moldova	29.93
Bulgary	31.88
Montenegro	33.00
Hungary	35.82
Lietuva	40.13
Malta	41.73
Croatia	42.24
Poland	42.95
Estonia	43.40
Romania	43.43
Island	44.96
Slovakia	50.43
Latvia	52.09
Slovenia	52.25
Greece	52.77
Finland	55.45
Czech Republic	55.90
France	56.44
Luxembourg	57.50
Norway	59.70
Sweden	64.44
Austria	65.05
Netherlands	65.62
UK	67.86
Portugal	68.75
Cyprus	70.45
Italy	73.58
Spain	76.85
Irland	77.49
Belgium	90.79
Denmark	95.43
Germany	98.75

Such are the consequences of globalization. The situation was exacerbated by the events of 2020, primarily the widespread and prolonged spread of the Corona virus. As a result, energy has also become a hostage of medicine. During the first months of the pandemic, companies suffered huge losses. If before the pandemic electricity consumption in Georgia was significantly ahead of production, now the picture has changed, consumption is lagging behind production. This happened both in the capital and in Georgia as a whole [7].

Power generation structure. The impact of this factor on tariffs is well known. The existence of hydro and thermal capacities in the electrical system has its necessity, but also its pros and cons. Construction of hydroelectric power plants requires relatively more time and investment compared to thermal capacities. But due to the need for expensive fuel, the tariff in thermal power plants is 5-6 times higher. Their tariff also includes the so-called "guaranteed capacity" factor in summer. In Georgia, in the conditions of increased electricity consumption during the last 5 years (2015-2019), it became necessary to increase electricity production in thermal power plants from 2378.7 to 2420.2 million. KW. Per hour, ie its share in total output increased from 21.4 to 22.2%. The comparison is especially noticeable compared to 2010. Then the thermal power plants will produce 655.9 million kWh, or 3.7 times less than in 2019. If we add to the above the fact that the increase in electricity imports increased the fact that in 2015-2009 it became necessary to increase imports of imported electricity from 699.3 to 1626.5 million kWh, or 2.3 times, the picture becomes clearer [8].

Deficient energy balance. The energy balance of our country is traditionally deficient. Georgia currently imports about 70% of the energy resources it needs, only 30% of which is locally produced. Natural gas and petroleum products are almost completely imported in the energy balance. In recent years, especially in the autumn-winter period, the electricity balance is also deficient. In 2019, the country imported 1,762.7 million kWh from abroad - about as much as the incomplete Khudoni HPP would generate [9].

Existence and utilization of natural energy resources. Almost all of them are more or less energetic on the territory of Georgia. We are especially rich in hydropower and non-traditional (solar, wind, geothermal) resources. We have coal and oil fields. The first of them is in the region only in Georgia.

As for their assimilation it is unsatisfactory. We use only 10-12% of the technical capacity of hydropower resources and 20-25% of the economically advantageous potential. Oil and coal absorption levels are low. Only at the initial stage is the use of solar and wind yet expensive energy [10].

The role of society. The conscious participation of the community in the development of energy is special. Under the influence of this factor, Khudoni HPP and Namokhvani cascade could not be built in Georgia in recent years. The same picture continues now. If in the past large hydropower plants were targeted, now a certain part of the society is against the construction of hydropower plants of any size and in parallel they are also protesting against the increase of electricity tariffs. We unfortunately have many examples of this [11].

Energy efficiency. The ancient truth is that without an economy, society cannot successfully manage its limited resources. An intensive form of extended reproduction is an organic characteristic of the economic system of a society. It creates objective guidelines for the rational and efficient use of resources to achieve better end results [12].

Although the energy and electricity capacity of products in Georgia has significantly decreased in recent years, this figure is still much higher than in developed countries. According to the latest data, the energy capacity of GDP in Georgia was equal to 0.87 kg. USD, while this parameter was in Germany - 0.03; In Japan - 0.005; In Turkey - 0.029, etc. It turns out that we consume more energy per unit of production than countries rich in energy. Special mention should be made of energy losses In 2019, 155.7 million kWh of energy was lost in the distribution network of "Telasi". In the network of "Energo Pro Georgia" 526.7 million kWh. Therefore, 682.7 million kWh were lost on electricity transportation in both companies. That is almost as much as it was generated in 2019 by such a large HPP as Vartsikhe HPP. (727.3 million kWh) [13].

2. Peculiarities of field development

Tariff change is significantly influenced by the fact that the characteristics of energy are practically taken into account in the development of the sector. In addition to the fact that the production and consumption of electricity coincide in time, this sector is characterized by high intellectual labor capacity and capital capacity among the sectors of the economy. Second, the industry requires intensive and

continuous funding to maintain its ability to function while achieving progress in meeting the needs of the macroeconomic environment. Third, unlike other sectors, energy has a high socio-economic responsibility. Fourth, it as a typical representative of a natural monopoly needs independent regulation. Fifth, it is necessary to attract a significant amount of investment. This is due to the combined influence of other objective factors (ecology, the need to use increasingly expensive energy resources, etc.) to further increase costs, which leads to tariff increases [14].

The role of management in the practical consideration of these features is special. It has been proven that the issue of management is uniquely relevant for energy, which is characterized by a number of features. First, it is characterized by high intellectual labor capacity and capital capacity among the sectors of the economy; Second, the sector requires intensive and continuous funding in order to maintain its ability to function while achieving progress in line with the requirements of the macroeconomic environment; Third, unlike other sectors, energy has a high socio-economic responsibility; Fourth, it, as a typical representative of a natural monopoly, requires state regulation; Fifth, it is necessary to attract a significant amount of investment. This, as a result of the combined influence of other objective factors (ecology, the need for increasingly expensive energy resources, etc.), further increases the capital capacity of the sector [15].

During the last five years (2015-2019), a total of GEL 1,140 million was invested in Georgia's electricity, including 22.1% in electricity generation, 33.6% in transmission-dispatching and 44.3% in distribution. Annually 228 million GEL on average. It was desirable that the share of investment in production be higher.

In large companies such as Telasi and Enguri HPP, the total number of employees is solidly represented by engineering and technical staff and managers. According to the results of the last three years (2017-2019), the share of managers (administration) in Enguri HPP varied from 13.3 to 17.3%, and from 21.7 to 26.7% in engineering and technical staff, and in Telasi respectively. Within the optimal range of 4 - 7,6% and 26,8-28% [16].

3. The tariff change paradigm

Independent regulation of the sector is the big-

gest obstacle to tariff changes. It makes tariffs more stable and acceptable to the public. The regulatory body has been functioning in Georgia for almost twenty-five years and its results are already well known. Research has shown that prices in a regulated market rise much more slowly than in a free market, including for energy products that are not regulated. Assuming that the Consumer Price Growth Index for Ten Years is 1; Then a similar rate of increase in the price of gasoline is 3.39; Kerosene 3.23; Diesel 3; Liquefied gas 3.69 and so on [17].

Particularly important in terms of tariff changes is the factor that has a cumulative impact on tariff growth (ecology, exploitation and investment costs). If we add to this the need to take into account environmental requirements, it becomes clear that obtaining the same amount of energy - production is becoming more and more expensive. Consequently, the technical-economic indicators of the sector, including the tariff, are objectively deteriorating. Then where is the solution?

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We think there is such a solution. We need to achieve the pace of scientific-technological and managerial progress in the field at the pace of deteriorating natural conditions and other negative challenges. Otherwise, the technical and economic indicators of the sector will deteriorate, prices for energy sources will increase.

I believe that humanity will achieve the protection of such a ratio it has such potential. Signs of this are already being observed in the world. For example, Japan, which is arguably isolated from the rest of the world and is not really rich in natural energy resources, has been able to achieve reliable and sustainable electricity supply through scientific, technological and managerial progress, while making the country economically rich and powerful. It now generates \$ 48,472 per capita GDP while consuming 8,816 kWh of electricity, about as much as large, energy-rich and developed countries. As for

the tariff, it is 29.1 cents, which is almost the same as in these countries. It is true that so far there is also a trend of tariff queues, but at a relatively moderate pace [18].

The process of tariff increase is a characteristic feature of market economy countries. The main thing is to be provided with electricity. Sadly, millions of people around the world are now deprived of this goodness.

4. Development concept

For the normal functioning of the Georgian economy, it is especially necessary to take effective measures for the development of the energy complex. For this, it is necessary: 1. Considering the requirements of nature protection, to rationally use the whole complex of fuel and energy resources in the area - hydropower, coal, oil and non-traditional sources; 2. To establish the optimal structure of the fuel-energy complex suitable for the conditions of Georgia. In the fuel-energy complex, taking into account the energy, ecological and socio-economic requirements, their place should be given to both hydro and thermal power and other alternative energy sources; 3. It is necessary for the economic and rational use of these resources to play a great role in the energy supply of the Republic; 4. Georgia must establish reliable and favorable external energy ties with the world's leading countries, including neighboring countries [19].

The interests of the sustainable development of the sector require constant improvement of regulation, improvement of its standards using international recommendations and accumulated experience, including the development of a comprehensive tariff methodology, ensuring the reliability of supply and thus promoting a sustainable investment environment in the energy sector. Increase efficiency.

An important precondition for the transition to the European energy model was Georgia's accession to the energy community in 2017. With this fact, our country was forced to comply with the EU.

Approximation with legislation that is being successfully implemented. At the end of 2019, the Parliament of Georgia has already adopted a new law "On Energy and Water Supply". There is a lot of work to be done in this regard in the future. The energy saving factor is especially important. According to expert calculations, the untapped technological potential of energy efficiency is equal to

about 20% of the total energy consumption of the country. Thus it can be boldly considered as a new energy resource. Electricity capacity in Georgia has been declining in recent years, but its level is still unfavorable [20].

The key directions of energy saving for our country are: acceleration of scientific and technical progress in the field of production and consumption of energy resources; Improving the sectoral, technological and territorial structure of the economy; Expanding the use of non-traditional energy (solar and wind energy; thermal waters, biomass, secondary energy resources, etc.) and small rivers, improving agricultural management and mechanism in energy saving [21].

Energy development obviously requires significant funds. This is often the reason for the underdevelopment of the field. However, a special study showed that if we compare the amount of investment needed for energy development and the possible loss of national income caused by the loss of electricity, we will see that the latter is 5 times more than the former. Therefore, the capital investments required for the development of electricity in Georgia are 5 times less than the losses that will be caused by the underdevelopment of this sector [22].

Conclusion

The increase in energy tariffs is due to many objective factors, including natural conditions and environmental requirements. In order not to increase tariffs, it is necessary to achieve the advancement of scientific-technological and managerial progress in the field at a faster pace compared to the rates of deterioration of natural conditions and other negative challenges.

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