

Complex Analysis of Tariffs and the Paradigm of their Change in Energy

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The role and importance of energy for the socio-economic development of the country are assessed in the paper. The level and dynamics of tariffs for energy products in Georgia in conditions of market economy are analyzed and compared to similar figures of the neighboring former Soviet republics and advanced European countries. The factors acting on the tariffs including the conditions of utilization of existing natural energy resources, the structure of electricity generation, energy efficiency, energy balance and the role of the society in energy development and globalization are characterized. It is concluded that in Georgia, as well as in the world, there is a tendency to increase tariffs. This is due to the need for increased and continuous investment in the extraction (production) of increasing amounts of energy resources, the tightening of environmental requirements, and so on. In order to improve the technical and economic indicators in this field and to reduce tariffs, it is necessary to introduce scientific-technological and managerial progress at a higher rate compared to the existing challenges. © 2021 Bull. Georg. Natl. Acad. Sci.

Georgia, energy, tariff, electricity, natural gas

The basis of sustainable and safe development of the country is a strong fuel and energy complex. It has a defining influence on the development of society, plays a leading role in creation of material and technical base of society and in acceleration of scientific and technical progress, in development of the infrastructure of economy and the increase of efficiency of public production; it is a vital source of the complex organism of economy and the foundation of civilization as a whole; it determines the level and dynamics of reliable and universal domination of man over nature, and creates

necessary guidelines for raising the standard of living and improving working conditions [1].

While the expansion of the field of electricity use is beneficial, its reduction is harmful and destructive for the socio-economic development of the country. This became clear in the first years of Georgia's state independence (1991-1995). It is known that the production and consumption of electricity in Georgia has sharply decreased since 1990. In 1994, the country produced only 7 billion KW. H. or 43% of the maximum level reached in 1989. In 1994, the level of electricity generated in Georgia was the same as it was in 1968, i. e. 26

years earlier. It means that in this field the country retreated by more than a quarter of a century. Mostly that pushed the economy backwards by 36 years, and some of its industries by half a century or more [2].

This fact gives grounds to conclude that in the recession period there was a significant decrease in GDP compared to the reduction in electricity production and consumption. It clearly shows the role and importance of energy in the socio-economic development of the country. During the Soviet years, the growth rate of electricity production lagged behind the growth rate of economy, and this had certain negative consequences for the socio-economic life of the country. In the first years of independence, the situation changed substantially. During that period, the growth rate of electricity production not only slowed down, but was declining at a high rate. The results were also catastrophic. Mainly, the fall in electricity production by one unit reduced the national income by 1.27 units, industrial products by 1.38, agricultural products by 1.88 and railway transport by 2.08 units [3].

Insufficient development of energy, obviously, had a negative impact on the social situation of the Georgian population. Statistics show that at the turn of the 20 - 21th centuries, the standard of living in Georgia was much worse than in the republics of the former Soviet Union relatively better provided with energy. At the end of 1994 the income per capita was equivalent to about 7-7.5 US dollars in Georgia, which was 44% of the value of the minimum (i.e. the poverty line) consumer basket per member of a family of four. For comparison, in Russia the same figure was 163%, or almost 4 times more. According to a survey of 1994, 58% of the population of Georgia could not fully pay for utilities, 72% spent nothing on clothes and 74% on entertainment. In 1994, none of the production facilities was put into operation. The demographic situation also deteriorated. Due to difficult economic and social conditions, according to

official data, about 60 thousand people left Georgia that year. More than half of those who left the country temporarily or permanently were Georgians (GNERC).

A special study showed that if we compare the volume of investments required for energy development and the possible loss of national income caused by electricity shortages, we will see that the latter is 5 times more than the former. Therefore, the amount of loss caused by the imbalance in the development of the economy and electricity in Georgia is more than the capital investments required for the development of this sector [4, 5].

The Society and the Energy Production Tariffs

Pursuing the right tariff policy is a crucial problem not only for the energy sector, but also for the society as a whole and for successful implementation of economic reforms in the country (Law of Georgia on Energy and Water Supply, 2019)

There are many factors influencing the level of tariffs in Georgia. Among them there is a notable deficit energy balance, [6] structure of energy production, [7] state of utilization of existing natural energy resources [8], level of energy efficiency [9], conscious participation of society in energy development [10].

Globalization and a new pandemic created additional problems to economics including energy sector [11, 12].

Georgia has been regulating energy, including tariffs, since 1996 [13, 14], which has played a positive role in the development of the sector. Over the past 25 years, prices for regulated energy products in the country are rising much slower than for non-regulated energy products. However, it should be noted that the electricity tariff increased 4 - 4.5 times during that period.

In terms of rising electricity prices Georgia is no exception. The trend of tariff increase is typical for

the whole world. For example, over 15 years, the tariff in Belgium has increased by 23.2%, on average; in France by 33.8%; in the US by 44.4%; in Austria by 55.2%; in Switzerland by 77.7 %; in Japan 104.9%; in Spain by 115.1%; etc. The absolute level of tariffs is no exception in Georgia. Tariffs are much higher in the developed European countries [15].

The Concept of Tariff Change

As already mentioned, the most impediment to tariff changes is the independent regulation of the sector. 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 in a regulated market the prices rise much more slowly than in a free market, including the prices of the 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 [16].

In terms of tariff changes, particularly important is the factor that has a cumulative impact on tariff growth (ecology, exploitation and investment costs). It is well known that new capacities of fuel extraction (oil, coal, natural gas) as well as hydropower construction are being developed in increasingly difficult conditions. Besides, it is necessary to take into consideration the environmental requirements. Thus, it is clear that production of one and the same amount of energy

is becoming more and more expensive. Consequently, the technical-economic indicators of the sector, including the tariff, are objectively deteriorating [17].

Studies show [18-20] that in order to achieve the goal, the techniques and methods of regulation of this sector need to be further refined with the assumption that better conditions will be created for the large-scale expansion of use of renewable energy sources. Besides, in order to reduce the tariffs on energy products, it is necessary to introduce scientific-technological and managerial progress at a higher rate. Otherwise, the technical-economic indicators will deteriorate.

Conclusion

Energy plays a huge role in the socio-economic development of the country. This is due to the high macroeconomic responsibility of the sector. In market economy, energy production tariffs are characterized by an upward trend, which is caused by many factors. The main one is the need to use an increasing amount of investment. This is required due to gradual deterioration of the natural conditions of extraction and production of energy resources. It is becoming necessary to extract more and more resources from far and deep locations, and environmental requirements are becoming tight.

In order to reduce tariffs on energy products, it is necessary to introduce scientific-technological and managerial progress at a higher rate. Otherwise, there will be an increase in tariffs.

*ეკონომიკა***ტარიფების კომპლექსური ანალიზი და მისი ცვლილების პარადიგმა ენერგეტიკაში****დ. ჩომახიძე***საქართველოს ტექნიკური უნივერსიტეტი, თბილისი, საქართველო**(წარმოდგენილია აკადემიის წევრის ა. სილაგაძის მიერ)*

სტატიაში შეფასებულია ენერგეტიკის როლი და მნიშვნელობა ქვეყნის სოციალურ-ეკონომიკური განვითარებისათვის. გაანალიზებულია საბაზრო ეკონომიკის პირობებში, ენერგეტიკულ პროდუქციაზე ტარიფების დონე და დინამიკა საქართველოში. შედარებულია იგი მეზობელი, ყოფილი საბჭოთა რესპუბლიკების და ევროპის მოწინავე ქვეყნების ანალოგიურ მაჩვენებლებთან. დახასიათებულია ტარიფებზე მოქმედი ფაქტორები. მათ შორის არსებული ბუნებრივი ენერგეტიკული რესურსების ათვისების, ელექტროენერჯის წარმოების სტრუქტურის, ენერგოეფექტიანობის, ენერგეტიკული ბალანსის, ენერგეტიკის განვითარებაში საზოგადოების როლის და გლობალიზაციის მდგომარეობა. გაკეთებულია დასკვნა, რომ საქართველოში, ისე როგორც მსოფლიოში, დამახასიათებელია ტარიფების ზრდის ტენდენცია. ეს განპირობებულია ენერგეტიკული რესურსების სულ უფრო მზარდი ოდენობით მოპოვებაზე (წარმოებაზე) გადიდებული და უწყვეტი მოცულობის ინვესტიციების საჭიროებით, ეკოლოგიური მოთხოვნების გამკაცრებით და ა.შ. ავტორის აზრით, იმისათვის, რომ დარგში გაუმჯობესდეს ტექნიკური ეკონომიკური მაჩვენებლები და შემცირდეს ტარიფები, აუცილებელია სამეცნიერო-ტექნოლოგიური და მენეჯერული პროგრესის უფრო მაღალი ტემპებით დანერგვა არსებულ გამოწვევებთან შედარებით.

REFERENCES

1. Gvelesiani T., Chomakhidze D. (2011) Georgian energy security Universal, Tbilisi.
2. Narmania D., Chomakhidze D. (2020) Georgia's energy balance in the years of independence, *J. Globalization and Business*, 9:197-202.
3. Chomakhidze D. (2011) Energy and Society, Tbilisi.
4. Chomakhidze D. (2016) Energy balance of Georgia. Elsevier AASCI.
5. Mirtskhulava D., Chomakhidze D., Tsintsadze P., Eristavi El., Arveladze R., at al. (2004) Georgia's energy strategy.
6. Irakli Jordania et al. (2015) Natural resources of Georgia. 2:743-786. Tbilisi.
7. Chomakhidze D., Zivzivadze O., Kachkachishvili P., Kiladze A. (2018) The role and importance of energy saving in Georgia, *"Teoretical Economics Letters"*, 8: 1740-1745.
8. Chomakhidze D. (2012) Principles of sustainable energy development. Tbilisi.
9. Gochitashvili T. (2004) New natural gas supply routes and modern technologies, Tbilisi
10. Chomakhidze D. (2016) Georgian energy in the world energy system. *J. Globalization and Business*, 2, Tbilisi.
11. Narmania D. (2020) Economics and socio-economic aspects of the energy sector, *Proceedings of the Third National Scientific National Conference*. Tbilisi.
12. Papava V. (2020) Proceedings of the third national scientific conference on the reflection of the coronamax in economic science and economic policy, Tbilisi.
13. Eristavi E., Chomakhidze D., Tsintsadze P. (2000) Fundamentals of energy regulation, vol.1. Tbilisi.
14. Chikava L. (2004) Innovative economy, News. Tbilisi.
15. Prangishvili I. (2004) Proportion of "Golden carving" in nature, society, economy, business management. *J. Commentary*, 1.
16. Tavadze C., Kavtaradze Ir., Chomakhidze D., Menabde D. (2006) Energy regulation: theory and practice. Tbilisi.
17. Chomakhidze D., Chomakhidze Kh., Chomakhidze Ir. (2020) Peculiarities and principles of energy management. Tbilisi.
18. Chomakhidze D., Kublashvili G., Mosakhlishvili L. (2018) Renewable energy of Georgia: sources and realization. Lambert, academic publishing.
19. Chomakhidze D., Melikidze M. (2019) Methodological and conceptual basis for energy development in Georgia. Lambert academic publishing.
20. Tvalchrelidze A., Silagadze A., Keshelashvili G., Gegia D. (2011) Socio-economic development program of Georgia, Tbilisi.
21. Khurodze R. (2002) New people create new times, Tbilisi.

Received June, 2021