

Nazifov Farkhod Mirzoshoevich,
Peoples' Friendship University of Russia – Moscow

THE CURRENT STATE OF THE ENERGY SECTOR OF THE REPUBLIC OF TAJIKISTAN AND ITS ROLE IN THE FUNCTIONING OF THE NATIONAL ECONOMY

Summary

The energetic sector plays an important role for the development of the Tajikistan economy. The energy consumption of the country reaches approximately 60% of GDP. At the same time, due to lack of own resources, Tajikistan covers about 70% of its fuel needs for resources by expensive imports. The development of the fuel and energy complex annually allocates more than 15% of the total government budget of the country, or more than \$300 million.

Key words: economics, hydropower resources, competitiveness, national economy, promising growth point.

JEL codes: O10, O11, Q25, Q26, Q34, Q4, Y10

Tajikistan is a mountainous country with altitudes ranging from 300 to 7495 metres; 93% of its territory is covered by mountains which belong to the highest mountain systems:

- The north-west and the central part of the country consists of mountain ranges such as Turkeston, Zaravshon, Hisor, and Alay Mountains;
- The south-east – Pamir (one of the highest points of the globe – Somoni Peak – 7495 metres);
- The south-western part is Vakhsh, Hisor, and other valleys;

In the north there is located Fergana Valley.

The natural wealth of Tajikistan is rivers and lakes, which are system-glaciers. The territory of the country has over 947 rivers; the length of an average river is 10 km.

They consist over 60% of water resources of the Central Asian region. Large reserves of snow and ice are in the mountainous regions of the republic. The areas of glaciers in Tajikistan exceed over 8476 square kilometres (Khasanzoda 2014, p. 61).

Tajikistan endowed with rich hydropower resources; its hydro potential is estimated to be 527 billion kWh per year. In technical terms, the waterpower resources of Tajikistan have good prospects for the development and consist of 317 billion kWh per year, of which only 4-5% has been used so far. Tajikistan's hydropower potential ranks number eight after China, Russia, the USA, Brazil, Zaire, India, and Canada. Tajik energy basis is hydropower – over 95%. Tajikistan's hydropower potential is 3 times higher than the current electricity consumption throughout Central Asia. The effective use of these resources will allow the region to be provided with reasonable and green power. The main hydropower potential is concentrated in the basins of the Vahsh, the Panj, the Amu Darya, the Syr Darya, and the Zarafshon Rivers.

During the years of the economic reforms in Tajikistan (1991-2011), in the electric power industry of Tajikistan were some structural and economic changes. All power stations increased their capacity by 12.9%.

In 2011, the south-north power line that allows the country's national grid to be independent went into operation. All this greatly increased the possibility of physical access to energy services of the Tajikistan population. Today the electricity tariff of 2.32-cents/1 kW/h has a social orientation for the population in the country. The state partially subsidises the household electricity tariffs increasing the electricity tariff for all other consumers. The tariff for industrial consumers is 5.61 per 1 kW/h, which is 2.4 times higher than the rate for the population. In addition, the Government subsidises annual electricity consumption of low-income households from the republican budget.

With total revenues of 10,160,600 thousand TJS of the state budget of the country in 2012, 1.54 billion TJS, or 15.2% of the total budget of the country was allocated for the development of the fuel and energy sector. The rising scale of expenditures for the fuel and energy sector preserved in 2015 1,712 billion TJS; more than 1.8 billion TJS has been planned for the sector in 2016.

The hydroelectric power due to the complete commissioning of the units in the Pamir HPP-1, Sangtuda HPP-1 and the construction of numerous small hydroelectric power stations increased by 17.6% and thermal power stations, which are mainly operated with diesel fuel, are fallen.

In accordance with the programme of reconstruction, modernisation, construction of energy facilities, for the development of hydro energy in 2016 the government of Tajikistan intends to invest over \$1.6 billion. The main source of this financial investment is from international companies. The Tajikistan power system consists of 5090 MW; the share of the hydro power stations accounts for 93.9% of the total installed capacity. The deficit of thermal power plants is 300 MW, or about 6.1%. Annual electricity generation in the Tajik energy system, consisting mainly of hydro power plants, is 16.5 billion kWh. It should be noted that more than 98% of electricity in Tajikistan is generated by hydropower plants, including 97% by large and medium HPP.

The total population of the Republic of Tajikistan is 8,352,000 people. Employed people amount to 2,391,436. Most of the population is employed in low-paid sectors of agriculture. Wages and salaries in the energy sector are 5.17 higher. It should be noted that the wage growth in the agricultural domain amounted to 82.26%, and in the energy sector to 56.91%, but in dynamics this situation during four years has not fundamentally changed anything, because wages in the energy sector are higher by 400.17%. As regards increasing the domestic electricity tariff it is worthwhile to keep in mind that the minimum wage is \$50-60 and one bag of wheat flour costs \$35. The other fact is that there is more demand for electricity in winter, when no other sources of energy is available and then consumption can be decreased, when during the winter 90% of population have electricity only for three hours.

After analysing such indicators of average wages, the number of employees, the number and the density of population, in my humble conclusion that Tajikistan's economy is still in an unsafe situation, because of very low living standards, high unemployment and also one of the biggest issues is of course migration. According to the World Bank, the country's improving business conditions. The Government continues to work on the reduction of procedures, reduction of requirements for minimum capital and the creation of the "one stop" service. As a result of policy changes in relation to business development in 2010 and 2012, Tajikistan has entered the top ten countries in terms of the most significant improvement in the business environment, according to the World Bank report "Doing Business" of the Group (Energy Charter Secretariat 2013, p. 1). The economic situation in Tajikistan over the past few years continues to be unstable. At the end of 2014, there was marked the growth of the main macroeconomic indicators. The country, which has no effective domestic sources of growth, the most important factor in stabilising the socio-economic status is now remittances from migrant workers coming mainly from the Russian Federation.

In the first quarter of 2015, remittances from migrant workers totalled \$289 million which is 42.4% less than in the same period of 2014. In late February, the Tajik governor explained the money transfers decreases with an unprecedented fall in the world oil prices, and the Western sanctions against Russia, the reduction of jobs in Russia and a significant drop in the Russian rouble against the dollar. Tajik migrant workers in the territory of Russia are about 998.9 thousand people. Russia says that Tajik migrant workers are 200 thousand less than in 2015. In 2014, the net inflow of remittances from Russia to Tajikistan amounted to \$3 billion 349 million, or 36.2% of GDP; in 2013 – to \$3 billion 587 million, or 42.2% of GDP (*Official internet...* 2015).

The difficulties experienced by the Russian economy significantly reduced the volumes of remittances of Tajik labour migrants from Russia to their

homeland; in my opinion, the role of the energy sector of Tajikistan in the functioning of the national economy is increasing.

The total installed capacity of the electric power system of the Republic of Tajikistan consists of 5070 MW, the percentage of the thermal power stations is 320 MW (6.3%) and the electricity is mainly generated by hydroelectric power stations. Due to the fact the largest reservoir is in Norak (10.5 cubic km). It has a seasonal feature of regulation of the water. In autumn-winter seasons, the deficit of electricity remains 4- 4.5 billion kW/h. Another reason for the deficit of electricity in the autumn-winter period is incomplete functioning of the Dushanbe CHP (which is 198 MW) and Yovon thermal power station (120 MW), which is associated with a reduction of supply in natural gas and petroleum products in the Republic of Tajikistan and the constant increase in energy costs.

For the Republic of Tajikistan there is a situation when the process of securing sustainable economic development depends entirely only on solving the energy issues and providing the energy security. In the winter season, the country experiences significant deficit of electricity around 2.2-2.3 billion kW/h. Because of this reason, Tajikistan had to introduce limitations which affect primarily rural residents comprising not less than 65% of the total population. Because of restrictions of power delivery in rural areas the annual loss of farm production is about 30%. As a result, lack of energy becomes impossible to create new facilities; the existing companies stand idle for several months a year or do not work at full capacity. The negative impact is not only on production but also in agriculture where watering in many cases carried out using the pumps, and hence electricity. The amount of electricity produced and consumed is presented in Table 1 below (Khasanzoda 2014, p. 86).

Table 1. Volumes of electricity produced and received as dynamics for the period of 2012-2014.

Data	2012		2013		2014		variation	
	kW/h	%	kW/h	%	kW/h	%	kW/h	%
Generated electricity	16 974	99.33	17 115	99.32	16 472	99.69	-502	0.35
Generated from the outside of the country	114	0.67	117	0.68	52	0.31	-62	-0.35
Electricity in general	17 088	100	17 232	100	16 524	100	-564	0

Source: own work.

Thus the data presented above show that it is too obvious that in the analysed period the amount of produced electricity is decreased.

Changes in the electricity structure do not vary significantly, actually generated electricity accounts for more than 99%, generated from the outside

amounts to 0.30%. It should be noted that the generation of electricity is reduced and there is decreased its acquiring. There is a difficult lack of electric energy in the country, this situation is negative and brings negative economic issues in the country, and it does not increase the competitiveness of Tajikistan. Thus the competitiveness is a feature of almost all economic entities. As regards the competitiveness of the energy industry, through the use of industry marketing factors, it can be defined as the degree of its consumer appeal, compared to similar services that provide the ability to participate in the struggle for the consumer in the target market segment with real and potential competitors in a specific period of time.

The importance of competitiveness plays an important role in the development of Tajikistan's economy, namely its energy sector that occupies a pivotal position in economic development. The competitiveness of the economy of Tajikistan annually shows strong growth; as evidenced by rating in 2011-2012 the global competitiveness of the economies of the world: 105th place; in 2012-2013 – ranks 100; it took 91st place out of 144 countries participating in 2014-2015.

Energy occupies a special place in Tajikistan, as the main component and the core industrial and agricultural production, an integral part of citizens' life support systems, as well as education, transport and telecommunications. Tajik Energy – is the platform of a civilized way of life of its citizens.

In my opinion, the competitiveness of Tajikistan, as an economic category, manifested in the close relationship of economic growth in the energy sector. The energy complex is the “point of development the competitiveness for the country”. Currently, the economic situation in the country is stagnant because of the lack of electricity, stops the construction and development of industries, agriculture, and all other industries. In Table 1.2, we analyse the energy consumption by sectors.

Table 2. Consumption of electricity by sectors

Data	2012		2013		2014		variation	
	kW/h	%	kW/h	%	kW/h	%	kW/h	%
Industry and construction	6344	45.75	5496	40.28	4057	32.83	-2287	-12.91
Transport	37	0.27	38	0.28	41	0.33	4	0.07
Agriculture	3832	27.63	4103	30.07	4020	32.53	188	4.90
Other sectors	3655	26.36	4006	29.36	4238	34.30	583	7.94
Total	13868	100	13643	100	12356	100	-1512	X

Source: Khasanzoda (2014, p. 87).

According to the Statistics Agency under the control of the President of the Republic of Tajikistan, the development of the country is particularly prevented because of the lack of electricity, and is too difficult to develop without solving the issue of the electricity in the country. Interdependence of the reduced generation of electricity with the development of key sectors of the economy is obvious: industry and construction, there has been a nosedive in energy generation and, consequently, stops the development of the whole industry.

In the agriculture sector, a slight increase in the generation of electricity, due to the fact that the Tajik government subsidises this sector because of developing the sector and installation of a new programme for the industry. The negative factor is the reduction generation of electricity by 10.90% that can also decrease the country's economic development and competitiveness.

At the moment, the Tajikistan's energy complex is under an active development, and is a promising growth point of the national economy, contributes the increasing competitiveness of the industrial complexes, improving social and economic indicators, as well as contributes to the political stability. At the present and in the future, the energy complex of the country provides hydropower resources.

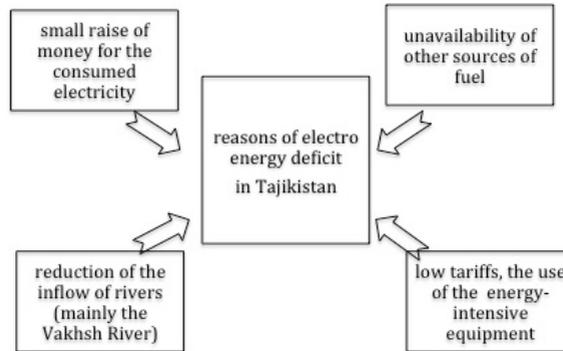
99% of electricity is generated by hydroelectric power stations, and only 1% is generated by thermal power stations (Khasanzoda 2015, p. 160).

In seasons like autumn and winter, there is a huge deficit of electricity, which consists of about 4-4.5 billion kW/h. Each year during this period, there are introduced limits of consumption of electricity. During the summer period, the country is able to produce electricity in the huge volume, which allows not only consume the domestic needs of the country, but also exports it to the neighbouring countries like Kyrgyzstan and Pakistan (*Social-economic situation...* 2014). The reason for the deficit of electro energy is analysed in Figure 1 below.

Due to the facts that in the seasons like the autumn and winter period the inflow of water reduces in the rivers, there also occurs a descent in production capacities in hydroelectric power stations. Also there occurs the need to introduce a limited mode for electric consumption.

In such situation, the need for electricity is not satisfied by socio-economic sectors in the country, as noted above, in a year, the deficit of electricity remains in amount of 4.5 billion kW/h.

Tajikistan has a very rich water potential. This explains the predominant use of hydropower in the energy sector. Nowadays, the strategy of the government of the Republic of Tajikistan of development of the energetic complex is aimed on providing a reliable power supply to consumers, the reduction of energy loss, solving of the issues associated with an acute shortage of electricity in winter period, the implementation of sustainable export excess energy in the summer period and carrying out the most important financial reforms.

Figure 1. Reasons for electric energy deficit in Tajikistan

Source: own work, based on statistical data guides.

Summing up the results, I would propose a “new approach” to the disclosure of the essence of competitiveness of energy complexes: such an approach would include all of the above approaches to define the essence of competitiveness and special components of the “new approach” will be political factors, which are currently showing their importance for the economic development of any country, controlling factors. The “new approach” will characterise the advantages that are necessary to improve the competitiveness and development of the energy complexes.

There is also the term like ‘political’, which can be understood as factors such as: the management strategy of operating the energy complex, historically developed relations of the countries, the negative impact of competitor countries in the area of electricity. The “controlled” factors are: to control the sale of electricity, to reduce the electricity loss in the grid. And thus, the “new approach” to obtain competitive advantages includes: the efficient use of water resources, which is manifested in the reduction of costs (renewable sources) and ecological approach, as generated clean power. In the today’s world, its usefulness has no analogues; the demand is always growing, to generate electricity new technologies are being used. The political approach in this case is to find investors for projects such as the Rogun HPS partner countries, the ‘neutralisation’ of Uzbekistan bilateral agreements and politically literate position of Tajikistan, the confirmation of the need for security and the construction of the Rogun hydroelectric power station, the controlling factor is the loss of electricity in the grid should call the confidence of investors and plan ways of joint activities. Also I note that the energy complex in Tajikistan is competitive and takes a significant niche for private consumers and for the industry as a whole. These clarifications are of the “new approach”. The revealing of the essence of competitive energy sector allows:

- considering special factors, to develop a strategy to improve the competitiveness of the energy complex, which shall follow the requirements of modern economic development of the energy market;
- to use the “political factors” that are responsible of the specific requirements of all groups of market entities;
- as current prices do not develop competitiveness, to determine the pricing policy for the energy sector;
- to determine the exact plan of increasing competitiveness of the energy complex, which can provide a stable economic growth and improve quality of life, and relevant with the global significance;
- to create a strategy for improving competitiveness, the cooperation system during the formation of the competitive advantages and to strengthen the market position of the energy complex.

The competitiveness of the energy sector cannot be achieved in a short period of time as it is necessary for Tajikistan to increase its competitive advantage, and it is mainly in the construction of the Rogun hydroelectric power station, requires large financial investments as well as settlement of the conflict on this issue with Uzbekistan. This leads us to the conclusion that the energy complex of Tajikistan is in its infancy and has only enough resource advantages.

But as already noted that the amount of competitive advantages is the competitiveness of the energy complex. We examine in his article the essence of external and internal factors affecting the competitiveness of the energy sector of Tajikistan, which are presented in Table 1.3.

Electricity tariffs in Tajikistan for the population are socially oriented and are set based on the average income per family (household). Tariffs for residential consumers are subsidised at the expense of other categories of consumers. The size of tariffs is set in such a way as to cover the operating costs, repair and maintenance, administrative expenses and depreciation costs; they are determined by the Department of Planning OAHK “Barki Tojik” and approved by the antimonopoly service under the Government of the Republic of Tajikistan.

Tajik electricity supplied around 228 million kW/h to Afghanistan and Kyrgyzstan in August 2015. In particular, it is emphasised in the report that 185.5 million kW/h of electricity were exported to Afghanistan and another 14.6 million kW/h to Kyrgyzstan. Setting to the neighbour countries, electricity report is almost 15% of the total electricity, which was generated in Tajikistan in August 2015.

According to the Ministry of Economic, Development and Trade of the country, there were 1 billion 563 million kW/h. Since the beginning of the year, Tajikistan has exported totally about 1 billion kW/h; to Afghanistan, particularly around 890 million kW/h, and about 105 million kW/h to Kyrgyzstan. It should be noted that Afghanistan receives each kilowatt of Tajik electricity by 3.7 cents, and Kyrgyzstan by 2.5 cents.

Table 1.3. The internal and external factors of competitiveness of the energy complex of the Republic of Tajikistan

External factors (independent of Tajikistan)	Characteristics of the factor	Internal factors	Characteristics of the factor
1. Hydro resources	Water resources (reservoir)	1. Political	Strategy of the government. Solving the issues of conflict with Uzbekistan.
2. Social	Low income levels (low price on electroenergy)	2. Controlling (energy loss)	The use of energy-saving technologies
3. Economic development	Engagement of investors	3. International agreement	For the conflict settlement with Uzbekistan.
4. Technologies used to generate electricity	No own	4. Investments (government)	For the construction of the Rogun hydroelectric power station
5. Personnel	No own	5. Legal regulation	There is currently no energy market (natural monopoly)

Source: Khasanzoda (2014, p. 86).

In this year, “Barki Tojik” received from the export of electricity about \$36.8 million: almost \$33 million from Afghan consumers and approximately \$3.8 million from Kyrgyzstan. This has led to the allocation of the fourth aspect of the energy complex – the lack of a real energy market.

This study allowed highlighting the features of the energy sector of Tajikistan:

1. The main point of the Tajikistan’s energy sector is its attachment to the hydropower; it makes vulnerable the entire complex.
2. Development of the energy sector as an economic point of growth, capable enough to solve many social and economic issues, to raise the country in international rankings to a higher level, and thus to attract investors into the country.
3. Competitiveness of the energy sector of Tajikistan is provided due to the huge volume of hydropower resources.

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Obecny stan sektora energetycznego Republiki Tadżykistanu i jego rola w funkcjonowaniu gospodarki narodowej

Streszczenie

Sektor energetyczny odgrywa istotną rolę w rozwoju gospodarki Tadżykistanu. Krajowe zużycie energii sięga ok. 60% PKB. Z drugiej strony, z powodu braku własnych zasobów, Tadżykistan pokrywa ok. 70% swych potrzeb paliwowych kosztownym importem. Rozwój kompleksu paliwowo-energetycznego rozdysponowuje ponad 15% całego centralnego budżetu państwa, czyli ponad 300 mln dolarów.

Słowa kluczowe: ekonomika, zasoby energii wodnej, konkurencyjność, gospodarka narodowa, obiecujące tempo wzrostu.

Kody JEL: O10, O11, Q25, Q26, Q34, Q4, Y10

Artykuł nadesłany do redakcji w lipcu 2015 roku.

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Afiliacja:

Nazifov Farkhod Mirzoshoevich, PhD student
Peoples' Friendship University of Russia
Department of Marketing, Faculty of Economics
Miklukho-Maklaya str. 6
Moscow, Russia, 117198
phone: +7 985 046 16 16
e-mail: fnazifov@gmail.com