

ON THE ISSUE OF ASSESSING THE DAMAGE CAUSED TO THE ENERGY SYSTEM AS A RESULT OF THE 3-RD ARTSAKH WAR OR THE 44-DAY WAR

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Key words: economic damage, the "golden rule of economics" principle, autonomous energy producer, investment policy, capitalization growth.

Introduction. In the work, the amount of damage suffered by the energy system as a result of the 44-day Artsakh war was fundamentally coordinated and evaluated, as well as different points of view and professional approaches were analyzed, as a result of which it was revealed that the need for structural reforms to increase energy efficiency due to changes in the structure and rules of operation of the energy sector. Moreover, the effectiveness of reforms in the energy system is due to the involvement of strategic investors, as well as the conclusion of contracts with internationally recognized energy services partners, the introduction of innovative technologies related to energy saving, and the complex involvement of energy service companies.

Methodology. In the article, the current situation in the field of energy and gas in the Republic of Artsakh was calculated, as well as the amount of damage suffered as a result of the war, using statistical, mathematical and comparison methods, using various formulas developed by theorists. Energy system is one of the most important components of inclusive economic growth and development of any country. This sector is characterized by continuous transformations in line with new challenges, the purpose of which is to ensure a stable operation in the sector [Jenergetika, 2011, 398]. In the other hand, the regulation of the energy sector is part of the state policy, the purpose of which is to balance the interests of consumers and license holders, to create uniform conditions of activity for license holders, and to promote the formation and development of a competitive market, guaranteeing the rights of consumers, by exercising the powers assigned to the Commission [Mikayelyan, 2021, 327-331]. Thus, the energy system is a hub of interaction between the private and public sectors, the operation of which has a large and wide-ranging environmental and social impact. It creates new jobs, opens opportunities for doing business, and also activates the work of business structures. As a result, it was argued that the differences in formulas are due to the fact that the company implements constant or unchanging financial, operational and investment policies, without taking into account the risks that always accompany the development process, on the contrary, their main emphasis is placed on capitalization growth.

Literature review. Being one of the most important and driving sectors for the economy, energy greatly supports and supports technical and technological developments. Modern technologies are "penetrating" the energy sector, and innovations are

causing changes in the sector, highlighting the opportunities for the development of alternative energy [Michaelyan, 2020, 235-244]. The features of social development had a significant similarity in the formation of energy markets, in particular, the increase in the consumption and demand of energy resources as a result of the use of new technologies, the reduction of costs, as well as the definition of a new tariff policy in that system. The current state of energy in the Republic of Artsakh, as well as the amount of damage suffered as a result of the war, were substantiated in the article. In terms of increasing the efficiency of the strategic management of the energy system, the assessment of the relationship between economic growth and the indicators characterizing that system has been widely used. According to V.G. The principle of Belolipetsky's "golden rule of economy" can also be applied to the energy system. Another author M. Kisilyov [Kiselev, 2001] considered the efficiency of the energy system according to sales volume, profit growth rate and exchange rate factor.

Novelty. The losses and the amount of financial damage of the Energy companies ("Artsakhenergo" CJSC, "Artsakhgas" CJSC, "Artsakhhek" CJSC) as a result of the 44-day Artsakh war were estimated (according to the "golden rule" principle and the "Boston Consulting Group" model), and also proposed is to review the methods and principles of financial strategy in the NKR energy system due to economic changes and geopolitical realities.

Analysis. On September 27, 2020, the 3rd Artsakh War or 44-day war began, in particular, the Azerbaijani-Turkish military aggression and geopolitical events had disastrous consequences for the Republic of Armenia and the Republic of Artsakh: thousands of victims and prisoners, tens of thousands of wounded, huge material and moral losses, the loss of all territories "adjacent to Nagorno-Karabakh", The loss of parts of the Askeran, Hadrut, Martuni, Martakert regions of Nagorno-Karabakh, the cities of Shush and Hadrut, the defeat of the Armenian army, the redrawing of a number of border regions of the Republic of Armenia in favor of Azerbaijan, a sharp deterioration in relations with the allied states and earning a reputation of an unreliable and irresponsible partner.

Obviously, although in case of such huge losses it is difficult to separate internal and external factors from each other. A sad fact is the surrender of 7 districts, which were under the control of Armenian forces for almost 3 decades, in particular the loss of Hadrut and Shushi, which are part of the Republic of Artsakh, the deployment of Russian peacekeepers, the land communication between Azerbaijan and Nakhijevan (which is part of it) through the territory of Armenia, thousands of victims and wounded, many thousands of internally displaced persons, more than 70 percent of Artsakh came under the control of Azerbaijan and there is great uncertainty and many questions. The 3rd Artsakh War ended with an unspeakably painful decision on November 9, 2020. One of the economic losses recorded in the country during the 3rd war of the Republic of Artsakh is that before the war the Lernahovit community of the Kashatagh region of

Artsakh consisted of 3 villages. Until 2016, the villages of Yeznagomer and Spitakadzbur, which were inhabited 15 years ago, had no electricity. And in the village of Shirvakan, there was only electricity for a few hours a day.

In recent years, the rapid construction of hydroelectric power plants in Artsakh has provided electricity to these never-before-electrified communities. The aforementioned villages were supplied with electricity from the “Akunk” HPP, which was built in 2016. As a result of the war, it went completely under Azerbaijani control. Villages belonging to the Lernahovit community also passed to Azerbaijan. The large and small HPPs operating in Artsakh provided electricity not only to the population of Artsakh, but the electricity they produced was also exported to Armenia. For Armenia it was a small, but relatively cheap electricity, and for Artsakh it was an additional opportunity to ensure the operation of the economy. The shutdown of the Metsamor nuclear power plant due to repair work, the temporary shutdown of the 5th electrical generator unit of the Hrazdan TPP, safety problems with hydroelectric power plants operating in Southern Armenia and Artsakh, the loss of a number of hydroelectric power plants as a result of the war have put Armenia before new energy challenges, at the same time having a serious impact on the country's economy.

As a result of the 44-day war, the Republic of Artsakh lost a number of hydroelectric power plants, some of which were dismantled, and the main equipment and some infrastructure facilities were transferred to the Republic of Armenia. Moreover, before the war, the Martuni region of the Republic of Artsakh was supplied from the Shushi-Karmir Shuka-Martuni transmission line, and after the war most of the line remained under enemy control.

In general, as a result of the war, the Republic of Artsakh lost hydroelectric power plants with an installed capacity of 112,5 MW, including:¹

- Sarsang HPP: 50 MW;
- 4 HPPs: 12-13 MW;
- 1 HPP: 12 MW.

Before the war, there were HPPs with an installed capacity of 187,5 MW in the Republic of Artsakh, but as a result, only HPPs with an installed capacity of 75 MW remained. We have calculated the current state of energy in the Republic of Artsakh, as well as the amount of damage caused by the war. “Artsakhenergo” CJSC was established on December 29, 1998. The company is mainly engaged in the distribution and sale of electricity. Distribution of electricity is carried out at fixed tariffs by the

¹ <https://www.energyagency.am/category/noroutyouanner-ev-mijocaroumner/arcakhy-112-5-mvt-drvatsqayin-hzoroutyamb->

Public Services Regulatory Commission of the Republic of Artsakh. It serves more than 30,000 subscribers¹.

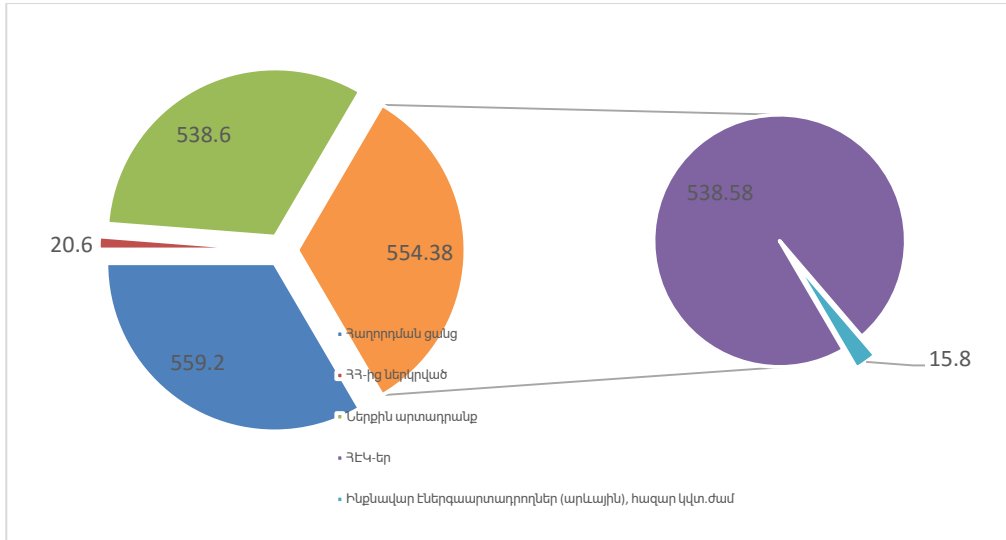


Figure 1. Structure of electricity supplied to the transmission network of “Artsakhenergo” CJSC in 2020 (million kWh)

- . Transmission network
- . Imported from RA
- . Domestic production
- . HPPs
- . Autonomous energy producers (solar), thousand kWh

After the war, eight hydroelectric power plants operate in the Republic of Artsakh, and one hydroelectric power plant is under construction. According to "Artsakhenergo" CJSC, in 2020, 559.2 million kWh of electricity was supplied to the transmission networks, including imported from Armenia: 20.6 million kWh, domestic production: 538.6 million kWh, of which: HPPs: 538.58 million kWh, autonomous energy producers (solar) - 15.8 thousand kWh (Figure 1). 207.0 million kWh of electricity was transferred to the enterprise that sells electricity flows, including 186.4 million kWh for export. Electric power purchased for internal consumption was 352.2 million kWh, of which total supply to consumers, i.e. sales, was 311.7 million kWh, and electricity consumption for own needs was 1.0 million kWh. Actual losses of electric power amounted to 39.5 million kWh or 7.1%. As a result of the 44-day war in Artsakh losses of HPPs are recorded, the assessment of the financial damage of which has no exact amount, as a general assessment of the damage caused to the Artsakh energy system as a result of the

¹ <http://www.artsakhenergo.am/content.php?catid=3>

war does not exist yet. For example, there is a point of view that the lost HPPs with sub-stations may be worth about 200 million USD, as they were all privately owned.¹

According to the preliminary energy balance for 2021, it was planned to import 330 million kWh of electricity from Artsakh, but it is possible to replace it with electricity generated from domestic resources of Armenia. Power supply has been fully restored in Artsakh, except for the Martuni district. Unfortunately, it should be noted that the electricity produced in Artsakh does not supply the entire population.

Looking at the financial statement of “Artsakhenergo” CJSC, “Reserves” in 2020 decreased by 21% compared to 2019, while “Accumulated Losses” increased by 48.9% over the same period. In addition, in the statement of the cumulative financial result of “Artsakhenergo” CJSC, the net loss in 2020 increased by 104.1% compared to 2019.

According to Table 1, the amount of financial losses of “Artsakhenergo” CJSC as a result of the 44-day Artsakh war is estimated at 12791324 AMD.

Table 1. Assessment of financial losses of “Artsakhenergo” CJSC in 2019-2020 (thousand AMD)

| Indicators | 2019 | 2020 | 2020 vs. 2019, % | Financial loss (2020 vs. 2019) |
|-------------------------|----------|-----------|------------------|--------------------------------|
| Supplies | 1046525 | 863005 | -21.3 | -183520 |
| Accumulated loss | -6148885 | -12024346 | 48.9 | -5875461 |
| Net loss | 265547 | -6466796 | 104.1 | -6732343 |
| Just a financial loss | | | | -12//791324 |

From the point of view of increasing the efficiency of the strategic management of the energy system, the assessment of the relationship between economic growth and indicators characterizing this system has become widespread. At the same time, the paper highlights the application of the principle of the "golden rule of economics"[Belolipetsky, 2005] according to which the growth rate of profit (GRP), sales proceeds (SP) and change in the balance sheet currency (C) should not be equal to each other [Kiselev, 2001]

RP> SP>C> 100% (1) [Lavlinskaya A., 2019, 4-7].

- the rate of profit is higher than the rate of sales proceeds, which justifies the cost reduction,

- the growth rate of sales proceeds is greater than the company's assets, which justifies the efficient use of the company's resources,

- the economic potential of the company increases compared to the corresponding basal period.

¹ <https://www.armtimes.com/hy/article/204871>

Based on the data on the financial position of the company, the paper calculates the "golden rule" principle of "Artsakhenergo" CJSC, which does not correspond to the formula (2).

Table 2. Assessment of the "golden rule" principle of "Artsakhenergo" CJSC (thousand AMD)

| Indicators | 2019 | 2020 | 2020 vs. 2019, % | RP> SP>C> 100% |
|------------------------------------|----------|----------|------------------|----------------|
| Gross profit | 4882207 | 4770108 | -2.4 | does not match |
| Revenue from sales | 15393720 | 16667731 | 7.6 | |
| Own capital and liabilities | 3114253 | 12018344 | 74.1 | |

R. Higgins' internal growth rate, also called the company's sustainable growth model, is calculated using the following formula:

$$g = \frac{(ROExb)}{(1-ROExb)} \quad (2) \quad [\text{Lavinskaya, 2019, 4-7}]$$

where:

- g – is the sustainable growth rate in % terms,
- ROE – is the return on equity ratio
- b – is the accumulation factor.

According to another approach, such as the R. Higgins model, growth opportunities are determined by the internal resources of the company, and the efficiency of production and commercial activities through the profitability of net assets. This model characterizes the steady growth of the company at the expense of its own sources of financing. However, the activities of companies are often associated with the inclusion of not only their own, but also borrowed capital. Therefore, in terms of strategic management of the company, the model developed by the Boston Consulting Group has gained wide popularity. This model is a system of equations that allows you to calculate the increase provided by the growth of assets, liabilities and equity. The latter considers the stable growth of the company as an increase in sales due to the stability of the operating and financial policies [Lavinskaya et al., 2019, 705-709]:

$$g = \frac{NI}{S} \times \frac{s}{Ax} \times \frac{A}{E} \left(1 - \frac{DIV}{NI} \right) \quad (3)^1$$

where:

- g – is the sustainable growth rate in % terms,
- NI is the number of income before tax,
- A – is the amount of assets,
- S - sales volume,

¹ <https://upravlennets.usue.ru/images/56/3.pdf>

DIV – is the derived investment value,
 E – own capital.

The differences in the formulas presented are due to the fact that the company implements a constant or unchanging financial, operational and investment policy, without taking into account the risks that always accompany the process of development, on the contrary, their main emphasis is on the growth of capitalization.

Table 3. Sustainable growth strategy of “Artsakhenergo” CJSC based on the Boston Consulting Group model (thousand AMD)

| Indicators | 2019 | 2020 |
|------------------------------------|----------|----------|
| Gross profit before tax, | 4882207 | 4770108 |
| Total assets | 17714690 | 10273922 |
| Revenue from sales | 15393720 | 16667731 |
| Own capital | 4404956 | -2061840 |
| Income related grants | 15253 | 7963 |
| Gross income related grants | 4866954 | 4762145 |

As it can be seen from the data in Table 3, in 2020 all indicators decreased compared to 2019, and using the formula (3) the following calculation was made:

- $g_{2019}=0.01$
- $g_{2020}=0.02$

The results show that the operational and financial policies pursued by "Artsakhenergo" CJSC have not changed to some extent.

Conclusion. The factors affecting the energy system of the Republic of Artsakh, as well as the extent of their influence, were coordinated.

The paper calculated the losses of "Artsakhenergo" CJSC and the reasons for the decrease in the level of profitability of CNG plants. In addition, the point of view was distinguished, according to which not all schemes of global development and various integrations are applicable in Armenia and Artsakh, and so far the main developments are due to the rather wide spread of alternative energy receiving stations. In addition, by applying video-methodological approaches, the assessment of the "golden rule" principle of "Artsakhenergo" CJSC was substantiated. It was concluded that with current operational and financial policies, the company cannot grow faster than the growth rate g without resorting to financial borrowing. Therefore, if "Artsakhenergo" CJSC wants to grow at a faster pace, it is necessary to change the approaches to financing activities, adjust the main parameters of financial leverage, clarify and agree changes in the dividend policy with the owners or ensure more efficient use, and in the presence of

existing resources, in other words it means to increase the level of economic profitability of assets.

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The article analyses scenario approaches to the development of the energy system of the world, as well as agreeing on the positive and negative sides, and proposes practical mechanisms to improve the efficiency of the energy system of the NKR. Modern models of energy development are presented in the article, of which 6 are mainly used. The necessity of using the SCANNER model to improve the efficiency of the energy system of the NKR is especially emphasized, because it is as close to reality as possible. The paper calculated the losses of "Artsakhenergo" CJSC and the reasons for the decrease in the level of profitability of CNG plants. In addition, the point of view was distinguished, according to which not all schemes of global development and various integrations are applicable in Armenia and Artsakh, and so far the main developments are due to the rather wide spread of alternative energy receiving stations.

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