

## **Armenian Energy Sector: A General Overview**

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Armenia is a small country that gained independence after the collapse of the Soviet Union, which does not have access to the open seas and does not possess significant natural resources. The country is completely dependent on imports of hydrocarbons, mainly oil and natural gas, as well as oil products.

It should be noted that Armenia mainly purchases natural gas from Russia, the price for which is \$ 165 per thousand cubic meters. In principle, if for the beginning of 2021, this price was considered high, and Armenia was looking for ways to reduce it. Later, in October 2021, when spot prices in European markets reached \$ 900-1200 per thousand cubic meters, this price became very favorable. Now Armenia can only hope that Russia will not change the gas price upward, due to the current situation in the gas market.

At the same time, on the domestic market, the price of gas for the consumer is about \$ 320 per thousand cubic meters of gas. The distribution is handled by Gazprom-Armenia, a 100% subsidiary of the

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Russian PJSC Gazprom (which exports gas to Armenia). The company also carries out transportation, storage, distribution and sale of gas, reconstruction and expansion of the gas transmission system and underground storage facilities.

Armenia made attempts to diversify natural gas supplies through the only possible option - gas imports from Iran. For this purpose, the Iran-Armenia gas pipeline was built. However, the controlling stake in the gas pipeline belongs to Gazprom-Armenia. Therefore, it was not possible to achieve high-quality diversification. Armenia also claims that Gazprom, to maintain control over the market, insisted on reducing the diameter of the pipeline from 1420 to 700 millimeters in order to reduce its throughput.

It is worth noting that part of the electricity produced from Iranian gas is returned to this country as payment for the gas supplied. This is beneficial for Armenia, since the Hrazdan-5 thermal power plant produces 4 - 4.1 kilowatt-hours from one cubic meter of gas, and the Yerevan thermal power plant - about 4.5 kilowatt-hours of electricity. Of this share, Iran is given three kilowatt-hours, and the rest of the energy goes to the energy system of Armenia. In total, according to this scheme, Armenia sent 1.1 billion kilowatt-hours to Iran (590 million - ErTEC, 510 - "Hrazdan-5"). In general, a significant share of electricity in Armenia is produced at Thermal Power Plants, which mostly run on natural gas and fuel oil. They produce up to 40% of the country's electricity portability.

The Madzamor Nuclear Power Plant, built in 1977 and commissioned in 1980, plays an important role in providing electricity. Materials, equipment, and operation of the NPP are provided by Russia. This station accounts for up to 30% of the generated energy in Armenia. However, this station was technically outdated long ago

and even its activity was suspended after a major earthquake that occurred in Armenia in 1988. Armenia is in a seismically active zone, therefore there are great risks, damage to the station due to the next earthquake and an accident at it. However, because of the war with Azerbaijan, oil and gas supplies from this country were stopped. Armenia faced an acute shortage of energy and was forced to re-establish the operation of the station. In 1996, a new block was installed at the station, which annually produces an average of 2.5 billion kWh of electricity. In 2014, Russia and Armenia signed an agreement to extend the operating life of the Madzamor nuclear power plant until 2026. A year later, in 2015, Russia provided a loan of \$ 270 million and a grant of \$ 30 million (the work was to be completed in 2020, as required by the terms of the loan. However, the repair was not completed on time, only \$ 190 million of the allocated funds were used. In this regard, the Armenian side asked to postpone payments on the loan for a year, until the end of 2021. Russia refused, and the rest of the work to be carried out already at the expense of the state budget (about 132 million dollars were allocated. This amount is a heavy burden on the country's budget).

Currently, work is underway to extend the life of the Nuclear Power Plant, which generates up to 45% of all electricity produced in the country. However, the strategic program for the development of the energy sector of Armenia, approved by the government, provides for the extension of the operating life of the Armenian nuclear power plant after 2026.

Every year the period of repair work at the station increases, which affects the total amount of electricity generated. In short, in 2021 the station was idle for about 140 days, instead of the usual 45 days, as it happened before. That is, in fact, for a third of a year Armenia could not use the relatively cheap energy from the Nuclear Power Plant.

The suspension of a Nuclear Power Plant for repairs has a major impact on the total electricity generation and its price. A large load of electricity generation transferred to the Thermal Power Plants. In conditions when prices for oil and oil products, and hence for fuel oil, are growing, the cost of generated electricity is increasing.

Even though the life of the NPP has been extended until 2026, its production facilities are outdated and are a source of serious danger. In addition, due to economic problems, there was an outflow of highly qualified specialists employed at the station from Armenia. As a consequence, the EU, which has close cooperation with Armenia, is demanding the closure of this station, in view of its serious danger to the environment. Armenia cannot restore, modernize or build a new station, since there are no funds for this. The cost of building a new NPP unit can cost \$ 5-6 billion (For comparison, the revenue part of the budget of Armenia in 2021 was predicted at the level of \$ 3 billion 70 million). So, Armenia has no money for the construction of a new NPP or the installation of a reactor. And if this is not done, then after 2026, an increase in electricity prices cannot be avoided. Therefore, Armenia is trying to involve Russia in the construction of a new NPP. Negotiations are underway both at the government level and with the Russian private company Geopromining. Along with Thermal Power Plants and the Madzamor NPP, electricity in Armenia is generated at Hydroelectric Power Plants, the main of which are Sevan-Hrazdan and Vоротan. The total volume of electricity produced is 1,500 million kWh per year. In general, Hydroelectric Power Plants together with wind farms (there are two wind farms in Armenia) account for up to 30% of the electricity produced. At the same time, at the most powerful facility in the sphere of hydropower in Armenia, the Vоротan cascade of Hydroelectric Power Plants, one of the stations, Shambaska, will be under repair for almost a year. As

a result, the share of the Vorotan cascade in the total electricity generation in Armenia will decrease from approximately 16% to 13%.

For many years Armenia received electricity from the territories of Azerbaijan occupied by it. It is worth noting that the numerous Small Hydroelectric Power Plants built in the occupied territories produced electricity, which was used both in Armenia and in the self-proclaimed region of Karabakh. At the same time, it was cheaper than the energy generated in Armenia itself. After Azerbaijan liberated its territories, 32 of 36 stations came under the control of Azerbaijan. Thus, Armenia was deprived of this cheap energy source.

All these factors caused Armenia to increase the prices for electricity within the country. From February 1, 2021, the weighted average tariff for electricity in the country was increased to 2.27 drams per 1 kWh, including VAT. For socially disadvantaged families and citizens who consume up to 400 kWh of electricity per month (this is about 90% of individual users), the tariff was kept at the same level, and for other consumers it increased by 3 drams per 1 kWh. For socially disadvantaged families, the following tariffs apply: daily - 29.99 drams per 1 kWh, night - 19.99 drams per 1 kWh. At present, in Armenia the tariff for electricity in the daytime is 44.98 drams per 1 kWh, the night tariff is 34.98 drams per 1 kWh. (\$ 1 = 472.20 drams). It is possible that prices will also increase in 2022.

The rise in prices for energy resources is also influenced by the increase in oil prices on the world market. Favorable news related to the coronavirus vaccination, the agreement between the main oil producers under OPEC +, economic growth at the global level, have led to a rise in oil prices. At the same time, a curious picture is observed in Armenia: since the beginning of 2021, gasoline prices in Armenia. So, if at the beginning of the year a full tank would have cost \$ 49,

then in March it cost \$ 43, in other words, \$ 6 less. At the same time, the price of gasoline in Russia, from where Armenia mainly imports it (as well as from Bulgaria and Romania), is more expensive. In addition, this year, gasoline prices in Russia in September 2020<sup>1</sup> increased by about 6.25% compared to the beginning of the year. Increased excise tax on gasoline and VAT, which are 30% of the price.

Such a paradoxical situation in Armenia with gasoline prices, Armenian experts associate with the dumping policy of some companies related to the sale of gasoline. It should be noted that until recently there were only three large companies in Armenia that were engaged in the sale of gasoline. Now their number has grown to ten. It is believed that large companies are trying to squeeze small ones out of the market by artificially lowering prices. Once they reach their target, gasoline prices will skyrocket immediately.

Thus, the monopoly position of Russia in the supply of various kinds of energy resources to Armenia, the limited possibilities for diversification of sources are the structural problems of the energy sector in Armenia. Along with this, this year there are conjunctural problems, which over time can also become structural. In Armenia, a sharp decline in electricity production is expected due to the suspension of the Madzamor NPP, a reduction in the potential for energy consumption from the Hydroelectric Power Plant, as well as an increase in prices for fuel oil and possibly natural gas.

These circumstances will cause Armenia to face energy problems in the short and medium term. Their solution requires large financial resources, which Armenia does not have.