

THE ROLE OF THE ALUMINUM INDUSTRY IN AZERBAIJAN'S ECONOMY: A GENERAL OVERVIEW

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Abstract

Azerbaijan is the main oil and gas exporting country in Eastern Europe and one of the main energy suppliers in Europe. Azerbaijan, whose economy is based on the oil industry, has recently seen a certain revival in the non-oil sector. Azerbaijan is also one of the main producers of aluminum in Eastern Europe, and there are partnerships with Europe in the development of this industry as well as in the energy sector. The development of the non-oil sector in Azerbaijan is essential for the country's economy. This sector is heavily dominated by the aluminum industry. As part of the research, an economic analysis review of the Azerbaijani aluminum industry in the non-oil sector is implemented.

In 2022, \$3 billion worth of non-oil sector products were exported from Azerbaijan to the global market; the aluminum industry accounted for more than 5% of this total. Azeraluminium LLC, the Caucasus region's sole primary aluminum producer, exports 98% of its products to countries around the world. The general platform and development of the Azerbaijani aluminum industry, the brief technological structure of the Ganja Aluminum Complex, and the future strategy and goals of this field have all been demonstrated in a concise scientific article. The main aim of this research is to analyze the Azerbaijani aluminum industry.

Keywords:

Economics, aluminum industry, economy of Azerbaijan, non-oil industry, business development.

JEL Classification:

A11, F63, L21, L61, M20.

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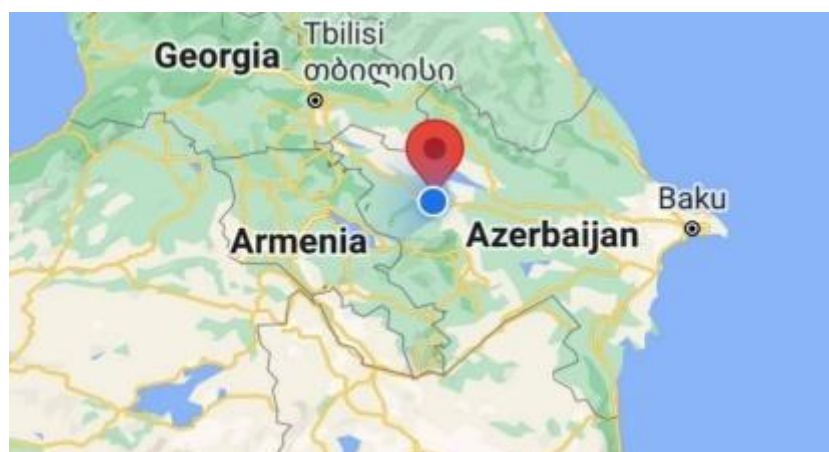


1. Introduction

As the world entered the 21st century, mankind recognized the economic and environmental importance of aluminum in a serious sense. At a time when global competition for the modern production of aluminum, which is considered the metal of the future, is expanding, Azerbaijan has taken new steps in this area. Based on the principles of industrial modernization, the experience of a number of countries and companies in the global sphere was used. Relationships were established with Chinese companies, the most important hegemonic power in the world aluminum industry, and important projects were implemented. The construction of new aluminum factories started near the town of Ganja, where the classic core had been formed.

In March 2008, with the participation of the President of the Republic of Azerbaijan, Ilham Aliyev, the foundation stone was laid for a new aluminum plant complex in Ganja [1]. According to the current project, in Azerbaijan, for the first time in the Caucasus region, construction of a large complex according to the modern technological system started. The production process of pure aluminum metal, aluminum ingots, semi-finished products, and even finished products in the form of rolls has emerged in this complex. This economic-historical event is very important for the economy of modern Azerbaijan, especially for the non-oil sector. Azeraluminium Company is the leading force in the aluminum industry in Azerbaijan. The Ganja Aluminum Complex carries out the production of aluminum primary and semi-finished products owned by the company.

Figure 1. Location of the Ganja Aluminum Complex on the Google Map.



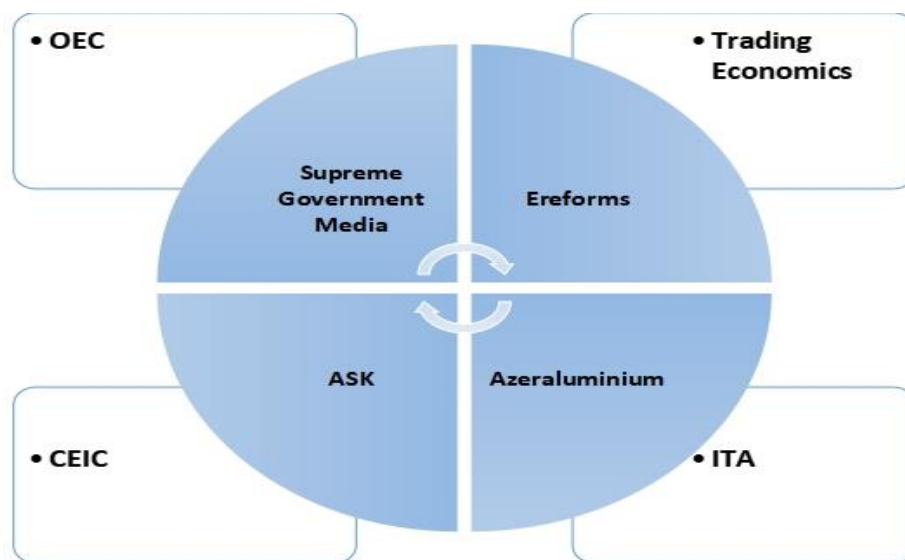
Azeraluminium LLC is a national company of Azerbaijan that exports high-quality aluminum products to the global market. Azeraluminium LLC, the only primary aluminum producer in the South Caucasus, is a leading company in the non-ferrous metallurgical industry of the Republic of Azerbaijan. In accordance with the economic plan, in 2012, Ganja Aluminum Complex's 1st phase, with an initial aluminum production capacity of 50,000 tons per year, started the production process. In the summer and autumn months of 2013, the construction and assembly works were completed at the Continuous Casting and Rolling and then the Pressure Processing and Coating plants inside the aluminum complex. In January 2014, the official opening ceremony of the last semi-finished production workshop of the complex was held [2].

The aluminum industry is one of the most important priorities of Azerbaijan's economy. In order to ensure the development of this industry, it is necessary to conduct scientific research, observe the global world, and adopt new technologies. Industrial development is the most serious factor affecting socioeconomic well-being, and with the implementation of useful missions, it is possible to make significant progress in ensuring economic well-being, which has become a major problem in the world. The development of this industry has the potential to greatly contribute to the economic cycle of society and the labor market.

2. Data background and methodology

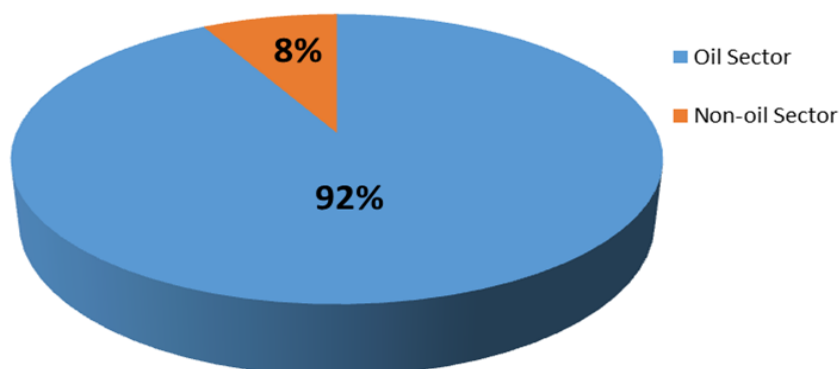
The theoretical foundations of the scientific work were created based on a general view of the modern Azerbaijani economy. The state's economic strategies were reviewed first on official platforms (President.az). A scientific article is created directly from statistical data. The necessary literature for the formation of material and methodology was obtained from a number of local (Ereforms.gov.az) and global statistical centers (Ceicdata.com). Since the article is based on the economic activity of Azeraluminium, it is necessary to obtain extensive information about this enterprise. In this regard, the research work was written on the basis of a series of investigations conducted on the official website (Azeraluminium.com) and the state institution (Ask.gov.az) to which it is affiliated, in addition to practical activities within the company. The main methodological vectors of this research are the data centers.

Figure 2. Internal and external data centers.



Azerbaijan's economy is anchored in oil and gas production, which accounted for roughly 40% of the country's GDP and over 80% of export revenue in 2021 [3]. In 2022, the foreign trade turnover of Azerbaijan was approximately 56.2 billion and the positive trade balance reached USD 27 billion dollars [4]. The total export of Azerbaijan amounted to 38.1 billion US dollars in 2022, while the non-oil sector was 8% of this total volume.

Chart 1. Share of oil and non-oil sector in Azerbaijan's exports (2022).



The share of aluminum industry in the non-oil sector is escalating. The export of aluminum and products made from it increased by 15.4% in 2022 [5]. Using the most recent research data, the role of the aluminum sector in Azerbaijan's economy was analyzed. Using the most recent research data, the role of the aluminum sector in Azerbaijan's economy was analyzed.

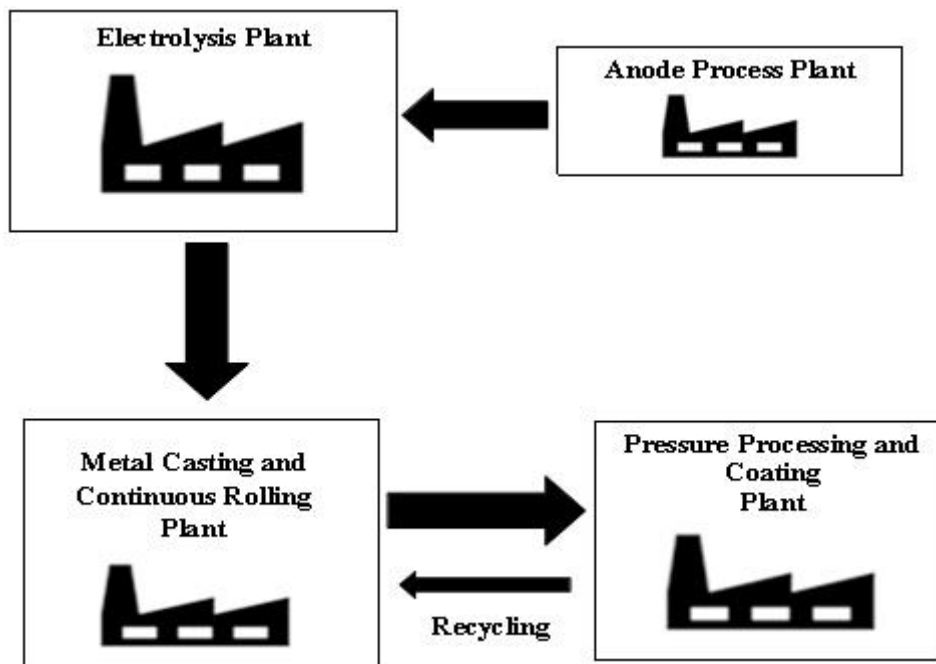
3. Results

3.1 Ganja Aluminium Complex

The total area of the Ganja Aluminum Complex is 81.0 hectares, and the total construction area is 102,000 m². The complex includes a total of four factories:

1. Electrolysis Plant
2. Anode Processing Plant
3. Metal Casting and Continuous Rolling Plant
4. Pressure Processing and Dyeing Plant

Figure 3. Ganja Aluminum Complex



Apart from these, there are 2 main auxiliary areas: 110 kV and the Silica Rectifier Substation, and the Mechanical Repair Station. The total number of employees of the complex, including all other auxiliary institutions, exceeds 1000 people. The main energy demand of the Azealuminium Ganja Aluminum Complex is met by the Mingachevir Water Power Station. In addition, a 330 kV substation was built and put into operation in order to meet the energy demand of the complex in the necessary ratios. According to the production technology, liquid aluminum is obtained by electrolysis from alumina raw materials, which are transported from the warehouse to the electrolysis plant. The anode processing plant, which is located near the electrolysis plant, supplies the anodes needed during the electrolysis process. In large kettles, this liquid aluminum is taken to the metal casting and continuous casting plant, located near the other side of the aluminum electrolysis plant, where it is poured into high-temperature furnaces. Different brands of ingots and coils are produced here from liquid aluminum. At the final production stage of the complex, the aluminum coils, which are 6–8 mm thick with hot rolling technology from the Metal Casting and

Continuous Rolling Plant, are brought to the Pressure Processing and Painting Plant, where they are thinned by a cold rolling process to 0.18 mm thickness according to the order requirements. At the same time, in the same factory, rolled sheets of different thicknesses are painted in the dyeing shop. In addition, the aluminum waste generated during the production process at the die casting and painting plant is sent to the metal casting and continuous casting plant for reprocessing. A recycling process of environmental and economic importance takes place here.

3.2 Economic indicators and future prospects related to the aluminum industry of Azerbaijan

According to the declaration of the Global Statistics Center CEIC, the total aluminum exports of Azerbaijan amounted to 190 million dollars in 2021, compared to 116 million in 2020 [6]. According to statistics published by the OEC, 64 million dollars worth of raw aluminum was shipped to the world from Azerbaijan in 2020 [7]. According to the same source, in 2020, Azerbaijan exported aluminum coatings, a semi-finished product worth \$49 million, and in the export of aluminum semi-finished products, Azerbaijan ranked 42nd in the world [8]. The main exporting countries of Azerbaijan are Turkey, USA and Russia.

Graph 1. Aluminum export of Azerbaijan (in million dollars).



Source: Trade Economics (2022) [9].

Azerbaijan's Azeraluminium company, which participates in the global economic market, produces various brands of aluminum ingots and coils. At the same time, semi-finished and fully finished aluminum products are sold at the final production stage.

Table 1. The main aluminum products and brands produced by Azerbaijan for the global market.

	Alloys					
Aluminum ingots	A0	A5	A6	A7	A8	A35
Aluminum coils	1050	1100	3003	3105	3104	8011

The development of the aluminum industry is considered one of the main state programs in Azerbaijan, and special attention is paid to it, starting from the fundamentals of this process to the next stages of development. Partnerships with China's Chinalco and the CNPT played a key role in the creation of a new aluminum industrial complex. Work was implemented together with Chinese engineers, from the preparation of the initial project for the Ganja Aluminum Complex to the installation of equipment. The machines were imported from China and assembled based on the project of the CNPT company. After the production facilities were put into operation, the Chinese engineers returned. China is also the main supplier of raw materials for the aluminum industry in Azerbaijan. Many materials are imported from China, from chemical raw materials to process equipment necessary for aluminum production.

The modern aluminum industrial chain system that has started to be established in Azerbaijan has strategies that are constantly rising and focused on production growth. In this regard, the next expansion projects of the aluminum industrial complex are considered an urgent issue. In the preliminary phase, the process of creating the first aluminum complex as a basis and the annual target of 50,000 tons of metal production were successfully implemented. The door to the next stages of production development is always open. The process started with Chinese technology and continued with Germany, the next industrial and technological giant. Economic cooperation with Germany, which is distinguished by its high technological quality in the world, is carried out through the Achenbach company. This company is characterized by an integrated production complex with the most modern equipment and technological methods in the world. It is likely that the mutual cooperation created in recent years will lead to positive results in the near and distant future. According to the contract concluded between the German company Achenbach Buschhütten GmbH and Azeraluminium LLC in July 2022, new plants will be built for the next phase of the Ganja Aluminum Complex. In the first phase of the new project, it is planned to invest 132 million dollars. The new target for the complex, which will have new production facilities to be built together with German engineers, is 105,000 tons per year. Thus, the complex, which has a production capacity of 50,000 tons and whose first phase was completed in 2014 in cooperation with Chinese companies, will double its capacity and exceed 100,000 tons [10]. At the same time, this factor will lead to an economic revival in the Ganja region and will have a positive effect on the unemployment factor. This expansion in the aluminum industry will provide the city and surrounding areas with millions of dollars in new foreign exchange and approximately 800 new jobs annually. The number of employees in this field will reach 2,000.

Chart 2. The indicator of the target production - labor force volume for the next stage of Azeraluminium LLC, the leading company of the Azerbaijani aluminum industry (2022). The bottom row represents current and the top row represents future potential.



Azeraluminium, the national brand of Azerbaijan, continues its marketing strategy by participating in a number of global events in order to sell its quality aluminum products on the world. In parallel with the meetings held in Europe with the German company Achenbach, Azerbaijan-made aluminum samples were also exhibited at the international aluminum exhibition held in Dusseldorf on September 27–29, 2022, in which more than 700 companies participated [11]. With the implementation of the second phase of the modern Azerbaijani aluminum industry along with Germany, a number of important innovations will be achieved, aluminum brands with a more sophisticated production will be produced, and Azeraluminium will more actively join the global sales market.

Table 2. The aluminum series currently producible in Azerbaijan (top) and the one that can be produced in the next stage (bottom).

1xxx	-	3xxx	-	-	-	-	8xxx	-
				*5251 with the exception			*8011 mostly	
1xxx	2xxx	3xxx	4xxx	5xxx	6xxx	7xxx	8xxx	9xxx

The Azeraluminium Company has a globally important economic platform. Domestic aluminum products sold under the Azeraluminium brand are exported to the USA, Turkey, Russia, Ukraine, Poland, Italy, Canada, Switzerland, and other countries. Semi-finished and finished aluminum materials are considered to be the most profitable export products. Aluminum materials produced on the world market are mostly used in a number of important fields related to construction, architecture, foil, packaging, machine building, electric power, and the household sector.

Azeraluminium LLC is a manufacturing company with an important share in the non-oil sector of Azerbaijan. The total export of Azerbaijan in the non-oil sector for January–December 2022 amounted to 3.05 billion US dollars, and the export index of the Azeraluminium Company for that year was 150 million dollars, which is 5% of the total non-oil sector export [12].

Chart 3. Ranking of the main state-owned exporting companies in the non-oil sector in January–April 2022 (in million dollars).



Data source: Center for Analysis and Communication of Economic Reforms of the Republic of Azerbaijan (Ereforms).

If it is not taken into account the non-oil companies affiliated with the state oil company SOCAR of Azerbaijan, Azeraluminium LLC ranks first in the country.

Chart 4. Ranking of the main state-owned exporting companies in the non-oil sector in January–December 2022 (excluding SOCAR-affiliated companies).



Data source: Center for Analysis and Communication of Economic Reforms of the Republic of Azerbaijan (Ereforms).

3.3 Future missions

The Azeraluminium Company has business strategies aimed at constantly increasing its export potential. With the new stages of expansion, the goals aimed at the aluminum industry of Azerbaijan in the future are as follows:

- To be able to carry out the production process of all kinds of aluminum alloys.
- To capture larger markets. In particular, to realize greater sales in the US market.
- To increase the volume of the non-oil sector in Azerbaijan's GDP production.
- To integrate the aluminum industry to "green" standards.

The Azeraluminium Company has a number of wide-ranging missions that will be implemented in the future in connection with the Ganja Alumina Production Area. Long-term planning includes the following goals [13]:

- In order to supply the Giltorpag (Alumina) Plant and the chemical complex with local raw materials, the launch of the "Zeylik" alunite mine located in the Dashkasan region;

- Modernization and commissioning of the Ganja Giltorpag Plant with an annual production capacity of 450,000 tons;
- Construction of a chemical complex for the production of mineral fertilizers from alunite ores
- Increasing the aluminum plant's production capacity to 200,000 tons per year;
- Construction of a calcium plant with a production capacity of 250,000 tons per year and an anode plant with a production capacity of 60,000 tons per year;
- Construction of a new aluminum recycling plant with an annual capacity of up to 40,000 tons and production of recycled aluminum;
- Power generation from alternative sources with a total project capacity of up to 400 MW
- Production of a wide range of aluminum products;

Our local specialists are conducting research on the development of the aluminum industry, and at the same time, certain new perspectives are being explored by inviting foreign experts. One of the most important projects on the main agenda is the process of obtaining aluminum oxide from alunite, a local raw material. With the implementation of this strategic project, Azerbaijan will have the potential to implement a wide range of aluminum production processes, from scratch to finished products.

4. Conclusion

There is an urgent need to conduct scientific study and analysis on the aluminum industry, which is critical to the global business environment and Azerbaijan's economy; however, this field is little researched. The primary goal of this academic work is to investigate the existing state and future possibilities of the aluminum sector in Azerbaijan from an economic standpoint.

This industry's economic development path, the foundation of modern Azerbaijan's aluminum sector, was the first demonstrated in a research study. Many essential elements have been studied, ranging from the technological framework to economic missions. The fundamental novelty of this scientific effort is the concentration on a single platform of the most important economic indicators related to Azerbaijan's aluminum industry. The primary purpose of this article is to offer a unique scientific contribution to the general economic sphere via a specific industrial chain.

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