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PROSPECTS OF INNOVATIVE DEVELOPMENT OF THE METALLURGICAL INDUSTRY OF UZBEKISTAN

N.A. Khashimova
Tashkent State Transport University

M.I.Karimov
Tashkent State Transport University

Abstract: The formation of a competitive economy in Uzbekistan is impossible without sustainable growth in industrial production. Measures are being consistently taken in the republic to improve the efficiency of the use and reproduction of the mineral resource base, to actively attract investments in order to increase the capacities of mining and processing enterprises.

The measures taken by the Government of Uzbekistan for state support of the industrial complex are focused on the implementation of the priority goal of the national economy, which is to ensure its competitiveness on the basis of innovative development. The aim of the study is to analyze the innovative activity of metallurgical enterprises, to identify trends and prospects for the innovative development of the metallurgical industry.

Key words: trends and prospects, competitiveness, competitive economy, industrial complex.

摘要：没有工业生产的可持续增长，乌兹别克斯坦就不可能形成具有竞争力的经济体。 共和国不断采取措施提高矿产资源基础的利用和再生产效率，积极吸引投资，以提高采矿和加工企业的能力。

乌兹别克斯坦政府采取的国家支持工业园区的措施，重点是实现国民经济的优先目标，即在创新发展的基础上确保竞争力。 研究的目的是分析冶金企业的创新活动，确定冶金行业创新发展的趋势和前景。

关键词：趋势与前景，竞争力，竞争经济，产业综合体。

Introduction

The metallurgical industry is one of the most important sectors of the economy of Uzbekistan, whose share in the total industrial production increased from 8.1% in 2010 to 21.6% in 2020. The annual growth rate of the metallurgical industry was 4.5%.

In the context of the COVID-19 pandemic, the industry provided significant support to the economy: in 2020, the metallurgy sector recorded an increase of 6.3%. The contribution of metallurgy to the GDP of Uzbekistan is 7.6%, the volume of metal exports is 8.2% of the total volume of export supplies. In the plans of the government of Uzbekistan, a concept is already being worked out for the development and implementation of innovative technologies for the production of lead-calcium, lead-nickel and

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About the authors：N.A. Khashimova

Corresponding author- *Email:

other types of alloys (using rare earth metals) based on local raw materials.

The dominant enterprises in the industry are Almalyk MMC and Navoi MMC. Each of the factories extracts and processes raw materials, and is also actively involved in the implementation of investment projects aimed at expanding production.

Metallurgical production is a socially significant type of economic activity, since many large metallurgical enterprises are city-forming, which means that their condition directly affects various spheres of life of a city or an entire region, such as: “transport infrastructure, housing and utilities ..., employment and social security of the majority of citizens, development of related industries ..., construction of social facilities, environmental protection, health care, development of the service sector ”[1]. Thus, the socio-economic significance and the need for sustainable growth of enterprises in the metallurgical industry of Uzbekistan determine the relevance of the problems considered in the article by the authors.

Key performance indicators and development problems of AGMK

Almalyk Mining and Metallurgical Combine JSC (AGMK) is an enterprise with huge potential. In the entire post-Soviet space, few enterprises will be able to compare with it in terms of the size of the occupied territory, the scale of activity, the level of profitability, the volume of production areas, the range of products, the number of personnel and the amount of funding for social programs. It is the largest mining and processing enterprise in the Central Asian region and in the world, whose role in the economy of Uzbekistan is huge.

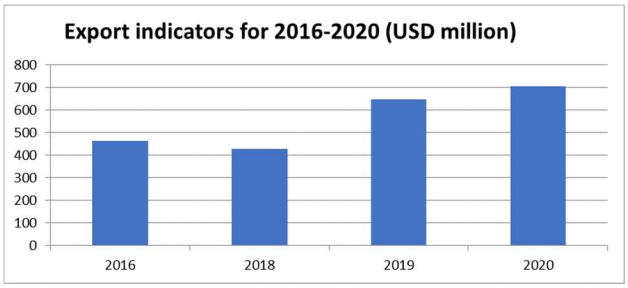
Almalyk MMC JSC has been a large and profitable enterprise for more than half a century, which allows it to occupy a stable position in the non-ferrous metals market.

The production structure of Almalyk MMC JSC is oriented in three directions: copper-molybdenum, lead-zinc and gold mining enterprise with two gold-extracting factories, the concentrate of which is processed at the copper smelting plant of the combine.

During the period 2016-2020, AGMK has seen an increase in production volumes. In particular, in comparison with 2016, an increase in volumes was provided in 2020:

- ore production by 106.4% (from 37.2 million tons to 39.6 million tons);
- като cathode copper output by 113.0% (from 103.9 thousand tons to 117.4 thousand tons);
- цинка zinc output by 112.5% (from 61.7 thousand tons to 69.5 thousand tons);
- цемента cement production started in 2014 and by the end of 2020 the output reached 1.1 million tons [5].

Exports during the period under review show an increase in the volume of supplies of copper and zinc products due to an increase in production volumes and the expansion of the sales market.



In 2016-2020, as part of the implementation of investment programs, a total of investments in the amount of $ 1015.2 million

were disbursed and 21 facilities were put into operation. Due to the investment activity, the technological upgrade of the main production units of the combine (MPZ and MOF) was carried out for a total amount of $ 355.2 million. and the production of new types of finished products with added value has been mastered: copper pipes, Portland cement, copper wire. At the same time, joint foreign enterprises have been established and are functioning with the participation of investments of Almalyk MMC JSC and foreign partners:

- on the territory of the SEZ "Jizzakh" for the production of 1.2 million pieces of plumbing products (7.5 million dollars) and 3.0 million pieces of handles for faucets;
- on the territory of the SEZ "Navoi" for the production of 10 thousand km of high-voltage power cables per year.

In order to improve the energy efficiency of production, projects totaling more than $ 13 million have been implemented, which allows for annual energy savings of 15 million kWh to date. According to the localization program, to date, the production of over 80 different types of products has been mastered, including spare parts for mining, crushing and grinding, processing and other equipment, as well as value-added products obtained through deep processing of local raw materials " [4].

The main factors of the achieved results are:

1. Active investment activity, which allowed:

- expansion of mines ores;
- commissioning of new technological capacities, including a sulfuric acid workshop and a melting furnace at a copper smelter, cement plants in the Jizzakh and Surkhandarya regions;
- reconstruction and modernization of existing facilities (zinc plant, crushing and grinding department of a copper concentrating plant, oxygen and compressor stations at a copper smelter).

2. Favorable situation on the world market for non-ferrous metals (rising prices for copper and zinc), which stimulated an increase in export volumes.

3. "Construction boom" in the republic, which stimulated the growth of volumes of production and sales of cement.

4. Liberalization of the exchange rate of the national currency, which affected the volume of marketable products in current prices.

At the current stage of development, the urgent problems that need to be addressed are:

1. Gradual disposal of reserves of the Kalmakir open pit with a high metal content and a transition to the extraction and processing of ore with a low content, which requires an increase in production volumes to maintain the current level of metal production.

2. Disposal of reserves of small deposits of the plant

3. Moral and physical deterioration of the main equipment of the basic production units (MOF, MPZ, Zinc Plant, UAT, UPZhT).

4. The need to provide new large technological facilities with electricity, natural gas and industrial water: MOF-3 and the Yoshlik 1 open pit.

5. In connection with the increase in the volume of shipment of products (200 thousand

tons of copper and 100 thousand tons of zinc), the issue of establishing an effective shipping system needs to be resolved (the existing prevailing system of 39 shipments by road does not allow shipment of specified volumes, and the existing system of railway shipment not rated for power data)

6. Diversion of financial resources of JSC "Almalyk MMC" for participation in social projects in the regions of the republic, which leads to an increase in the costs of the plant "[4].

Today in the metallurgical industry the emphasis is on "the transition from price competition to quality competition." The fight for the market becomes more important than the fight for profit. Market power is transferred to countries and companies with competencies in the development of new technologies and equipment ”[2]. The main issue of sustainable growth of modern metallurgical production in Uzbekistan is the activation of innovation and investment activities.

Innovative activity of metallurgical enterprises

In accordance with the Concept of socio-economic development of Uzbekistan until 2030. clusters should be the main object of government policy to stimulate innovation. The application of the cluster approach is considered as an effective form of functioning of complex economic systems and as one of the most effective ways of developing territories ”[6].

At the same time, many methodological and methodological aspects of the formation of clusters, and, in particular, mining and metallurgical ones, have not yet been sufficiently studied. For example, questions such as:

substantiation of the strategy for the creation and development of a specific mining and metallurgical cluster;

development of a mechanism for the formation of a mining and metallurgical cluster, taking into account industry specific features and allowing the formation of the most promising directions for the development of the region;

organization of interaction between participants within the mining and metallurgical cluster;

development of measures and a mechanism of state support for the cluster development of the mining and metallurgical industry of the country, etc. ”[3].

The scientific and practical significance of the above issues predetermines the need to continue relevant scientific research.

In the context of globalization and increasing competition, the development of the economy of Uzbekistan largely depends on the sustainable and effective development of each industry. The metallurgical industry is the basis for the development of the economy of the country and its regions.

Non-ferrous metallurgy of Uzbekistan is concentrated in the Angren-Almalyk mining and industrial region. The most significant enterprise in this industry is the Almalyk Mining and Metallurgical Combine.

Today, in JSC Almalyk MMC for the extraction and processing of ores, noble and non-ferrous metals, it is a complex industrial complex, which includes six mines (the Kalmakyr deposits are made up of copper, molybdenum, noble metals, as well as sulfur, selenium, tellurium, rhenium. gold-bearing ores of the Koch-Bulak, Kyzyl-Alma, Kairagach., Chadak mining administration, Khandizinskoe mining administration zinc, copper, lead

concentrates, Kauldy mine, Uch-Kulach deposits, mine construction department, Kyzylkum five phosphate complex LLC copper concentrating plant, Angren gold recovery plant, Chadak gold recovery plant, Khandiza concentrating plant), three metallurgical plants, Angren tube plant mainly focused on the export of copper pipes, and Jizzakh and Sherabad cement plants.

Table 1

Indicators of innovative activity of the Almalyk Mining and Metallurgical Combine

Indicators	2016	2018	2020
Goods shipped and works and services performed on our own, billion soums	2979	9428	23323
Including innovative goods, works, services, mln UZS	148,9	562	1652
Share of innovative goods, works, services,%	5	6	7,1
The share of goods newly introduced or undergoing significant technological changes in the total volume of innovative goods, works, services over the past 3 years,%	35	47	63
The share of innovative products related to nanotechnology in the total volume of innovative products, works, services over the past 3 years,%	12	16	19
Number of enterprises implementing technological innovations, units	18	18	18

Source: Compiled and calculated by the authors based on data from the State Statistics Committee of the Republic of Uzbekistan

The innovative activity of the metallurgical industry is also reflected in the indicator of the volume of investments in fixed assets, which has a positive trend. Thus, investments in fixed assets of innovatively active metallurgical enterprises in the period 2017-2020 amounted to 330 million US dollars. It should be emphasized that in 2017 2020. the share of investments in fixed assets of metallurgical enterprises implementing technological innovations in the total investment of metallurgical enterprises in Uzbekistan amounted to 27.0%, 50.6% and 67.6%, respectively, which reflects a positive trend, since it is technological innovations that make up the main share in the structure innovations in metallurgical production ”[5].

Table 2

Almalyk Mining and Metallurgical Combine Innovation Costs

Indicators	2016	2018	2020
Costs for technological, organizational and marketing innovations, mln UZS	589	895	1020

Including costs for technological innovations by funding sources, million soums, of which:	162	453	690
share of costs for technological innovation in total costs,%	27,0	50,6	67,6
own funds, mln UZS	162	453	690
share of own funds in the total amount of financing, mln UZS	-	-	-
State budget, mln UZS	-	-	-
others (credits, loans, foreign investments), mln UZS	-	-	-

Source: Compiled and calculated by the authors based on data from the State Statistics Committee of the Republic of Uzbekistan

Trends and prospects of innovative development of Almalyk MMC

Based on the analysis, the following trends in the innovative development of the Almalyk MMC can be identified:

- an increase in absolute terms in the volume of shipped innovative goods;
- growth of investments in fixed assets of innovatively active metallurgical enterprises;
- a high proportion of investments in fixed assets of metallurgical enterprises that carry out technological innovations in the total volume of investments of all metallurgical enterprises;
- growth of costs for technological innovations;
- an increase in the costs of metallurgical organizations for technological innovation at the expense of the state budget;
- growth of costs for product innovations in metallurgical production.

The strategic task of the metallurgical industry of Uzbekistan is to involve in the national economic circulation the explored iron ore resources of the regions with the appropriate resources and the availability of fuel and energy capacities, and the creation of new capacities in its undeveloped territories, which will make it possible to implement the concept of the dispersed development of the industry throughout the country.

The strategy for the development of the metallurgical industry in Uzbekistan should be determined through a cluster approach, both in the sectoral and territorial aspects.

To implement the strategic directions of long-term development, it is necessary to conduct an active investment policy along with an effective monitoring system, which provides for:

allocation of approved funding limits on an annual basis;

search for additional borrowed sources of financing at a low interest rate;

targeted use of allocated funds;

taking appropriate measures to eliminate emerging problematic issues;

 Creation of an electronic system for monitoring the achievement of target parameters and the execution of the timing of activities.

Timely implementation of measures in each of the areas will allow the integrated development of the plant and achieve the following results in 2030 in relation to 2020:

 commissioning of more than 10 large and modern technological facilities worth more than $ 1.9 billion.

 growth in the volume of industrial production and bringing the export of products to 550 million dollars;

 providing employment for over 10 thousand people;

 an increase in the areas of implementation of information technologies in production processes with an increase in the level of automation of technological processes;

 reconstruction of all large and commissioning of new social facilities in Almalyk (educational and medical institutions, sports complexes) [5].

Conclusion

Despite the problems arising in the process of implementing innovative solutions, sustainable growth of the metallurgical industry in Uzbekistan is possible only when it moves to an innovative development trajectory. At present, on the basis of the Decree of the President of the Republic of Uzbekistan dated June 24, 2021 No. PP-5159 "On additional measures for the development of the mining and metallurgical industry and related industries", the main directions of the innovative development of the metallurgical industry are:

- expanding the dissemination of innovations and active interaction with industries - consumers of metal products, primarily those that have significant state capital (including the military-industrial complex, fuel and energy complex, automotive industry, railway transport);

- energy saving;

- strengthening the position of metallurgists in the world markets;

- revival and development of production of high-quality metal products in short supply for the military-industrial complex;

- improving the environmental performance of metal products;

- introduction of environmentally friendly technologies;

- outstripping development of the ore base of the metallurgical industry ”[5].

There is no doubt that active government support and effective management, focused on the formation of a strategy for innovative development in metallurgical production, will allow the industry to restore its leading positions and increase the level of competitiveness.

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