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Annotatsiya. Maqolada O'zbekiston sement sanoati tahlili va sharhi keltirilgan. Mualliflar tomonidan qurilish ishlari hajmi, ishlab chiqarish hajmlari va xom ashyo birjasidagi sement mahsulotlari sotish hajmlari tahlil qilinib, hamda 2019-2025 yillarga rejalashtirilgan sement mahsulotlari ishlab chiqarish maqsadli parametrlari o'rganilgan. Alohida sement ishlab chiqarish jarayoni quruq va ho'l texnologiyalari, hamda ularning afzallik va kamchiliklariga ta'rif berilgan.

Аннотация. В статье проведен обзор и анализ цементной промышленности Узбекистана. Авторами проанализированы объемы строительных работ, объемы производства и реализации на бирже цементной продукции, а также целевые параметры производства цементной продукции в 2019-2025 годах. Особое внимание уделено технологическому процессу производства цемента, в частности сухому и мокрому способам. Подробно представлены преимущества и недостатки каждой технологии производства.

Abstract. The article provides an overview and analysis of the cement industry in Uzbekistan. The authors analyzed the volume of construction work, the volume of production and sales of cement products on the exchange, as well as the target parameters of the production of cement products in 2019-2025. Particular attention is paid to the technological process of cement production, in particular dry and wet methods. The advantages and disadvantages of each production technology are presented in detail. The authors reviewed the existing and projected cement manufacturing enterprises in Uzbekistan.

Kalit so'zlar. Sement sanoati, texnologiya, quruq ishlab chiqarish texnologiyasi, ho'l ishlab chiqarish texnologiyasi, klinker.

Ключевые слова: Цементная отрасль, технологии, сухая технология производства, мокрая технология производства, клинкер.

Key words. Cement industry, technologies, dry production technology, wet production technology, clinker.

Introduction. The construction industry occupies a special position in the economy of any country. Construction, as part of the economy, is involved in the creation and modernization of fixed assets for all other sectors of the economy, and thus is a key fund-forming industry. Therefore, the effective and stable development of the construction industry - the cost and timing of construction and modernization of fixed assets of the economy - determines the ability of the country's economy to accelerate development and the pace of solving the most important socio-economic problems. Thus, investment in housing construction is a more important driving force of the economy of developing countries than investment in other sectors, primarily due to the high multiplier effect of the construction sector.

As a result of deepening economic reforms aimed at creating a favorable business environment, modernization, technical and technological renewal of production, the economy of the republic since 2000 has been

demonstrating high and sustainable rates of economic growth at the level of 7-9% per year. Even despite the global pandemic in 2020, the economy of Uzbekistan showed positive growth of 101.6%, although there was a decline in economic growth worldwide.

In light of these events, a special role was assigned to the construction materials industry, which is an area that determines the potential of the construction industry as a whole. This area forms 55-70% of the cost of construction and installation work, which assumes more than half of all investment in the economy.

To establish the relationship between the dynamics of GDP and the volume of construction (which is a key indicator of this industry), we compared the data in the diagram in Figure 1.

Material and methods. The achieved level of cement production of about 9000 thousand tons per year (as of 2018) is not able to meet market needs. As shown in Table 1, the volume of construction work is growing

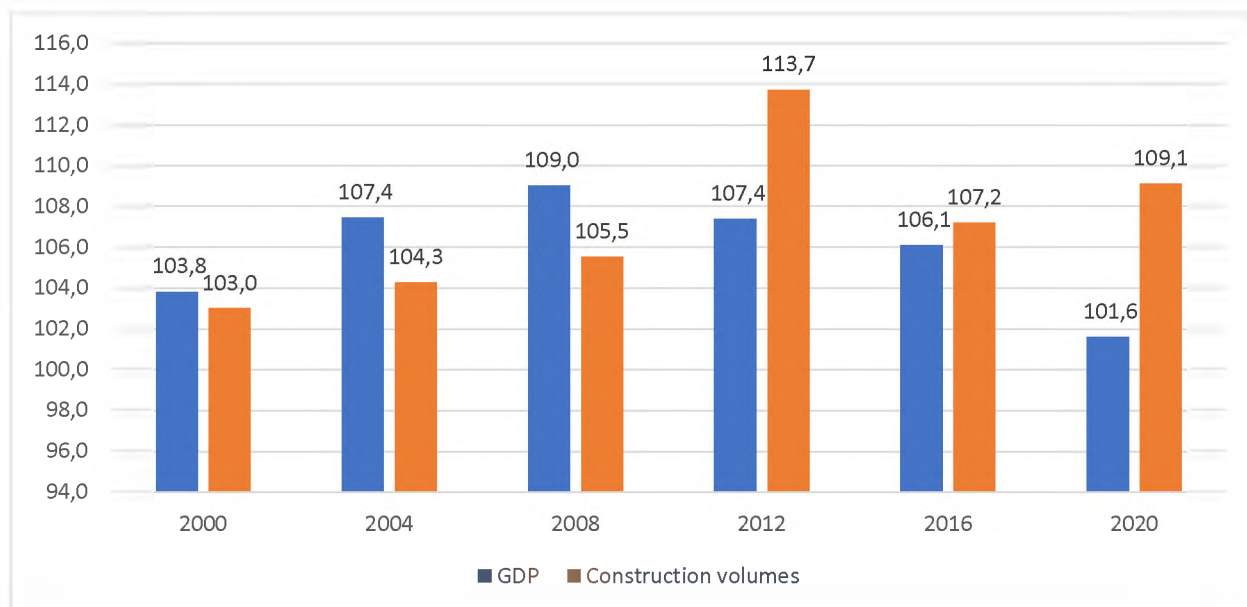


Figure 1. Growth rates of GDP and construction volumes in Uzbekistan in 2000 - 2020, in % of the previous year (source: State Statistics Committee of the Republic of Uzbekistan)

Analyzing the above indicators, one can see that there is a stably positive dynamics of growth in construction volumes and similarly repeated rates of GDP growth, but with a slightly different amplitude. As a result of the pandemic, at the end of 2020, GDP growth amounted to 101.6%, while the volume of construction work increased by 109.1% compared to the previous year [1].

In order to further improve the construction industry, form mechanisms for the consistent development of architecture and construction institutions, ensure the efficiency of the public administration system, progressive implementation in the field of digital technologies; the President's decree approved the Strategy for modernization, accelerated and innovative development of the construction industry of the Republic of Uzbekistan in 2021 - 2025 [2].

The republic is also carrying out large-scale work to further deepen structural reforms in the construction materials industry, aimed at ensuring sustainable growth rates of production and export of competitive products, as well as modernization, technical and technological renewal of enterprises.

every year, over 20 years from 388 billion Uzbek soums in 2000 to 65,154.6 billion Uzbek soums in 2020, which indicates significant economic growth in the industry.

In order to optimize the volume of supplies, stable and rhythmic satisfaction of the needs of the sectors of the economy of the republic in cement, including the implementation of the most important nationwide development and modernization programs and large investment projects, the Cabinet of Ministers of the Republic of Uzbekistan annually approves the balance of production and consumption of cement.

In order to create favorable conditions for the accelerated development and diversification of the industry, attracting investments in the processing of local mineral raw materials and increasing the export of construction materials, the government approved the forecast parameters for expanding the raw material base of the construction industry. Based on geological exploration, production and processing of local raw materials in 2019-2025 and Target parameters for the production of construction materials in 2019-2025, taking into account the diversification and expansion of the range

of products, it is envisaged to increase the production of wallpaper by more than 47 times, aerated concrete blocks - 7 times, paint and varnish materials - 4 times, composite reinforcement rebar and basalt - 3 times and cement - 2 times [3].

These target parameters were developed by the government taking into account the increasing demand for construction products. According to the Resolution, it is planned to systematically increase the volume of cement

declared. For the construction of facilities financed from centralized sources, cement is supplied at the declared price, and for other consumers, cement is sold through exchange trading at free (market) prices.

Results. Cement, being a semi-finished product from the group of construction materials, is a priority in the development of the construction industry. The process of cement production itself is capital and energy

Table 1.

Target parameters for the production of cement products in 2019-2025, taking into account the diversification and expansion of the product range (in thousand tons)

The name of indicators	2018 (fact)	Forecast							Dynamics, in 2025 by 2018 (%)
		2019	2020	2021	2022	2023	2024	2025	
Cement, including high quality and special types based on energy saving technologies	9 080	10 984	13 400	16 400	19 100	19 500	19 900	20 260	223,1

Source: Resolution of the President of the Republic of Uzbekistan PP-4335 of 23.05.2019 "On additional measures for the accelerated development of the construction materials industry."

production in the country by more than 2 times. The production plan was at the level of 10,984 thousand tons of cement in 2019, and in fact, 10,549.8 thousand tons of cement were produced in the republic (Table 1), which indicates that the planned volumes were not fulfilled due to the temporary suspension of cement production at the end of 2020 at Kuvasaycement JSC and Akhangarantsement

intensive. The creation of advanced technologies with minimal expenditure of material and energy resources is one of the main tasks of the construction industry, which includes the production of construction materials and products. In order to understand the features of production, we will further consider in more detail the technological process of cement production [7].

Table 2.

Indicators on production volumes, sales and price indices of cement in Uzbekistan for 2016-2019[5,6]

	2016	2017	2018	2019
Cement production in Uzbekistan (thousand tons)	8645,9	9132,2	9080,4	10549,8
Sale of cement at the commodity and raw materials exchange of Uzbekistan (mln. Soums)	2435307,3	2330384,6	5546717,0	4839813,1
Price index (December to December of the previous year; percentage)	135,7	122,1	97,9	119,9

Source: State Statistics Committee of the Republic of Uzbekistan

JSC, due to the decrease in gas pressure supplied to cement producers [4].

All large cement enterprises of the republic are included in the register of monopolists, and the value of their products is

Cement production technologies. The technological process for the production of Portland cement includes the following main operations: extraction of raw materials; preparation of raw mix; burning of the raw

mixture and obtaining clinker; grinding clinker with additives and obtaining cement. The process of preparing the raw mixture includes the operations of crushing the raw material, fine grinding, averaging and adjusting the raw mixture.

Depending on the type of preparation of raw materials for firing, a distinction is made between wet and dry methods for the production of Portland cement clinker. How is the wet method of cement production different from dry?

The so-called "wet" and "dry" technologies for cement production are the most common methods of obtaining this irreplaceable building material.

- In the CIS countries and in Uzbekistan, in particular, cement plants use mainly the "wet" method, while almost all foreign manufacturers of the binder work according to the "dry technology".

- Differences between wet and dry cement production technology

- Both technologies have their advantages and disadvantages. The main disadvantage of the wet method of cement production is the significant energy consumption of the process, which is reflected in the cost of the final product. Dry technology is distinguished by a greater environmental hazard and, accordingly, high capital costs to eliminate this factor. Let's consider both methods of cement production in more detail.

The technological scheme of the wet method provides for separate primary processing of clinker components. The crushed "ingredients" are loaded into special equipment for short-term exposure under a layer of water. After that, the components of the clinker, in wet condition, go into special mills, where they are ground to a powder state and thoroughly mixed.

The sludge prepared in this way is fed into vertical and horizontal "sludge pools" to adjust the required ratio of "ingredients". The next technological operation is the furnace roasting of the corrected sludge and cooling by industrial refrigeration units. The resulting clinker is crushed to a fine powder - cement. Further, the following are carried out: laboratory analysis for the conformity of cement to the requirements of GOST (local

standard), packing and sending to the consumer.

Advantages of wet technology:

- Lower technological costs for grinding raw materials. Components such as chalk and clay are well soaked in water during initial treatment in pools. Accordingly, the process of grinding them is much simpler and easier;

- Transportation, homogenization and adjustment of sludge is easier and more environmentally friendly than similar operations with dry technology;

- Many times less dust formation;

- The design of sludge kilns is simple, reliable and has a high Space Utilization Rate - from 0.89 to 0.91;

- There is a fundamental possibility of using raw materials of "variegated" chemical composition and good homogenization of the sludge.

Disadvantages:

- Large specific consumption of heat energy for burning raw materials for cement production. Raw materials supplied for roasting have an average moisture content of 35-45%. Accordingly, for the evaporation of moisture and heating of the components, about 5 450-6 800 kJ / kg of thermal energy or 35% of the thermal power of the furnace are required. Therefore, part of the kiln works as a drying unit with all the ensuing "troubles";

- High material consumption of kilns with low productivity.

These disadvantages translate into relatively low labor productivity, significant technological and operating costs, leading to a relatively high production cost.

According to the "dry" technology, the main production and technological equipment is similar to the wet process. The changes consist in a fundamentally different technological scheme of clinker production. After pre-crushing, the clinker components are fed into drying drums, with each component being fed into a separate drum. After drying, the "ingredients" are mixed and fed to a common mill for further grinding and adding additives.

The next operation is determined by the type and moisture content of the clay. All other components are adjusted to the specified clay parameters. The essence of the operation consists in a slight moistening (no more than

13% moisture content) of the sludge and subsequent feeding for firing. Accordingly, low humidity energy costs for firing are small, and the furnaces are less metal-consuming and less overall. The operations following sludge firing are similar to the previous cement production method.

Advantages of dry technology:

- Relatively low specific consumption of thermal energy consumed for clinker burning - 2,900-3,700 kJ / kg;

- 30-40% less volume of furnace gases at the same performance and the possibility of their reuse for drying components. This allows to significantly reduce energy consumption for the production of clinker and requires less capital investment in dust removal;

- Relatively lower metal consumption of kilns with higher productivity in comparison with "wet" technology. The production capacity of furnaces in the "dry" method is from 3,000 to 5,000 tons of product per day, which is 100-200% more powerful than similar equipment operating on the basis of the "wet" technology;

- There is no need for powerful sources of process water.

Disadvantages:

- Many times higher dust emission, which makes it difficult to ensure sanitary standards and the environmental protection of the surrounding area;

- Relative complexity of the design of the kilns;

- The "capriciousness" of the kilns in relation to fluctuations in the chemical composition of raw materials, their dispersion and degree of importance;

- Relatively low utilization rate of furnaces - from 0.7 to 0.8;

Higher labor and energy consumption for grinding components due to their low moisture content [8].

In recent years, large-scale work has been carried out to reform the sector, improve the efficiency and potential of enterprises. From a critical point of view, the activity of each enterprise is analyzed, on a systematic basis, work is underway to reduce the cost of

production by improving the quality and production of energy-saving, innovative construction materials. The enterprises use digital technologies, automated processes dangerous to human life. Special attention is paid to the development of new directions in the production of construction materials and the attraction of foreign investors into this process, the development of new types of products and the attraction of innovations to the [8].

Conclusion. Construction, as part of the economy, is involved in the creation and modernization of fixed assets for all other sectors of the economy, and thus is a key fund-forming industry. Cement is a semi-finished product from the group of construction materials and occupies the most important direction in the development of the construction industry. The cement production process itself is capital intensive and energy intensive. Distinguish between wet and dry methods for the production of Portland cement clinker, which are the most common methods for obtaining this irreplaceable construction material. The creation of advanced technologies with minimal expenditure of material and energy resources is one of the main tasks of the construction industry, which includes the production of construction materials and products. In a number of Western European countries and Japan, due to the high fuel consumption, the wet method is completely absent, 100% of the cement is produced using an economical dry method. In the USA, Canada, many countries, the dry method prevails, in which 60-80% of factories operates. At the same time, the cement plants of the country mainly use the wet method of production. Since the main large cement producers are Kyzylkumcement, Akhangarantsement, Kuvasaycement, Bekabadcement joint stock companies, they operate on the basis of technological lines that were designed back in the 1960s. It is planned to commission new production facilities, taking into account modern technologies, in order to increase the volume of cement production in the country.

REFERENCES

1. <https://stat.uz/ru/ofitsialnaya-statistika/construction>

2. Decree of the President of the Republic of Uzbekistan UP-6119 dated November 27, 2020. "On approval of the Strategy for modernization, accelerated and innovative development of the construction industry of the Republic of Uzbekistan for 2021-2025."
3. Resolution of the President of the Republic of Uzbekistan PP-4335 05/23/2019 "On additional measures for the accelerated development of the building materials industry."
4. «O'zbekiston sanoati. Промышленность Узбекистана» - O'zbekiston Respublikasi davlat statistika qo'mitasi, Toshkent, 2020
5. «O'zbekistonda narxlar 2015-2019. Цены в Узбекистане 2015-2019» - O'zbekiston Respublikasi davlat statistika qo'mitasi, Toshkent, 2020
6. «O'zbekistonda qurilish 2016-2019. Строительство в Узбекистане 2016-2019» - O'zbekiston Respublikasi davlat statistika qo'mitasi, Toshkent, 2020
7. Khairova, D. R. Assessment of the export potential of the cement industry of Uzbekistan / D. R. Khairova, M. I. Sayfullaeva. - Text: direct // Innovative economy: materials of the I International. scientific. conf. (Kazan, October 2014). - Kazan: Buk, 2014 - S. 206-208. - URL: <https://moluch.ru/conf/econ/archive/130/6228/>
8. <https://salecement.ru/chem-mokryj-sposob-otlachaetsya-ot-suhogo/>

УДК 332.

ANALYSIS OF HOUSING POLICY DEVELOPMENT IN UZBEKISTAN

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Annotation. In the article, the author analyzed the reforms carried out over the years of independence in the field of housing policy to adapt the living conditions of the population to modern standards of housing comfort, as well as the contribution made to economic development and structural improvement in the areas of housing construction and housing services.

Аннотация. Мақолада муаллиф томонидан истиқлол йилларида уй-жой сиёсати соҳасида амалга оширилган ислохотлар, аҳолининг яшаш шароитлари уй-жойларда яратилган қулайликларни замонавий стандартларига мослаштириши, шунингдек уй-жой қурилиши ва уларга хизмат кўрсатиши соҳаларидаги иқтисодий ривожланиши ва тўзилмавий такомиллаштиришига борасида амалга оширилган ишлар таҳлил қилинган.

Аннотация. В статье автором были проанализированы реформы, проводимых за годы независимости в области жилищной политики по адаптации жилищных условий населения к современным стандартам жилищного комфорта, а также внесенного вклада в экономическое развитие и структурное совершенствование в сферах жилищного строительства и жилищных услуг.

Keywords: housing policy, housing and communal infrastructure, housing construction, housing and communal sphere, housing services, investment, innovation, management, economic development, structural improvement.

Калит сўзлар: уй-жой сиёсати, уй-жой коммунал инфратўзилмаси, уй-жой қурилиши, уй-жой коммунал хўжалиги, уй-жой коммунал хизматлар, инвестициялар, инновациялар, менежмент, иқтисодий ривожланиши, таркибий такомиллаштириши.

Ключевые слова: жилищная политика, жилищно-коммунальная инфраструктура, жилищное строительство, жилищно-коммунальное хозяйство, жилищные услуги, инвестиции, инновации, управление, экономическое развитие, структурное совершенствование.

Introduction. Macroeconomic development largely determines the possibilities and scale of efforts in the field of housing policy to adapt the living conditions of the population to modern standards of housing comfort. On the other hand, through innovative and labor-intensive investments in buildings and related municipal infrastructure, effective housing policies can make a significant contribution to economic development and structural improvement,

especially in the construction, construction products and housing services sectors [1].

Following the privatization of the 1990s, which was mostly free of charge, the ownership structure of housing is 98% private small-scale residential property (apartment owners). Currently, the state owns only 2% of the housing stock for social security of the population. Of the approximately 35000 apartment buildings built since 1967, about 18600 are brick and 14600 reinforced concrete. Wooden buildings and other

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