DIRECTIONS OF ACTIVATION OF INNOVATIVE ACTIVITIES AT BUILDING MATERIALS ENTERPRISES

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Abstract. *The building materials industry occupies an important place in the investment and construction cycle. The cost, timing and quality of construction depend on the level of provision of construction with modern, efficient building materials. In our country, this industry has its own characteristics, and significant results have been achieved in this area in recent years in the form of growth in production volumes, expanding the range of products, and updating the material and technical base of the industry. The basis of its effective development is the activation of innovation activity. Based on the analysis of the potential of the industry and a number of developments, the article substantiates the directions of innovative development.*

Key words: *Building materials industry, innovative development, activation, organizational and economic measures for effective development.*

1. Introduction.

Today, Uzbekistan is undergoing a period of construction and modernization. In this process, the industry, especially the construction industry, is developing rapidly. The production, supply and construction of construction raw materials is one of the most profitable industries.

In particular, the Resolution of the President of the Republic of Uzbekistan No. PP-4198 "On measures to radically improve and comprehensively develop the construction materials industry", further reduce the state's participation in the economy, increase the efficiency of the construction materials industry, deep processing of local raw materials. Action Strategy for the five priority areas of development of the Republic of Uzbekistan in 2017-2021 and in order to consistently implement the tasks set out in the Concept of Administrative Reforms in the Republic of Uzbekistan.

In 2021, 3.8 trillion sums will be allocated from the national budget for the allocation of credit lines to commercial banks involved in financing the program of affordable housing. 300 billion sums have been allocated to the Public Fund for Women and Family Support.

2. Literary review.

The construction industry is the only industry in Uzbekistan that exists all over the world and never loses its demand. In this industry, the processes of extraction, production and processing of raw materials are in the forefront.

For this reason, both foreign and Uzbek scientists have conducted research on the production of building materials and the application of innovations in them.

Chinese scientists Zhu and Hu (2019) wrote in their article Driving Factors of Green Supply Chain Management in Building Materials Enterprises, "With the deterioration of the ecological environment and the improvement of consumers' green awareness, the government and society put forward higher requirements for the green supply chain management of building materials enterprises. Some enterprises have already begun to implement green supply chain management, which brings pressure to other enterprises".

Kościelniak and Puto (2014), world scientists, have studied the following in their work: The empirical studies attempted to determine which of the factors contributed to the greatest extent to changes in return on equity and how important was the role played in this respect by changes in financial liquidity in joint stock companies in the sector of building materials under conditions of crisis.

Hrustalev and Uchaeva (2015), in their research, noted the need to innovate in the

activities of enterprises engaged in construction materials, to save costs in the storage and transportation of raw materials, to design. In this way, construction companies can achieve efficiency.

Secher, Linnet (2018) said that the building industry needs transparency of its environmental impacts to make informed decisions. Nevertheless, many material and product manufacturers have not produced Product Environmental Footprint (PEF), Environmental Product Declarations (EPD) or similar evaluations of the environmental life cycle impact.

Liu and others (2021) also conducted research on the construction and protection of houses in wetlands due to the importance of technological innovation in the construction industry, today's population growth and limited land use.

3. Research methods.

This article provides an analysis of innovative activities in the construction materials industry, which in recent years has analyzed the dynamics of production of construction materials in the Republic by analysis and synthesis methods. In addition, deductive and inductive methods were used in the analysis process.

The analysis also lists innovative areas of activity that can be introduced and used in the construction industry.

4. Analysis and results.

The building materials industry occupies a special place in the investment and construction chain. Its special role is indicated by various sources (Zainutdinov, Nurimbetov, 2017). Significant results have been achieved in the industry over the years of independence: the range of products has been expanded, production volumes have been increased (Table 1), product quality has been improved, the use of advanced technologies has been expanded, and a significant increase in the competitiveness of the industry has been ensured.

Table 1.

Dynamics of production of a number of building materials in the Republic of Uzbekistan for 2016-2019[1]

N	Name of materials	Unit	Years			
			2016	2017	2018	2019
1	Cement	thousand tons	8645,9	9132,2	9080,4	10763,8
2	Ceramic tile	thousand sq.m	262,6	245,6	1894,0	9596,1
3	Dry builds mixes	thousand tons	183,9	245,1	762,4	846,7
4	Drywall	thousand sq.m	29250,0	29271,7	38437,2	49243,9
5	Paint and varnish products	thousand tons	38,3	35,8	49,2	130,4
6	Building glass	t.sq.m	7283,0	7348,0	9295,8	16853,9
7	Brick builds	million pieces	1333,4	1379,0	1704,2	1267,2

Note that for many positions in Table 1, the growth over these years amounted to hundreds of percent. The decline in brick output is due to energy saving considerations.

In our country, this industry has its own characteristics and its further sustainable development should be based on an innovative approach.

It should be noted that at present the world community is on the verge of the fourth technological revolution. Even now, in developed countries, more than 2/3 of the gross domestic product is created on the basis of the development of innovative activities. Table 2

[1] Statistics. List of countries by GDP per capita. World Bank data [Electronic resource] - Access mode: = https: // Expert/ru

shows data on GDP and R&D expenditures for a number of countries. Calculations show that between these pairs of data there is a fairly close straight-line correlation with the correlation coefficient R = 0.6341). That is, in countries where large financial support is given to innovation and research activities, a high level of the most important macro-indicator is ensured.

Table 2.

GDP per capita and R&D expenditure data for selected countries[2]

N	The country	GDP per capita, in USD*	R&D spending in % of GDP**
1	South Korea	34422	4,23
2	China	40866	3,29
3	Japan	47999	2,88
4	France	41178	2,23
5	USA	56207	2,79
6	Japan	14448	2,07
7	United Kingdom	41767	1,7
8	Brazil	15615	1,17
9	Russia	23703	1,13
10	India	6127	0,63

In modern Uzbekistan, innovative development is becoming one of the key areas for increasing the competitiveness of economic sectors. In the Message of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis, it is noted: "Today, Uzbekistan is moving on to the path of innovative development aimed at fundamentally improving all spheres of life of the state and society. That is why the Ministry of Innovative Development has been created in the country with specific tasks for the development of research and innovation activities ...".

The importance of intensifying innovative activity at building materials enterprises comes from the fact that innovative development is currently the basis for ensuring competitiveness and ensuring the effective implementation of the mission of this industry, which consists in supplying the investment and construction cycle with modern building materials in the proper volume and required quality.

In the industry under consideration, innovation activity directly affects the competitiveness of the industry and directly affects the development of the economy. Qualitatively new materials are being created in the industry, including those based on nanotechnologies, new technologies are being used, new building systems, new machines and equipment are being used, production is being robotized, the BIM system is being used, project management is being used in the implementation of innovative and investment projects, etc. (Mirzanov, 2010).

An analysis of the scientific and technical literature shows that this industry in our country is sufficiently provided with raw materials. Moreover, this potential has not been fully utilized.

Analysis of research in this area confirms that one of the most important factors of the low efficiency of the industry are:

- ✓ organizational and technical backwardness of enterprises both in the sphere of production and in the sphere of management;
- ✓ the inertia of a larger number of enterprises in relation to the use of innovations in terms of the use of new materials and structures;
- ✓ low sensitivity and inadequate response to real observed market changes.
- ✓ As the data show, the activity of innovation activity has decreased almost everywhere at the enterprises of the industry, if we do not take into account systemic innovations covering all sectors of the economy.

Nevertheless, the practice of developed countries such as the USA, Japan, Germany

[2] Statistics. List of countries by GDP per capita. World Bank data [Electronic resource] - Access mode: = https: // Expert/ru

and domestic achievements allow us to conclude that it is necessary and possible to intensify innovation processes in the industry, and, in our opinion, it can be achieved by studying two factors: identifying priority areas for innovation and determination of methods for activating the innovation process.

Analyzing the state of the industry from the standpoint of innovation, it should be noted that, in the end, to this day, the share of manual labor is high in production, there are significant production downtimes, and product quality does not always meet consumer requirements. The materials and technologies used in the construction of objects often reflect a low scientific and technical level.

The growth of transport costs due to the outpacing increase in energy prices did not sufficiently orient enterprises to the widespread use of local raw materials, including agricultural waste for the production of building materials and structures, to replace materials imported into Uzbekistan.

Difficulties in ensuring the growth of the organizational and technological level, of course, first of all, consist in the low solvency and profitability of the industry under study, as well as in the significant high cost of machines and mechanisms used in most industries of the industry, most of which are produced outside of Uzbekistan.

In a number of studies, it is noted, for example, in the monograph of Mirzanov (2010) low personnel potential of the industry.

Based on the analysis of the literature (Kurbaniyazov, 2017) and based on general trends (Igamova, 2021), the current state of the industry and the conditions of its activity, as well as taking into account the priority of certain groups of innovations, we can distinguish the following sequence in the development of innovative activities of the industry:

The development of modern means of communication and information technology in production management, which ensures the efficiency of obtaining information, reducing transport costs, a significant improvement in the management of production processes;

Formation and improvement in medium and large enterprises of marketing services, the main function of which should be to study trends in the product market and ensure an adequate response. It should be noted that in the Republic of Uzbekistan as a whole, the so-called special building systems have not yet been used, when a construction company, having acquired the appropriate patents or developed its own technology, often using the know-how form, builds a certain type of objects (for example, individual houses), while achieving a significant effect due to specialization. It is the search and promotion to the market of such systems for a region with a predominant share of the rural population that can become the object of activity of these marketing structures.

Development of new technologies and materials for the construction of facilities. Here, in our opinion, given the growth of the transport component and dispersed objects, which lead to the fact that up to 60% or more of construction costs are transport costs. It is necessary to give priority to the use of local raw materials, which, given the rather low share of local employment, also provides a solution to social problems. Moreover, it is necessary to take into account in this regard the many proposals of scientists from Uzbekistan on the need for widespread use in construction and, in particular, in rural areas, adobe enclosing structures (pakhsa), which, in many respects and, obviously, economically, are not inferior to structures made of other materials, and in particular burnt bricks. Also promising, in our opinion, is the use of local natural stone in rural construction for foundations, which allows to reduce the consumption of cement by 60-80%, the price of which is significant due to the high energy intensity of production.

More ambitious and significant are the problems of using other types of raw materials, in the form of natural stone (granite, marble, etc.) for the production of facing materials and agricultural waste, since they are associated with the need to attract significant investment. These problems are on a par with the renewal of the fleet of the material and technical base of production.

The presented proposals in the field of innovation take into account the current financial situation and the expected effectiveness of innovation.

It is in connection with this that preference is given to innovations of an organizational nature. Here it is taken into account that for the most part they require relatively small initial and operating costs, and the efficiency per 1 amount of costs, as a rule, is much higher than innovations in the manufacturing sector.

In construction, there is a factor of dispersed objects, the importance of which, as noted earlier, will grow. Therefore, the definition of acceptable areas of operation of enterprises is of great practical interest.

Among the proposed innovations, in terms of the complexity of implementation, one can single out innovations related to the production of new materials and the development of new technologies. The practice of the United States, Western Europe and partly Japan shows that the post-industrial period of development predetermines the need for the use of special organizational management structures aimed at implementing specific innovations (for example, the "product management" or "project management" structures when an economic unit introduces innovations related to product change or technology change. Along with them, other organizational formations are also used, moreover, with the creation of economically separate units in the form of venture firms, whose activity consists in conducting research and in the practical implementation of their results.

Given the need to intensify innovation activity in this industry and the possibility of implementing this direction, we propose the creation of such venture divisions in large and a number of medium-sized enterprises.

In modern conditions, the tasks of these units should cover:

- search and identification of domestic and foreign achievements in the industry in question;
- assessment of the acceptability of promising innovations to the conditions of activity of domestic enterprises, as well as a technical and economic assessment of the effectiveness of innovative projects.
- a detailed study of a specific promising innovation and the development of proposals for your enterprise;
- experimental testing and industrial implementation with subsequent participation in the operation of the innovation.

The form and conditions of their activity may be different. But it seems more expedient to create them on the basis of internal self-sufficiency, and what is fundamentally important, building relationships between venture groups on a contractual basis, providing for the receipt by venture divisions of preferential internal loans and equity participation in profits during the operation of innovations.

5. Conclusions and suggestions.

In general, the creation of economically isolated venture firms with the involvement of qualified and enterprising specialists with the fulfillment of other conditions will, in our opinion, ensure that these structures play a catalytic role in introducing scientific and technological achievements into the activities of enterprises in the industry under consideration.

It should be noted that for the work of these venture divisions, leading employees of educational institutions and scientific institutions can and should be involved in the form of temporary creative teams.

The activities of the proposed venture structures at the initial stages should be focused on the use of domestic developments, which are often undeservedly forgotten. Their attractiveness lies in the fact that they more fully take into account local conditions and characteristics (for example, the characteristics of local raw materials, climate, production opportunities, skill levels, etc.), as well as their greater economic accessibility.

Special attention deserves innovations in the field of creating new industries for the production of materials and structures, as well as those associated with the use of new building technologies, i.e. innovations requiring significant investment.

The most important function in the management of innovation activity is to identify trends in the development of the industry, to identify possible future changes, both in production technology and in products. In this regard, it is worthy of special attention to consider the impact of scientific and technological progress on changing the structure of construction, the structures used.

The availability of such data will allow the enterprises of the industry to raise funds in a timely manner, prepare the production base and, ultimately, carry out an adequate reorientation of activities. A significant manifestation of the transport factor in the industry gives reason to assume, along with the expansion of the use of building materials and structures from local raw materials, the need to produce effective lightweight and

transportable building materials and structures, including the use of lightweight concrete.

Considering the immediate prospects for urbanization and housing construction in cities, it should be noted that multi-story housing construction has unconditional economic advantages (better use of the building area, compactness of communications, the possibility of effectively creating social infrastructure in residential areas, etc.), and can and should retain priority positions. Of course, this will affect the range and structure of the required building materials, products and structures.

Thus, it has been established that the building materials industry in Uzbekistan has a number of features. The analysis shows the need to strengthen the personnel potential of enterprises, make fuller use of raw material potential, pay special attention to resource saving and reduce energy consumption. The activation of innovative activity for the enterprises of the industry is an objective necessity and requires a systematic and integrated approach. The sequence of implementation of innovative development measures should include several stages, starting from the implementation of less capital-intensive, but highly effective organizational and managerial innovation projects (for example, the use of modern ICT), continuing the implementation of resource saving projects with a subsequent transition to projects for the production of products based on higher modern technologies. The choice of projects should be adequate to the changing needs of consumers - enterprises engaged in capital construction.

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