Globalization of energy saving problems and identifying of the ways of solving them in investment - building complex

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Abstract. In the context of sustainable development of the construction industry the article gives the strategic objectives of scientific and technological progress and innovation in the field of energy conservation. The main criteria for sustainable development are limit consumption of natural resources and protection of the human environment. In this regard, the development of programs for efficient use of energy resources is a major national, energy, economic and environmental problem.

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Introduction

Human activities of satisfying vital needs have been aimed on removing of natural resources for millennia. More than 60 % of the natural ecosystems of our planet have already been changed by technological impact and unfavorable habitat affects the lives of every third person of it [1]. According to specialists, the human pressure on the whole environment is doubling every 10-15 years. In many regions of Russia, there is an unfavorable ecological situation: cases of forest fires, poaching, unfounded attacks on reserves, nature sanctuaries and other protected areas have become more often, gradation of many rivers is continuing. There is a threat of ecological terrorism. Some developing countries are seeking to place a variety of production and hazardous waste on the territory of our country [2, 3] On the whole, state of the environment in Russia is quite difficult.

The main part

Increasing anthropogenic load on the environment shows that the task of identifying ways to sustainable socio - economic development of the world community on the basis of a wider application of new advances in science and technology and joint efforts of all the countries in this direction are fundamental. The main criteria for sustainable development are limit consumption of natural resources and protection of the human environment. [4]

To ensure its sustainable development the Russian economy needs modernization of the national economy and the transition to innovative forms of management by creating not only the overall institutional environment for the development of the innovation process and a favorable investment climate, but also an impact acting on the implementation of individual projects and energy efficiency programs, providing support to socially significant projects, which would not have been implemented by the private sector in opposite conditions. [5]

In this regard, the development of programs for efficient use of energy resources is currently considered by technically developed countries of the world community to be the most important national, energy, economic and environmental problem. The energy crisis of the 80s of the last century stimulated the adoption of a number of fundamental directive, regulatory and information documents aimed at the development of comprehensive energy conservation programs. It can be seen in the investment-building complex of our country. [6]

Experience of building complex in the conditions of transitive economy shows that there have been significant changes in urban planning, economic and technological policy. Rapid growth of cities with placing of large industrial complexes there and using of large surrounding rural areas for residential buildings have stopped. Interest-free budget allocation and free allocation of land plots for construction are in the past. Voluntaristic pursuit of the creation of the largest objects in the world has ceased. [7] A shift from a model designing and policy aspirations to prefabrication construction is taking place. Transition from designs with indicators of construction and installation works to the development and implementation of investment and construction projects with indicators of consumer qualities throughout the life cycle of objects created is carrying out on a large scale.

These and other changes in operating conditions of the building complex of Russia are mainly the result of political, economic and social transformations which are taking place in the country and accompanied by both positive and many negative effects and consequences.

Among the negative factors caused by processes occurring during the transition period are:

- a sharp decline in investment in capital construction;
- growth of customers' debts to contractors and sub- contractors' debts to suppliers of resources;
- sharp rise in the value of finished construction products ;
- reducing of the effectiveness of the quality control and reliability of projects under construction;
- lag in the development of legislative base and regulative and methodological support;
- the absence of sufficiently reliable information for supplying of investment-construction complex participants.

Thus, the essential feature of the present moment is the presence of two trends. On the one hand, there is a process of decline and deterioration in the economic situation of many enterprises. On the other, the process of reforming and restructuring, which is based on the development and implementation of programs to overcome the crisis, is increasing.

A set of organizational, economic and legislative measures must be taken for successful completion of the investment and construction programs and tasks dealing with it. Strategic priorities of the construction sector for the period until 2020 are the following [8].

1. In the field of urban development. Strategic direction of urban development in the coming period is to streamline the state of Russian cities, i.e. to restore historic appearance of cities, to find the initial factors and identify the current city-forming ones, to draw prospects of development of each city, with a focus on resources and completing construction, on the harmonization of the urban environment, on achievement of a balanced state of housing stock, number of jobs and job training, capacity of social, engineering and transport infrastructure, on restoring and maintaining the ecological equilibrium in a position to the natural environment.

Complex reconstruction of existing buildings will be a priority of urban development. It will probably be done through demolition and replacement of dilapidated buildings with modern structures, reconstruction of residential buildings of the first series of mass production of housing, and then reconstruction of neighborhoods and districts with large-panel houses of all the series, reconstruction of social facilities and sealing of industrial buildings and transport infrastructure, restoration of natural components of urban environment.

Ideology and concept of further long-term development of each city should focus on human needs. Unlike the dominant role of" production sphere» of the preceding period the main focus of nowadays is on the development of housing, welfare, cultural and humanitarian spheres of the urban environment.

2. In the area of housing. The elimination of housing crisis in the country should be a strategic goal in this branch of investment -building complex. If the information, that it's available on the average 18 square meters of living space per person at the present time in Russia, is reliable, then it's necessary to bring this figure to at least 24 square meters, which implies 1.0 billion square meters increase in housing for the next period. It is also necessary to reconstruct approximately the same amount of housing built in the 1940-1960 -ies.

In the future, qualitative changes of houses which are being built and reconstructed should undergo. First of all, we need to make the transition to the design and construction of energy efficient buildings with environmentally friendly materials and designs. The volume of construction of private family residential houses in suburban areas and in the countryside should increase to 50 percent or more. The transition from panel types of housing to industrial construction of houses on individual projects should be done in the first decades of the XXI century. In the cities, mostly new houses of high suitability will be build.

3. In the field of industrial engineering. Construction of oil and gas complex, new roads and railways and improvement of existing transport networks of social and engineering infrastructure will be increased in the future.

4. In the field of conservation, renovation and life extension of existing assets. Improving of the reliability of existing buildings and structures in seismic zones, as well as in areas that emerged in recent years with extraordinary natural and anthropogenic influences, is planned.

5. In the area of construction base development, production of building materials and construction industry. Reconstruction and modernization of production base of construction project in each region and the city should be performed paying attention to supply with durable, up-to-date building materials, products and structures, including the modernization of production of large-panel houses. The capacity of these measures should be used for the manufacture of interior finishing

products of residential buildings, taking into account energy-saving technologies.

A number of enterprises producing refractory and biostable effective heaters, weatherproof materials for building facades, as well as other kinds of modern, environmentally friendly, energy efficient, effective building materials, especially based on the processing of secondary resources is to increase.

6. Ecological rehabilitation of the environment. Creating universal technologies, businesses and industries for processing, as well as recycling and waste burying ¬ production and economic activity.

7. In the field of economics and management. Formation of effective mechanisms to increase the effectiveness of research, to attract more extrabudgetary sources of funding for research, to accelerate the introduction of scientific and technical progress, to ensure competitiveness in the domestic and international markets through the establishment of regional and sectoral funds of technology development and promotion of small forms in science and technology due to contributions from the profits of enterprises, as well as other sources of funding, inclusion of organizations costs on scientific and technical developments, the introduction of new techniques, technologies, innovation in the cost of construction products, support of small research organizations at the regional and local level by introducing preferential local tax system development of competitive relations and forms of contracts between the participants of the investment sphere, aimed at the final results and the distribution of profits from share scientific and technological activities.

Implementation of these measures on preparation of the building complex to implement complex and challenging tasks should be based on systematic use of scientific and technological progress and innovational activities.

Strategic objectives of scientific and technological progress and innovation in the construction industry are: to increase the quality of construction products, to ensure high consumer characteristics of buildings, their reliability, safety, functional and aesthetic comfort and operating economy,to transform the architectural and construction protection of human life and its future development to a level corresponding to modern advances in this area of social and technically well-developed countries.

To achieve these objectives it is necessary to decide a complex of scientific and technical problems in the near future, such as: [8]

- double reducing of energy consumption for heating buildings and structures in the housing sector and in the industrial sector, including 20% due to the use of alternative energy sources;

- reducing the weight of constructions, products, materials, buildings and structures and, consequently, reducing of transport costs by a quarter;

- substitution of 20 - 30% of mineral raw materials by man-made materials in the manufacture of concrete, ceramic products and some other types of building materials with a significant reduction of their cost ;

- introducing the output of a new generation of high-quality building materials and products, including composites, exclusion of more expensive imported materials of similar purpose from the market of resources;

-technical supplying of qualified construction workers with modern equipment of domestic production in order to increase their productivity in two or more times;

-development of production of a sufficient amount of modern stop and control valves, engineering systems for heat, water, gas and electricity and exclusion due to them wastage of heat, water and electricity at one-third ;

-development of project documentation and the transition to large-scale construction of residential, public and industrial comfortable, environmentally friendly and energy-efficient buildings of the new generation, which implemented the listed objectives of scientific and technical progress.

Academician of RAASN (Russian Academy of Architecture and Construction Sciences) S.N. Bulgakov [8, 9] considers that the available scientific and artistic, scientific and technical (modernized) reserves are sufficient in general to resolve urgent problems in the field of architecture, urban planning, construction, reconstruction and efficient operation of buildings and structures erected for the entire period of their life cycle. These reserves should be used for solving specific issues: to align the network structure of research organizations and other entities, to determine the forms of permanent and adequate funding of scientific research and develop appropriate legal and organizational regulations.

Formation of a more flexible management system of innovation processes in the construction industry and new economic mechanism aimed at creating promising products, conversion of organizational forms and management functions activate the creation and implementation of innovations and enable management through innovative process from idea to implementation. This mechanism provides that the elements of the system, which is engaged in the development and implementation of technical policy and management innovation, are located at different levels of the

management structure and there is a well-established structure of cooperation and coordination between them.

The organizational structure of innovation management in the construction industry is obliged to guarantee the functioning of two complementary systems – strategic system on improvement and development of future scientific and technological capabilities and operational system on deployment of existing [10]. For this we need to develop and implement the program, paying attention to and concentrating funds on the following components [9]:

- preservation of existing intellectual potential of construction complex to form a database of information about all the scientists, authors, patents, inventions, exclusive projects ;
- over the next decade implementation of targeted programs for training of 1000 young scientists, including 300 doctors and 700 candidates of science on the necessary perspective for building complex function under the auspices of RAASN;
- creation of the information database of the available scientific and technical potential of the research institutes, design departments, universities, research laboratories, etc. ;
- purposeful, systematic updating of scientific and technical basis of scientific organizations ;
- formation of constantly expanding and dynamic functioning Demonstration and Information Research and Training Center of domestic and foreign architectural innovations (Academpark) as a part of existing exhibits - the main types of buildings and structures for different purposes, advanced samples of building materials, products, design and engineering systems, machinery and modern systems of training, information, marketing and engineering studies.

Scientific innovation can take many forms, if several entities are involved with general scientific information, design activities through targeted research and innovation program or a research and innovation project. [11]

It is very important to develop innovation strategy and measures for its implementation in the innovation policy of the company. Currently, unified scientific and technical complexes, combining research and production processes, are formed in the largest firms This suggests a close relationship of all stages of the "science - production" cycle. Building of holistic scientific production and marketing systems is objectively naturally due to scientific and technical progress and the needs of the market orientation of the firm.

Conclusion

Building complex of the country should be shifted to a modern higher level of energy-saving base technology for sustainable development and environmental security of the Russian Federation; work on improving the competitiveness of the construction products in the domestic and foreign markets based on the use of brand new high-end technologies and materials should be done; manufacturers of tech products should be aimed on satisfaction of social and spiritual needs of the population.

Saving tasks are likely to have long-term character and take into account the interests of several generations hence conceptual solutions to optimize intertemporal allocation of scarce resources and safeguarding the interests of different generations are getting great importance.

Implementation of the concept of sustainable economic development dictates the use of appropriate tools, which is the actual innovation in the field of energy conservation, as well as accompanying innovative products, services, technologies - from production to management.

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References

1. Rekitar, Y.A., 2000. Topical issues of investment policy and problems of resource. Building materials, equipment, technologies of XXI century, 7: 21-25.
2. Petrov, A.V., 2009. "Globalization" of the economy: social and political aspects. St. Petersburg: St. Petersburg University Press.
3. Huntington, S., 2005. The Clash of Civilizations. Moscow: AST, 603 p.
4. Sustaining the nations innovation ecosystems: information technology for manufacturing and competitiveness. Report of the PCAST. Wash., 2004. Outlook on science policy, March: 27-28.
5. Kopeikina, L., 2008. Ecosystem for innovative business. The Angel Investor, January: 10-13.
6. Glazyev, S., 2011. On an alternative system of public policies of modernization of the domestic economy (economy section offers scientists the Department of Social Sciences of the Russian Academy of Sciences). Russian economic journal, 4.

7. Kleiner, G., 2011. System Resource of Economics. Problems of Economics, 1: 89-100.
8. Bulgakov, S.N., 1998. Technological innovations in investment and construction complex. Moscow: Publishing house RAASN, 547 p.
9. Bulgakov, S.N., 2001. Conceptual positions, goals, direction and development forecasts of investment and construction sector of the country and its scientific potential for the period up to 2020. Herald Building Sciences Branch. Moscow: RAASN. Vol. 4. pp. 3-11.
10. Chesbrough, H., 2006. Open Innovation: A New Paradigm for Understanding Industrial Innovation. Oxford: Oxford University Press.
11. Porter, M.E., 2002. National Innovative Capacity. Scott S., Porter M.E. (eds). Washington (DC): Council on Competitiveness.

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