
GREEN PROJECT MANAGEMENT OF GREEN BUILDING IN THE ARCTIC

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Ecological construction accompanies any economic or other human activity, so environmental aspects of management such projects are keys to the territorial development in Arctic region. The article deals with analysis of standards of the “green” building and the “green” project management as the strategy of the transmission of the best practices for the environmental teams of the building projects.

Key words: energy-saving technologies, environmental construction, green project management, Arctic.

Introduction. Spatial development of the Arctic regions with the use of sustainable construction technologies is essential for the economic development of Russia's transition to a green economy, environmental security and sustainable development of the territories [1—3]. This problem with special attention to the legislative level. Prime Minister D.A. Medvedev strengthening of the foundations of the state policy in the field of environmental development of Russia until 2030 emphasizes the importance of the problem and the development and implementation of effective and innovative technologies allocates priority. According to Russian President Vladimir Putin: “The basic task of all Arctic states becomes widespread use of energy-efficient, smart, breakthrough technologies capable of working in harmony with nature”.

Application of a green project management in environmental construction projects need for reaching a new stage of development of the construction industry, which requires large-scale introduction of energy-saving technologies, technologies and principles of environmental project management, innovative spatial planning, as on the Arctic territories as and in all Russia [2; 4].

Any constructions projects interact with the environment depend on its constraints and opportunities; however, as well human values affect the objectives of the projects in the Arctic. It is time to ecological construction projects forming or restoring the environment. The strategic goal of sustainable construction in the Arctic regions is the transition to closed-loop project, when the external environment does not change, no emissions and no discharges, and waste production and consumption are completely processed. This utopian goal setting, such projects more expensive, but the assessment of the real cost of ownership shows their breakeven point [4].

In foreign countries, green building is growing rapidly. Innovative green building technologies are developed and implemented. In many countries, their national green standards exist. Green Standards are a tool for the implementation of sustainable development principles in the building industry, which allows you to assess the level of environmental efficiency, technical equipment and property management processes. Conformity with environmental standards assessment of buildings is given in accordance with these standards.

The object and subject of research. Subject of research were environmental criteria standards. The object of research were green building standards, GPM, GRI, ESPM, ISO 14000, the 10 principles of the UN Global Compact.

We have carried out analysis of the national green building standards 7 countries: Taiwan (EEWH, 1998), Germany (DGNB, 2009), Japan (CASBEE, 2002), Canada (NABERS, 2001), Finland (PromiseE, 2003), the U.S. (LEED, 1992), Russia (GOST № 54954-2012, 2012).

For the analysis of best practices green project management for the green building have been used 4 national standard green building (LEED, BREEAM, DGNB, GOST № 54954-2012), as well as ISO 14000, GPM, GRI, Global and ESPM UN treaty on 10 principles.

Methodology. Green standards analysis was conducted using the methodological principles and logical-graphic methods. Methodology of the study was in sequential analysis from the international standards to national standards and from the intragroup comparisons of the environmental competencies to intergroup comparisons environmental competencies.

Green Building as an indispensable element of sustainable territory development. We compiled logical-pictorial diagram of functional areas that determine the activities of project management of green building, as a result of the review of national standards in Germany (DGNB), USA (LEED), Russia (GOST № 54954-2012) (Fig. 1).

Analysis of standards has allowed to allocate seven clusters of green building, which significantly have an impact on operation of the facilities built by green technology. Choice of the criteria is typical for all standards aimed at conserving of the natural resources, reducing of the anthropogenic loads on the environment, improvements of the indoor environment of buildings. Substantial differences are expressed in the more strict requirements to such criteria as “Project Management”. For example, in the Canadian standard (NABERS) and Taiwan standard (EEWH) is ignored an integrated network management and a monitoring of the design process, construction and maintenance of buildings. Economic aspect of green building is affected only in the standard DGNB (Germany) wherein the depth analysis and the assessment of the economic criteria of the environment and energy efficiency (life-cycle cost of the building).

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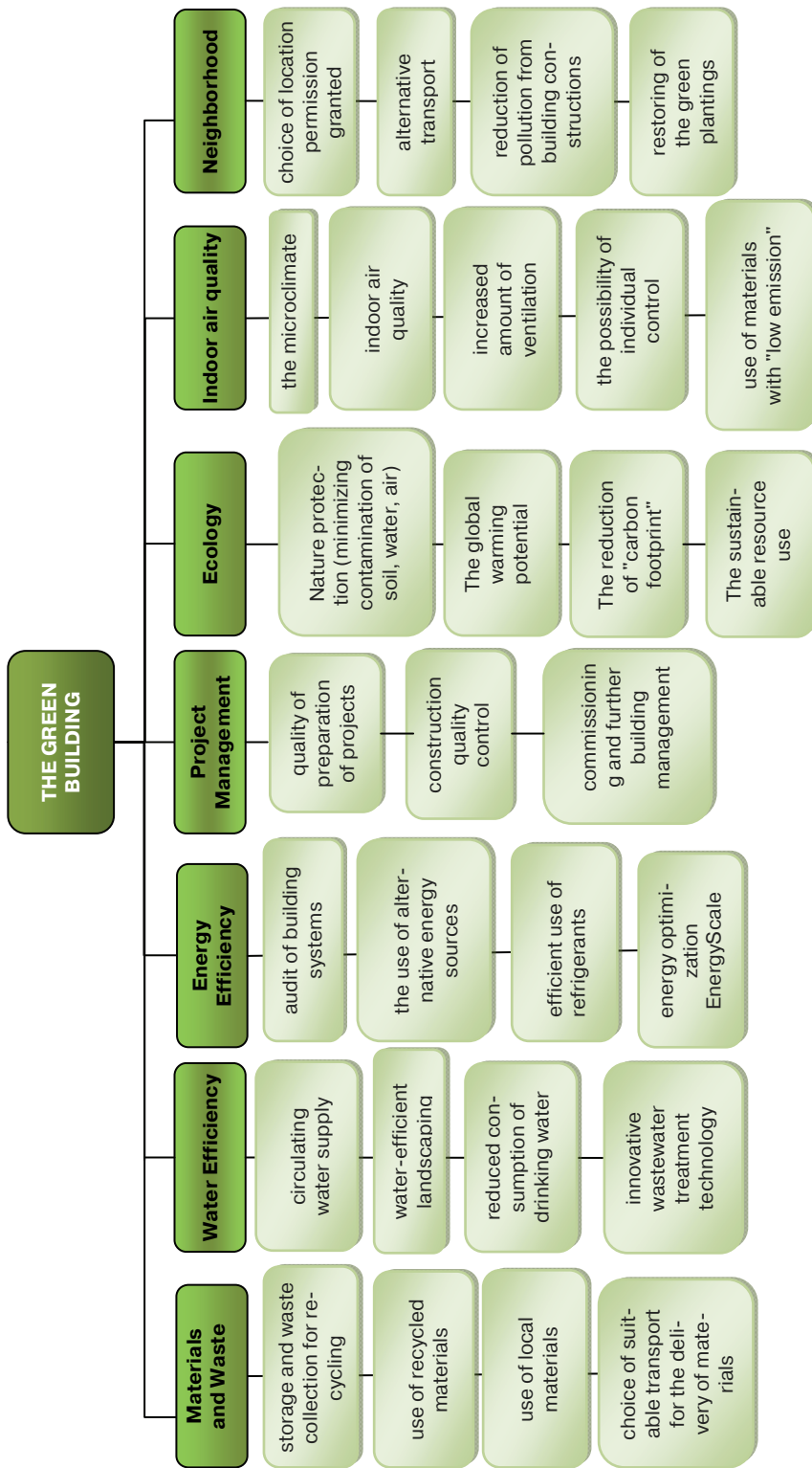


Fig. 1. Logical pictorial diagram of functional areas that determine the activities of project management of green building (according to the standards DGNB, LEED, Russia)

Section “Project Management” includes an integrated network management and a monitoring of the design process, construction and operation of buildings. Effectiveness of construction activity is largely dependent on the quality of the project. Criterion “Environmental Management” of national standards (GOST № 54954-2012) is aimed to implementation of environmental measures on the lifecycle of the real estate object; implementation of measures to prevent the effects of natural hazards; implementation of measures landscaped arrangement plan; implementation of measures stormwater management plan; citizen participation in the implementation of development plans and provide citizens reliable information about these plans; participation of qualified specialists in the design and construction.

Section “Materials and Waste” includes the organization of centralized waste collection on various types and its subsequent processing, recycling of construction waste, the use of recycled materials at the facilities, as well as the use of regional materials and others. Section “Energy Efficiency” means ensuring minimum energy consumption through the use of the energy-saving measures in engineering systems, the use of the alternative energy sources, perform calculations of the energy consumption for further control and monitoring of the service operation of the facility and others. The section “Water Efficiency” includes water treatment and reuse, the use of water-saving equipment (installation flow limiter); water-efficient landscaping involves reducing consumption of potable water used for irrigation (landing on the territory of the plot of plants that require minimal water use, the use of “rain-resource”), etc. Section “Neighborhood” includes system of activities aimed at protecting of the soil from erosion, (device geogrids, tree trunks lattices), a ban on the development of environmentally valuable land, restoring of the green plantings, reducing of the heat load on the solid surfaces developed areas and etc. Section “indoor air quality” includes the use of materials with “low emission”, activities to reduce the impact of pollution sources on the quality of the internal microclimate (installation on all supply and exhaust filter system, etc.); systems design mechanical and natural ventilation to meet requirements of normative documents or exceeds their; monitoring of outdoor air (CO₂ sensor installation for areas with mechanical ventilation), etc. One of the important topics is “Ecology”, which addresses the risks to the local environment, sustainable use of resources, ozone depletion potential, the demand for non-renewable primary energy, etc.

Implementation of the environmental procedures in project management standards in Russian ecological construction solves the problem managing expectations of stakeholders in environmental constructional projects, offers the prospect of optimizing important parameters such construction projects as robustness, reliability, integrated security, economic efficiency, innovation, etc. Application of the standards of “green” project management in ecological construction in the Arctic contributes to greening of real estate management processes to ensure cost effectiveness and environmental safety Arctic projects, reduce the negative impact of the construction industry on the environment and, consequently, increase population life quality in the Arctic regions.

Logico-graphical analysis of standards “green” building, “green” project management and environmental principles of international cooperation revealed succession, both in special and in supranational standards. However, analysis of the continuity of eco-

logical principles of the UN Global Compact 10 principles in environmental management of production (2) showed no criterion of economic sustainability; standards GPM (1) — the lack of criteria for transport and energy; standards in “green” construction (3) — to match the basic criteria (Fig. 2).



Fig. 2. The logic circuit of succession of ecological principles of international cooperation in the national environmental standards for project management, production in the construction industry:

1, 2, 3—10 the area of succession principles and the principles of sustainable development in “green” project management (GPM), environmental management (EM) and green building standards (GBS), respectively; 4, 5 — in the area competency standards GPM, EM, GBS, respectively; 6 — area of succession EM and GPM

The role of the GPM in the system of green building standards and environmental management (4, 5) in the construction industry today does not have unique solution because of the newness of direction [7]. Intergroup analysis of environmental competency of standards GPM and EM showed them the main difference: in the field of green project management describes the critical path and the structure of the list of works on operational and environmental management the company — planning, organizing, staffing personnel, fulfillment of tasks and management by the acting enterprise [7]. Both of these standards (GPM, EM) overlaps with that of knowledge of green building of standards (4, 6) in the area of government contracting, environmental consulting, audit and examination.

Competence in the field of green project management and management of environmental projects are important for environmental green building project teams. Submission of projects on ecological functions in green project management environmental rod form the, combining green building standards and environmental management and make their

own logical framework project management of green building, including environmental design, value engineering environmental costs and benefits, managing federal and regional target programs in construction industry, is performed in real time.

The principal novelty of the “green” project management lies in the fact that the preservation or restoration of the natural environment becomes mandatory condition for the success of any construction project:

1) Consistently implemented a systematic approach to solving production problems, taking into account environmental constraints;

2) Introduce the concept of integrated environmental management of the project including PEB questions and CP in the concept of total quality management (TQM — Total Quality Management) and Integrated Risk Management (ERM — Enterprise Risk Management);

3) Suitable sample project management tools based on best practices, such as TCM AACE, PMBOK PMI, ICB IPMA, PRINCE, P2M PMAJ, ESPM, expansion ESPM for environmental projects, FERMA, ISO 21500, ISO 9000, ISO 14000, etc.;

4) Changes in the management of major construction projects to ensure environmental safety, health and protection of the population provide flexible control procedures and regulatory and methodological support in their implementation at all stages and areas of “green” building projects.

The main impediments to the development of ecological construction in Russia are: lack of regulatory framework to build on innovative technologies; lack of awareness of the possibilities of modern consumers energy-saving technologies; relatively low prices for electricity and heat are investing in energy-saving and environmental protection technology unpromising for consumers. For Arctic territories to date there are no standards of sustainable construction, they need to be large-scale development and implementation, as well as use in the Arctic environmental building technologies have been successfully applied in the northern territories abroad.

Conclusion. Thus, the response to today’s environmental and economic challenges should be the development and implementation of a fundamentally new, single, comprehensive approach to the implementation of environmental management of ecological construction projects based on open standards, national, systematic mapping and positioning Targeting the Russian Federation and CIS countries in the geopolitical and civilizational space, sustainable development, the competitive space of the global economy. Application of the principles and techniques of ecological project management and environmental construction for sustainable development in the Arctic is the only opportunity to further its development as Russia and other countries, as the experience can be transferred to other regions of the world which facing rapid changes of the environmental.

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ЭКОЛОГИЧЕСКИЕ АСПЕКТЫ УПРАВЛЕНИЯ ПРОЕКТАМИ ЭКОЛОГИЧЕСКОГО СТРОИТЕЛЬСТВА В АРКТИКЕ

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Экологическое строительство сопровождает любую хозяйственную или иную деятельность человека и поэтому экологические аспекты управления такими проектами являются ключевыми в пространственном развитии арктических территорий. В статье дан анализ стандартов «зеленого» строительства и «зеленого» проектного менеджмента как стратегии передачи лучшего опыта экологическим командам строительных проектов.

Ключевые слова: энерго- и ресурсосберегающие технологии, экологическое строительство, «зеленый» проектный менеджмент, Арктика.