Global and regional aspects of sustainable design in the frame of innovative technologies

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Abstract. Nowadays environmental problems of our planet are becoming the most important issue in all spheres of our lives. Development of new energy effective materials, using ecologically friendly materials in architecture and construction place a great role in reducing consumption of non-renewable resources. Relevance of the study can be taken into consideration by the investigation in the evolution and tendency of sustainable design. In this article, the concept, main purpose and principles of sustainable design with the relevant examples are given. The authors analyze general requirements for environmental projects and they give interesting solutions of eco issue, historical facts and observations of some ecological standards are also considered.

Introduction
The term “sustainable design” is widely used today both in scientific literature and in everyday design practice. However, sustainable design entered the structure of modern design, having a rather vague conceptual framework and an undeveloped theoretical base. Now, there is a need to create a conceptual apparatus and scientific tools of sustainable design. Then it would be possible to combine disparate knowledge in the field of applied ecology and design by the help of them, to make an integral scientific system from the “mosaic” of individual solutions. During modern political events and economic realities - the priority of the extractive industries, the development of mining capacities, uncontrolled use of natural resources and problems of dumping nuclear and chemical wastes - issues related to the consumption and conservation of the richest in the world, but exhaustible resources of our country are becoming actual. Today there is a task to minimize the impact of human activity on the natural environment, and this problem falls within the scope of design. For many years, changes in nature related to human production activities were not only not included in the sphere of “interests” of designers and architects, they did not find a response even in nature management organizations and organizations dealing with production issues.

Perspectives of the sustainable design development in global and regional scale.
“Two important circumstances make the continued existence of an industrial civilization impossible. First: "the struggle with nature" has reached a critical point. The biosphere simply will not endure
further offensive industry. Secondly, we cannot continue to spend without limits non-renewable energy resources, which until now have been the main part of the subsidies for industrial development. These facts do not mean the decline of a technological society or the end of energy. It means that in the future, technical progress will be different in building its relationship with the environment. Industrial countries are destined to undergo energy crises from time to time until new sources of energy are created. The transition to new types of energy will accelerate social and political transformations” [1]. Natural changes are obvious. Scientists agree that without taking urgent measures, nature will be destroyed. Humanity, if it does not disappear, will come to inevitable barbarization. Today we are looking for solutions of the crisis. Lots of things has been done, lots of things remains to be done. Now we are at the beginning of the search way, the right way of development. “Undoubtedly, the contradiction between the desire for rampant growth and the limited resources of the land will eventually be resolved one way or another. But no one can predict how this will happen and whether it will be possible to achieve this without cataclysms and catastrophes.”

“Awareness of the environmental threat is inevitable, the issue is in the evolutionary or revolutionary restructuring of our society” [2, p.7-11]. Since 1957, when the foundations of the general European legislation in the field of ecology were laid, environmental law, environmental technologies, and environmental management have constantly developed. This trend continued development and it was reflected in the documents adopted by the UN Conference on Environment and Development. In 1992, the Declaration of Principles and "Agenda 21", in 1998 of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Convention entered into force on October 30, 2001, Russia did not sign the Convention) [3]. These and other events enabled the development of environmental trends, designated by us as an environmental design [4, p.50]. The reports of the European Union in recent years speak about positive dynamics in the field of ecology. The loss of petroleum products during production has decreased. Quotas for the extraction of wood, coal and biotic resources have been introduced and they are in effect. Measures for limitation of harmful gases emissions and gases emitted during production are taken place. Programs for the disposal and recycling of solid household waste are developed actively. In the conditions of a "changing world", when environmental policy largely determines the development ways of European countries, sustainable design acquires the significance that it is destined to acquire in the course of "big changes". Today you can hear about such a guarantor of "private law" as the United States, that the system shifts from the "right of one" to the "right of majority". Such dynamics, involving the development of environmental and social programs, erasing borders between countries, consolidating efforts which are aimed at elimination of common environmental threats, strict and precise regulation, subject to a specific, common, task. The term “Ecological socialism” was first used (the concept introduced by the “green” and left-wing socialists of Austria, Germany) in the 1970s – 1980s [5]. The overall environmental threat is many-sided and manifests itself as a form of military conflicts, economic shocks, natural disasters, but the root is one — the approach of a milestone when the planet will not cope with the load that man has placed on it. Thus, traditional capitalist relations, which do not take into account the needs of a global scale, cannot be the highest point in the development of society [6]. For Europe and America, sustainable design is becoming increasingly necessary. Its development is natural, as it is a response to environmental threats that threaten the very existence of statehood and all modern institutions. So, along with the "world of excessive production and consumption", there is a direction opposite to this, this direction can be called as "the world of true needs." In order to understand how sustainable design will be developed in the future, we can mentally go back in time and understand how accurately scientists have predicted the development of society in general and material culture in particular. We can see the moments that have already occurred, and which may occur in the future.

Alvin Toffler gave an accurate forecast in the 1970s, when companies such as Texas Instruments, Salarex, Energy Conicrision Devices were just on the verge of discoveries in the field of alternative energy. Toffler predicted that energy, linking these processes with the exhaustion of natural
resources. Today, we are still waiting for these technologies to be improved.

“As soon as we begin to combine numerous new technologies, the possibility of choosing more powerful (technologies) will increase exponentially and we will significantly accelerate the creation of an energy base”... waves (of industrial society) and introduce a “metabolic” system that excludes losses and pollution and ensures “continuity”. The production of primary and secondary products of each industry becomes the basis for the following. As a result, a system is formed, in which nothing is produced that cannot serve as the basis for the production of another product, and so on.” [1].

The vision of Toffler echoes what W. Morris wrote at the end of the 19th century. This concerns, the departure from mass production, the roll in the direction of individual production. If Morris in the book "News from nowhere" focuses on handicraft production, then Toffler develops the theme and talks about high-tech production of things created in a single copy and strict compliance with the requirements of the user. By the way, the machine, according to Toffler's forecast, only helps to create an object, a person designs it for himself and programs the machine to create it, while he himself determines his degree of participation in the production process.

Toffler, as well as Aurelio Peccei, sees the future in reducing the lineup of many products. Cars may have a limited range for ease of maintenance and repair. Today some “predictions” of Toffler have become a reality, we have an electronic “substitute” for the secretary, in the form of a home computer. According to the “third wave” theory (the theory of transition from the world of things to the world of information and technology), the appearance of a remote control system for a house, a screen instead of paper, and much more, naturally, could only be surmised in the 70s [1].

Fuller saw the future in the application of simple structures that provide the maximum “benefit” with a minimum of energy and materials. A new functional approach, the adoption of the most verified decisions - this is a new step in design. It is not so important what forms the objects of design will take, the very principle of design is important. The future described by theorists and practitioners of design is heterogeneous. Some authors describe the cities of the future, other features of building a society, informational opportunities that await us, but everything goes into a fairly clear-cut scheme.

Speaking about the future of sustainable design in our country and abroad, we can assume that it will develop over time in one form or another, prevailing over the “purely commercial” forms of design creativity. This will probably be connected with an awareness of the environmental threat, at worst, with a more pronounced manifestation of environmental degradation. Today handicraft production is flourishing. Such countries as Malaysia, India, Indonesia in large quantities supply handicraft products to European markets. There is no doubt that interest in local original forms of objective creativity will grow rapidly. Thus, environmental design operates with accumulated knowledge of traditional subject culture. In the future, traditional construction techniques can be used, the traditions of applied art will be integrated into new forms of object creativity. The techniques of visual, tactile, audio communication of a person with the natural environment, characteristic of folk art, will survive a new rise. An increasing influence on the structure of modern design is provided by environmental technologies. Machines, performing the role of a link between nature and man. The object which is organically existing in the environment, will indeed become a “second nature” [7, vol.23, p.51,524]. We are on the verge of mass introduction of alternative energy, designers can no longer use the “old schemes”, the work on creating the “image” or “style” of the object will be revised. We will experience the birth of new forms, with new laws of shaping. The semantics of the object will inevitably change, the function will pass through the whole chain of existence of the object, using it before production, during operation and after it.

New understanding of bionics will manifest itself in the search for new technological solutions. The techniques used earlier were private; now bionics is revealed to us as the science of connections. The bionic form in objective creativity always accompanied the person, but now we are given the opportunity to understand bionics as a structure, with its diversity and logic. We begin to imitate natural processes not at the product level, entire cities are already built on the principle of ecosystems. The ecosystem becomes the prototype of the enterprises and in the future these processes
are likely to only develop.

Perhaps the most important thing that happens with sustainable design is that it penetrates into not only design workshops and production, design becomes a part of all social and political processes. Ecology, in particular preventive, becomes a thread linking the interests of different countries. Environmental projects today are complex solutions covering many areas of project activity. We do not undertake to assess how our local legislation meets today's requirements, one thing is clear, environmental programs in our country have a rather vague framework. The initiatives proposed and submitted for discussion are local in nature and relate mainly to accumulated damage. We see a gap between the pace of environmental development in the west, and the "passive" regional ecological model. Along with the growing capacities of extraction and production of raw materials, our country is a huge sales market, not regulated market, "producing" a huge amount of waste. Many things are written about sustainable development, ecology, resource saving. Unfortunately, this does not affect the real state of things. Unlike their British counterparts, local producers of petroleum products, large construction companies do not conduct research in the field of alternative energy. The development of sustainable design does not depend on the political and economic situation. The only thing that can happen is a later awareness of the losses that we will incur in the environment. People may not be ready for a new world reality. Resource depletion and the lack of readiness to maintain a social and technical level can roll back us decades ago.

Nevertheless, there is a huge potential for development, a unique experience of stable relations between man and the natural environment. In our culture was originally laid the natural component, which manifested itself in the images of the objective world. Not only techniques, but the spirit, the feeling of the unity of man and nature make it possible to create design products that meet the spiritual and material needs of man. Often, design developments have the character of shocking, nostalgic notes in the design of recent years are also considered by us as the beginning of movement towards sustainable design. Environmental design in our motherland in the near future is likely to be more emotional, intuitive, and will manifest itself at the intersection of design and applied art. Most likely, sustainable design in our country will not be able to avoid changes and will flow into the mainstream of global trends.

Summary
In this article, contradiction between the modern practice of industrial production and sustainable design is described. The idea of a comprehensive, social project culture, originated in the midst of increasing rates of industrial expansion, in the light of environmental changes, takes on new forms. Social design in its broadest sense is the most justified form of project activity in the context of environmental degradation processes. The experience of domestic designers is a base that allows to solve the problem of a holistic approach to design in the face of a growing human conflict with the environment. It is highly likely that sustainable design will take all new positions. This will be associated with the introduction of new technologies, energy effective materials, the revival of the traditional principles of the formation of the objective environment, the reinterpretation of the use of natural images in objects of material culture.

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