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The factor of man in modern architecture and building engineering

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Annotation. One of the most important directions for ensuring the sustainable development of society during the modern period of high energy consumption is the rational and efficient use of energy and resources. one of the urgent directions and main tasks of the modern construction industry is the rational use of energy resources in the production of building materials and structures, in the construction and operation of buildings.
Keywords: Energy, modern, development, resource, construction industry, building materials, construction.

In the conditions of the sharply continental climate of the Republic of Uzbekistan, the consumption of operational energy increases, especially due to the use of air coolants in the summer warm season. Experts estimate that a large share of energy consumption corresponds to buildings.
Thus, one of the urgent directions and main tasks of the modern construction industry is the rational use of energy resources in the production of building materials and structures, in the construction and operation of buildings. Within the framework of this, great importance will be paid to the design of energy efficient buildings, including the development of based volumetric-Plan Solutions, their calculation and constructive solutions taking into account the high thermal protection properties of external wall structures, and the selection of rational and energy-efficient systems of heating, hot water supply, ventilation and air conditioning.
Energy efficient buildings have become a real reality of today. If from the 70s of the 20th century such buildings were implemented as separate pilot projects, today the construction of such buildings is carried out in many countries. This was made possible by the renewal of the relevant regulatory documents of construction science and practice in response to the demand of society to save energy resources. According to these documents, the thermal conductivity resistance of external wall structures has been increased several times. This, in turn, has become a powerful factor in promoting the production and widespread use of efficient thermal insulation materials and multi-layer exterior wall structures based on them.
The projects make it possible to conduct an energy audit to assess the effectiveness of the measures developed to reduce energy consumption in the operation of buildings. In addition, if it is determined that the project solutions are not efficient, energy saving options are determined based on the results of the energy audit, long-term energy efficiency programs are developed and energy saving measures are selected depending on their justification periods.
In modern architecture and building engineering, there are a number of separate directions related to improving the living environment of a person, protecting the interests of the future generation and saving energy resources. These areas include: Sustainable Building (buildings that promote sustainable development), Energy-Efficient Building (energy efficient buildings), Intelligent Building (intellectual buildings), Bioclimatic Architecture (bioclimatic architecture), Healthy Building. "Each of these areas includes serious unfinished business and uncertainties and requires long and extensive corporate work by all interested professionals".
Obviously, the rational use of energy resources and attention to the problems of designing energy-efficient buildings will only increase over time. Therefore, in the process of studying literature, it is important not only to familiarize yourself with the international principles of designing such objects, but also to clearly distinguish which of them can be used in the specific climatic,

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Geophysical and economic conditions of the Republic of Uzbekistan, which can not only be ineffective, but also lead to the opposite results.

"The logic of the development of modern architecture is largely the result of the desire for harmony between the natural environment around the building and the internal microclimate of the buildings."

The issue of energy conservation in construction has become a special center of attention since the 70s of the 20th century. One of the main reasons for this was the realization of the need to save energy resources after the world energy crisis of 1974, as well as the creation of an innovative concept of sustainable development and its adoption by developed countries. The development of the first principles of buildings in the field of energy efficiency came about as a result of criticism from the United Nations International Energy Commission (UNDP). Experts who opposed the UNEC had argued that there were huge reserves to improve the thermal efficiency of the buildings. As a result of this, in 1976, BMTXEK developed the basic principle of energy conservation. It stated that"energy resources can be used more efficiently if the implementation of the measures is technically possible, economically justified, and acceptable from an ecological and social point of view".

At the same time, until now, there is a lack of information about scientific methods that should be laid on the basis of the design of modern energy-efficient buildings. The main reasons for the need to reduce energy consumption in the construction industry. Economic crises affecting the world economy are the main reasons for reducing energy consumption in all areas of the vital activity of human society. One of the following is often the cause of the economic crisis:

Energy conservation helps to solve the problem of restoring economies and ensure their further sustainable growth. Energy saving activities can be mainly focused on:

- rational use of energy;
- energy saving mode.

Thus, the essence of energy conservation is to ensure a given level of service with the consumption of less energy at the same level of fuel resource extraction and the allocation of part of it for new energy-using technologies (consumable products of industry and agriculture, the convenience of the living environment, etc.) and thus guarantee an increase in the quality of

The importance of energy saving is due to environmental problems, namely the need to strengthen environmental protection requirements-conserve natural resources and reduce air pollution from fuel combustion emissions. Construction is considered one of the most energy-intensive industries. About 40-45% of the energy produced in the countries of the world is spent on the exmpluation of buildings (heating systems, hot water supply, ventilation, condensing and lighting), as well as the production of building materials, while a large volume of carbon dioxide (CO2) and other contaminants is released. At the same time, the energy conservation policy in construction should be directed primarily to parameters that can ensure a reduction in energy consumption while maintaining optimal favorable conditions in residential and public buildings. With this in mind, the technical and legislative criteria that govern the construction of buildings that are effectively used from energy in a large part of developed countries are developed and valid. European experts today have focused their attention on improving construction facilities and providing construction facilities with these facilities in order to increase energy efficiency. Because in addition to the main task of the relevant criteria and their implementation, it leads to significant advantages in the form of comfort and a healthy microclimate, helps to stimulate the economy, and also creates jobs in the construction industry.

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In Uzbekistan-the continental climate is very hot in summer and cold in winter. In addition, a sharp change in temperature can be observed during the day. These factors indicate that the climate of the region requires a lot of energy consumption. It is important to take into account such aspects when comparing the Republic of Uzbekistan with other countries and implementing new policies in the field of energy efficiency of buildings and structures. And from an economic point of view, Uzbekistan should pay attention to the development of more internal material and human resources, as well as technical and constructive solutions adapted to the requirements of security in relation to landslides that apply to almost the entire territory of the Republic. This can seriously affect the technical solver used during construction and the choice of materials.

The Republic of Uzbekistan has relatively little experience in improving energy efficiency in the construction sector. In addition, specific geographical, economic and climatic conditions have a serious impact on the levels of efficiency and the value of energy resources.

In this regard, scientists and specialists of Uzbekistan in order to achieve significant achievements in the field of improving the energy efficiency of buildings and structures, it is advisable to carry out the analysis of existing meyori documents and construction experience in the region on the basis of harmonization with elements of advanced practices in some European countries, the USA, South Korea, Japan, China and the CIS It is also necessary to update the current regulatory documents taking into account the specifics of the local context, taking into account the results of scientific research carried out in the Republic. It serves to regulate the design and construction of similar objects in the construction industry.

Stages of development of energy-efficient buildings

The original energy efficient buildings were visual and pilot projects. In their creation, the main task of specialists was to seek interconnection and compromise between three concepts: a favorable microclimate of buildings, the maximum use of natural energy sources and energy-optimized elements of buildings. The main architectural-plan and engineering solutions of energy efficient facilities were aimed at a single goal – to ensure a comfortable microclimate in buildings by saving energy resources that are spent on heating, ventilation and conditioning of buildings.

At the first stage of the design of this pilot project, research was carried out and a number of recommendations for the selection of energy-saving measures were developed.

As part of the choice of building shape and orientation, it was determined that when planning rectangular buildings, focusing their long facades on the south and north sides will reduce the heat flow from solar radiation in the summer season, while allowing the use of heat from solar radiation in the winter season when the sun is below the horizon.

Recommendations for saving energy spent on ventilation of buildings included: reducing the volume of external air by creating places for smoking only in specially designated places in buildings, grouping internal areas according to similar functions, replacing external air with recirculating air, cleaning it through an absorption system, correctly organizing air distribution to reduce the need for additional air volumes".

To reduce the energy costs for lighting, the following were recommended: the introduction of an artificial lighting control system depending on the change in the level of lighting, increasing the level of lighting through fences painted in the interior light color, using the selected "working lighting" system.

Such a solution required "limiting" the area of the mirror surface in the building. As a result, a coefficient of 12% for the area of the mirror surface was applied on the Western, Eastern and southern facades.

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